**City of Fort Lupton**

**REGULAR MEETING AGENDA**
Tuesday, February 1, 2022
7:00 PM
130 South McKinley Avenue

**Zo Stieber, Mayor**
Valerie Blackston, Ward 1
Chris Ceretto, Ward 2
Carlos Barron, Ward 3
David Crespin, Ward 1
Claud Hanes, Ward 2
Bruce Fitzgerald, Ward 3

**You may join in person or join remotely by registering at: https://global.gotomeeting.com/join/851983253**

## Pledge of Allegiance

## Call to Order

## Roll Call

**Persons to Address Council** - This portion of the Agenda is provided to allow members of the audience to present comments to the City Council. The City Council may not respond to your comments this evening, rather they may take your comments and suggestions under advisement or your question may be directed to the appropriate staff member for follow-up. Please limit the time of your comments to three (3) minutes - Mayor Stieber

**Executive Session** "To determine positions relative to matters that may be subject to negotiations, develop a strategy for negotiations, and/or instruct negotiators, pursuant to C.R.S. § 24-6-402 (4)(e)." golf course

## Approval of Agenda

## Review of Accounts Payables

**a.** February 1, 2022 Accounts Payable

**Consent Agenda** - Consent Agenda items are considered to be routine and will be enacted by one motion and vote. There will be no separate discussion of Consent Agenda items unless a Councilmember so requests, in which case the item may be removed/moved from the Consent Agenda.

**a.** January 18, 2022 City Council Meeting Minutes

**b.** AM 2022-021 Approving Resolution 2022Rxxx Ratifying the Mayor's Appointment of the Attached List of Candidates (Exhibit "A") to the Corresponding Advisory/Governing Committees for a Term Beginning February 1, 2022 and Ending December 31, 2023

**Public Hearings** - Public Hearings allow members of the audience to present comments and questions to the City Council on the item being presented. Comments and questions may be limited to three (3) minutes- Mayor Stieber

**a.** Memo to Request Continuance of the Sagebrush Apartments Site Plan Public Hearing February 15, 2022

**b.** Memo to Withdraw the SB Weakland Investments Amended Site Plan

**c.** AM 2022-022 Approve a Resolution Accepting the Coyote Creek PUD Filing No. 4 Preliminary Plat

**Action Memorandum**

**a.** AM 2022-023 Approve a Resolution Accepting the Coyote Creek PUD Filing No. 4 Final Plat

**b.** AM 2022-024 Approving the Purchase of a Mower for the Parks Department in the Amount of $20,976.45 Allocated From the General Fund Parks Budget

**c.** AM 2022-025 Approving the Purchase of Microsoft Office 2021 Licenses for an Amount not to Exceed $40,328.00 Allocated from the Information Technology Budget

**d.** AM 2022-026 Approval of a Resolution for the Acceptance of Subdivision Improvements Agreement with Lupton Village Land Developers, LLC, for the Lupton Village Townhomes - Filing No. 3

**e.** AM 2022-027 Approval of a Resolution for the Acceptance of Subdivision Improvements Agreement with Coronado West, LLC, for the Murata Farms - Filing No. 1

**f.** AM 2022-028 Approve Public Works Wastewater Disposal Agreement With Black Diamond Pumping for Disposal of Domestic Wastewater to the City Sanitary Sewer System

**g.** AM 2022-029 Approving an Ordinance Amending Fort Lupton Municipal Code, Chapter 2 Article II, Mayor and City Council, Section 2-26 (a) Regular Meetings of City Council and Enterprise Boards

**h.** AM 2022-030 An Ordinance by the Fort Lupton City Council Acting as the Utility Enterprise Board, Amending Section 13-26 Sewer Rate Schedules, Section 13-136 Water Rate Schedules, Section 13-145 Water Leaks of Chapter 13 Municipal Utilities, of the Fort Lupton Municipal Code

**i.** AM 2022-031 Authorize Appointment of DA Davidson & Co as an Agent and Tender Facilitator for the City of Fort Lupton Effective February 1, 2022, for the Golf Enterprise Fund

**Information Memorandum**

**a.** IM 2022-001 Execution of Design Agreement with DHM Design for Master Plan of Splash Pad

**b.** IM 2022-002 Affidavit for Surrender of State Liqour License for SBM Travel Stop Colorado LLC DBA TJ's Express at 804 Denver Avenue

## Staff Reports

## Mayor/Council Reports

## Future City Events

**a.** Upcoming Events

## Adjourn

| Vendor Number / Payable # | Vendor Name / Payable Type | Post Date | Payment Date / Payable Description | Payment Type | Discount Amount / Discount Amount | Payment Amount / Payable Amount | Number |
|---|---|---|---|---|---|---|---|
| **Bank Code: Golf Course-Golf Course** | | | | | | | |
| 000024 | ACE HARDWARE OF FORT LUPTON | | 01/25/2022 | Regular | 0.00 | 342.08 | 84905 |
| 92306 | Invoice | 12/29/2021 | GOLF-GLOVES-MAINT | | 0.00 | 94.96 | |
| 92314 | Invoice | 12/29/2021 | GOLF-HAMMER-MAINT | | 0.00 | 13.99 | |
| 92470 | Invoice | 01/11/2022 | GOLF-SUPPLIES-MAINT | | 0.00 | 41.98 | |
| 92475 | Invoice | 01/11/2022 | GOLF-TAPE-MAINT | | 0.00 | 12.58 | |
| 92498 | Invoice | 01/13/2022 | GOLF-PAINT BRUSH-MAINT | | 0.00 | 3.95 | |
| 92517 | Invoice | 01/14/2022 | GOLF-TOILET SEAT-MAINT | | 0.00 | 21.99 | |
| 92525 | Invoice | 01/15/2022 | GOLF-TEXTURE/SANDPAPER-PRO SHOP | | 0.00 | 21.58 | |
| 92533 | Invoice | 01/16/2022 | GOLF-PAINT/SEALER-PRO SHOP | | 0.00 | 75.90 | |
| 92547 | Invoice | 01/17/2022 | GOLF-PAINT-PRO SHOP | | 0.00 | 42.74 | |
| 92555 | Invoice | 01/17/2022 | GOLF-BATTERIES/FASTENERS-PRO SHOP | | 0.00 | 12.41 | |
| 000048 | AIRGAS USA LLC | | 01/25/2022 | Regular | 0.00 | 15.73 | 84906 |
| 9985396745 | Invoice | 12/31/2021 | GOLF-CYLINDER RENTAL-MAINT | | 0.00 | 15.73 | |
| 000072 | AMERICAN DRY GOODS | | 01/25/2022 | Regular | 0.00 | 930.86 | 84907 |
| 128849 | Invoice | 01/05/2022 | GOLF-HATS-PRO SHOP | | 0.00 | 358.01 | |
| 128890 | Invoice | 01/12/2022 | GOLF-BEANIES-PRO SHOP | | 0.00 | 286.84 | |
| 128891 | Invoice | 01/12/2022 | GOLF-KNIT BEANIE-PRO SHOP | | 0.00 | 286.01 | |
| 000239 | CITY OF FORT LUPTON | | 01/25/2022 | Regular | 0.00 | 21,383.77 | 84908 |
| FIN2022023 | Invoice | 01/14/2022 | GOLF-PAYROLL EXPENSE 12/25/21-1/7/22 P... | | 0.00 | 21,383.77 | |
| 000307 | COMCAST CABLE COMM, LLC | | 01/25/2022 | Regular | 0.00 | 244.47 | 84909 |
| 0120790 JAN22 | Invoice | 01/06/2022 | GOLF-PHONE/INTERNET-PRO SHOP | | 0.00 | 244.47 | |
| 000461 | FERRELLGAS LP | | 01/25/2022 | Regular | 0.00 | 1,697.04 | 84910 |
| 1117698937 | Invoice | 12/10/2021 | GOLF-PROPANE-MAINT | | 0.00 | 1,697.04 | |
| 002011 | FRONT RANGE LUMBER COMPANY | | 01/25/2022 | Regular | 0.00 | 44.28 | 84911 |
| 16671/2 | Invoice | 01/11/2022 | GOLF-FURRING STRIPS-MAINT | | 0.00 | 44.28 | |
| 002673 | HOWARD HUGHES HOOD CLEANING | | 01/25/2022 | Regular | 0.00 | 400.00 | 84912 |
| 286 | Invoice | 01/13/2022 | GOLF-HOOD CLEANING-PRO SHOP | | 0.00 | 400.00 | |
| 000735 | LL JOHNSON DISTRIBUTING | | 01/25/2022 | Regular | 0.00 | 5,573.76 | 84913 |
| 1140421-00 | Invoice | 01/10/2022 | GOLF-PIPE-MAINT | | 0.00 | 2,832.00 | |
| 1140422-00 | Invoice | 01/10/2022 | GOLF-SOLID PIPE-MAINT | | 0.00 | 2,741.76 | |
| 000862 | O'REILLY AUTO PARTS | | 01/25/2022 | Regular | 0.00 | 81.27 | 84914 |
| 4489-348041 | Invoice | 12/30/2021 | GOLF-VEHICLE MAINTENANCE-MAINT | | 0.00 | 11.28 | |
| 4489-348888 | Invoice | 01/04/2022 | GOLF-EXTRACTOR-MAINT | | 0.00 | 69.99 | |
| 001751 | SPORTS TURF IRRIGATION | | 01/25/2022 | Regular | 0.00 | 1,119.00 | 84915 |
| 0102371-IN | Invoice | 01/06/2022 | GOLF-CONVERSION ASSY-MAINT | | 0.00 | 1,119.00 | |
| 001105 | TOSHIBA FINANCIAL SERVICES | | 01/25/2022 | Regular | 0.00 | 236.90 | 84916 |
| 462979535 | Invoice | 01/14/2022 | GOLF-COPIER LEASE JAN22-PRO SHOP | | 0.00 | 236.90 | |
| 000024 | ACE HARDWARE OF FORT LUPTON | | 02/01/2022 | Regular | 0.00 | 12.18 | 84917 |
| 92661 | Invoice | 01/26/2022 | GOLF-SUPPLIES-PRO SHOP | | 0.00 | 12.18 | |
| 000307 | COMCAST CABLE COMM, LLC | | 02/01/2022 | Regular | 0.00 | 23.76 | 84918 |
| 0025494 FEB22 | Invoice | 01/18/2022 | GOLF-CABLE-PRO SHOP | | 0.00 | 23.76 | |
| 000974 | SAFE SYSTEMS INC | | 02/01/2022 | Regular | 0.00 | 146.00 | 84919 |
| 870192-1061 | Invoice | 01/09/2022 | GOLF-SECURITY SERVICE-PRO SHOP | | 0.00 | 146.00 | |

| Vendor Number / Payable # | Vendor Name / Payable Type | Post Date | Payment Date / Payable Description | Payment Type | Discount Amount / Discount Amount | Payment Amount / Payable Amount | Number |
|---|---|---|---|---|---|---|---|
| 001895 | TERMINIX | | 02/01/2022 | Regular | 0.00 | 143.00 | 84920 |
| 415923046 | Invoice | 01/05/2022 | GOLF-PEST CONTROL-PRO SHOP | | 0.00 | 143.00 | |
| 001224 | XCEL ENERGY-GAS | | 02/01/2022 | Regular | 0.00 | 543.37 | 84921 |
| 764320239 | Invoice | 01/19/2022 | GOLF-GAS SERVICE JAN22-PRO SHOP | | 0.00 | 543.37 | |

**Bank Code Golf Course Summary**

| Payment Type | Payable Count | Payment Count | Discount | Payment |
|---|---|---|---|---|
| Regular Checks | 30 | 17 | 0.00 | 32,937.47 |
| Manual Checks | 0 | 0 | 0.00 | 0.00 |
| Voided Checks | 0 | 0 | 0.00 | 0.00 |
| Bank Drafts | 0 | 0 | 0.00 | 0.00 |
| EFT's | 0 | 0 | 0.00 | 0.00 |
| | **30** | **17** | **0.00** | **32,937.47** |

| Vendor Number / Payable # | Vendor Name / Payable Type | Post Date | Payment Date / Payable Description | Payment Type | Discount Amount / Discount Amount | Payment Amount / Payable Amount | Number |
|---|---|---|---|---|---|---|---|
| **Bank Code: Pooled Cash-Pooled Cash** | | | | | | | |
| 000031 | ADAMSON POLICE PRODUCTS | | 01/25/2022 | Regular | 0.00 | 519.27 | 70915 |
| INV368978 | Invoice | 01/07/2022 | GF-UNIFORMS-PD | | 0.00 | 183.90 | |
| INV369057 | Invoice | 01/10/2022 | GF-UNIFORMS-PD | | 0.00 | 327.37 | |
| INV369161 | Invoice | 01/11/2022 | GF-UNIFORMS-PD | | 0.00 | 8.00 | |
| 000034 | ADT SECURITY SYSTEM | | 01/25/2022 | Regular | 0.00 | 127.49 | 70916 |
| 50576495 JAN22 | Invoice | 01/02/2022 | GF-SECURITY SERVICES-PARKS | | 0.00 | 127.49 | |
| 000037 | ADVANCED URGENT CARE AND OCC MED | | 01/25/2022 | Regular | 0.00 | 85.00 | 70917 |
| 72821 | Invoice | 01/20/2022 | GF-M.PACHECO DOT PHYSICAL-STREETS | | 0.00 | 85.00 | |
| 002949 | AIDAN O' DONOVAN | | 01/25/2022 | Regular | 0.00 | 200.00 | 70918 |
| 011822 | Invoice | 01/18/2022 | GF-MARIJUANA APPLICATION REFUND-MISC | | 0.00 | 200.00 | |
| 001293 | AMAZON.COM | | 01/25/2022 | Regular | 0.00 | 2,260.78 | 70919 |
| 17YH-CM6J-TX9Q | Invoice | 12/01/2021 | GF-SPAGHETTI DINNER-CODE | | 0.00 | 641.80 | |
| 1HM3-D34H-6RVH | Invoice | 12/31/2021 | GF-MISC EVENT & EQUIPMENT-COM EVENTS | | 0.00 | 1,618.98 | |
| 000233 | CIRSA/PC | | 01/25/2022 | Regular | 0.00 | 14.49 | 70920 |
| 212136 | Invoice | 12/31/2021 | GF-PC PREMIUM FORD EDGE-MISC | | 0.00 | 14.49 | |
| 000239 | CITY OF FORT LUPTON | | 01/25/2022 | Regular | 0.00 | 200.00 | 70921 |
| 011822 | Invoice | 01/18/2022 | GF-RESTITUTION | | 0.00 | 200.00 | |
| 000239 | CITY OF FORT LUPTON | | 01/26/2022 | Regular | 0.00 | -200.00 | 70921 |
| 002266 | COLORADO PAVING INC | | 01/25/2022 | Regular | 0.00 | 4,000.00 | 70922 |
| 2021-604 | Invoice | 12/01/2021 | Kahil Repaving Project | | 0.00 | 4,000.00 | |
| 000306 | COMCAST BUSINESS | | 01/25/2022 | Regular | 0.00 | 2,186.34 | 70923 |
| 137404023 | Invoice | 01/01/2022 | GF-JAN22 INTERNET SERVICES | | 0.00 | 2,186.34 | |
| 000307 | COMCAST CABLE COMM, LLC | | 01/25/2022 | Regular | 0.00 | 220.04 | 70924 |
| 0164533 FEB22 | Invoice | 01/13/2022 | GF-CABLE/INTERNET-PW SHOP | | 0.00 | 220.04 | |
| 000312 | CONNECT 4 EVENTS AND ENTERTAINMENT LLC | | 01/25/2022 | Regular | 0.00 | 375.00 | 70925 |
| 17100 | Invoice | 12/01/2021 | GF-TRAPPERS DAY GENERATOR RENTAL-CO... | | 0.00 | 375.00 | |
| 000401 | DR HORTON, INC | | 01/25/2022 | Regular | 0.00 | 1,600.00 | 70926 |
| 22FTL-00237-R | Invoice | 01/14/2022 | GF-PERMIT #22FTL-00237-R DEVELOPER FEE... | | 0.00 | 1,500.00 | |
| 22FTL-00246-R | Invoice | 01/14/2022 | GF-PERMIT #22FTL-00246-R DEMO FEE REF... | | 0.00 | 50.00 | |
| 22FTL-00246-R-1 | Invoice | 01/14/2022 | GF-PERMIT #22FTL-00246-R RE-INSPECT FEE... | | 0.00 | 50.00 | |
| 000445 | EWING IRRIGATION PRODUCTS INC | | 01/25/2022 | Regular | 0.00 | 299.50 | 70927 |
| 15926555 | Invoice | 01/14/2022 | GF-MULCH-PARKS | | 0.00 | 299.50 | |
| 000485 | FORT LUPTON HIGH SCHOOL | | 01/25/2022 | Regular | 0.00 | 548.43 | 70928 |
| 011822 | Invoice | 01/18/2022 | GF-RESTITUTION | | 0.00 | 548.43 | |
| 002011 | FRONT RANGE LUMBER COMPANY | | 01/25/2022 | Regular | 0.00 | 29.52 | 70929 |
| 16799/2 | Invoice | 01/18/2022 | GF-FURRING STRIPS-PARKS | | 0.00 | 29.52 | |
| 001881 | HALO BRANDED SOLUTIONS INC | | 01/25/2022 | Regular | 0.00 | 552.97 | 70930 |
| 2022000010035 | Invoice | 01/19/2022 | GF-KN95 MASKS-FAC | | 0.00 | 552.97 | |
| 001930 | HUMANA HEALTH PLAN INC | | 01/25/2022 | Regular | 0.00 | 86,142.59 | 70931 |
| 379450837 | Invoice | 02/01/2022 | GF-HEALTH & EAP FOR FEB22 | | 0.00 | 86,142.59 | |
| 002778 | KASEYA US LLC | | 01/25/2022 | Regular | 0.00 | 8,003.38 | 70932 |
| INV24645448568... | Invoice | 01/07/2022 | Kaseya (BMS) 6 Licenses | | 0.00 | 8,003.38 | |
| 002755 | MAXINE BROOKS | | 01/25/2022 | Regular | 0.00 | 266.00 | 70933 |
| 011822 | Invoice | 01/18/2022 | GF-RESTITUTION | | 0.00 | 266.00 | |
| 000783 | MEANDERING WITH MARY | | 01/25/2022 | Regular | 0.00 | 80.00 | 70934 |

| Vendor Number / Payable # | Vendor Name / Payable Type | Post Date | Payment Date / Payable Description | Payment Type | Discount Amount / Discount Amount | Payment Amount / Payable Amount | Number |
|---|---|---|---|---|---|---|---|
| 011422 | Invoice | 01/14/2022 | CPR-JAN22 CASINO TRIP-SENIORS | | 0.00 | 80.00 | |
| 002216 | NISP WATER ACTIVITY ENTERPRISE | | 01/25/2022 | Regular | 0.00 | 973,750.00 | 70935 |
| 9618 | Invoice | 01/01/2022 | WST-AM2021-214 NISP 18TH INTERIM AGRE... | | 0.00 | 973,750.00 | |
| 000857 | NORTHERN WATER | | 01/25/2022 | Regular | 0.00 | 66,111.11 | 70936 |
| 9651 | Invoice | 01/01/2022 | WST-2022 WINDY GAP FIRMING ASSESSME... | | 0.00 | 66,111.11 | |
| 000865 | OFFICE DEPOT | | 01/25/2022 | Regular | 0.00 | 735.34 | 70937 |
| 211243414001 | Invoice | 12/29/2021 | GF-OFFICE SUPPLIES-COURT | | 0.00 | 447.99 | |
| 216761173001 | Invoice | 12/21/2021 | GF-CHAIRMAT-COURT | | 0.00 | 108.66 | |
| 218492221001 | Invoice | 01/06/2022 | GF-OFFICE SUPPLIES-CITY CL | | 0.00 | 71.82 | |
| 218531997001 | Invoice | 01/06/2022 | GF-STAPLES-ADMIN | | 0.00 | 26.17 | |
| 220618905-1 | Invoice | 01/12/2022 | GF-OFFICE SUPPLIES-ADMIN | | 0.00 | 80.70 | |
| 000885 | PAYMASTER CHECKWRITER CO | | 01/25/2022 | Regular | 0.00 | 371.98 | 70938 |
| 1371 | Invoice | 01/13/2022 | GF-NEW SIGNATURE PLATE-FINANCE | | 0.00 | 371.98 | |
| 002948 | REMI CARSTENS | | 01/25/2022 | Regular | 0.00 | 1,261.20 | 70939 |
| 011822 | Invoice | 01/18/2022 | GF-RESTITUTION | | 0.00 | 1,261.20 | |
| 001008 | SHRED-IT USA LLC | | 01/25/2022 | Regular | 0.00 | 30.00 | 70940 |
| 8000731803 | Invoice | 12/31/2021 | GF-SHREDDING SERVICES-CITY CL | | 0.00 | 30.00 | |
| 002659 | TAIT & ASSOCIATES, INC. | | 01/25/2022 | Regular | 0.00 | 17,326.30 | 70941 |
| 145878 | Invoice | 01/01/2022 | SST-AM2021-204 Engineer Harrison 1st-9th-... | | 0.00 | 17,326.30 | |
| 002918 | TARA ELIASON | | 01/25/2022 | Regular | 0.00 | 100.00 | 70942 |
| 011822 | Invoice | 01/18/2022 | GF-RESTITUTION | | 0.00 | 100.00 | |
| 001075 | THE CONSOLIDATED MUTUAL | | 01/25/2022 | Regular | 0.00 | 217.42 | 70943 |
| DEC21-1 | Invoice | 12/13/2021 | UF-DEC21 ELECTRICAL PERRY PIT-DISCHARGE.. | | 0.00 | 149.84 | |
| DEC21-2 | Invoice | 12/31/2021 | UF-DEC21 ELECTRICAL PERRY PIT-WELL C | | 0.00 | 33.57 | |
| DEC21-3 | Invoice | 12/13/2021 | UF-DEC21 ELECTRICAL PERRY PIT-WELL B | | 0.00 | 34.01 | |
| 001101 | TODD HODGES DESIGN LLC | | 01/25/2022 | Regular | 0.00 | 12,031.25 | 70944 |
| 3391 | Invoice | 01/17/2022 | GF-PLANNING SRCV 1/3-1/16/22-PLANNING | | 0.00 | 12,031.25 | |
| 001105 | TOSHIBA FINANCIAL SERVICES | | 01/25/2022 | Regular | 0.00 | 1,875.87 | 70945 |
| 462526765 | Invoice | 01/07/2022 | Copier Lease | | 0.00 | 1,875.87 | |
| 001126 | TYLER TECHNOLOGIES | | 01/25/2022 | Regular | 0.00 | 604.20 | 70946 |
| 025-362764 | Invoice | 12/31/2021 | GF-2021 INSITE PORTAL FEE-COURT | | 0.00 | 470.00 | |
| 025-363222 | Invoice | 12/31/2021 | GF-DEC21 TEXT NOTIFY-COURT | | 0.00 | 134.20 | |
| 001203 | WELD COUNTY SHERIFF'S OFFICE | | 01/25/2022 | Regular | 0.00 | 59.42 | 70947 |
| 1830 122021 | Invoice | 12/20/2021 | GF-DEC21 PRISONER FEES-COURT | | 0.00 | 59.42 | |
| 001301 | AAA AUTO PARTS INC | | 02/01/2022 | Regular | 0.00 | 20.82 | 70948 |
| 132961 | Invoice | 01/26/2022 | GF-ALTERNATOR BELT-PARKS | | 0.00 | 20.82 | |
| 000026 | ACTIVE CABLING & COMMUNICATIONS LLC | | 02/01/2022 | Regular | 0.00 | 462.16 | 70949 |
| 202743 | Invoice | 01/17/2022 | REC-CABLE AMP | | 0.00 | 462.16 | |
| 000239 | CITY OF FORT LUPTON | | 02/01/2022 | Regular | 0.00 | 100.00 | 70950 |
| 11822 | Invoice | 01/18/2022 | GF-RESTITUTION E.HERNANDEZ, V.MITCHELL | | 0.00 | 100.00 | |
| 000269 | COLORADO ASPHALT SVCS | | 02/01/2022 | Regular | 0.00 | 1,294.50 | 70951 |
| 0059368 | Invoice | 01/03/2022 | GF-COLD ASPHALT-STREETS | | 0.00 | 1,294.50 | |
| 002651 | COLORADO COMMUNITY MEDIA | | 02/01/2022 | Regular | 0.00 | 364.89 | 70952 |
| 45385 | Invoice | 01/07/2022 | GF-PUBLIC NOTICE-FINANCE | | 0.00 | 226.37 | |
| 45871 | Invoice | 01/14/2022 | GF-PUBLIC NOTICES-LEGIS | | 0.00 | 93.32 | |
| 46281 | Invoice | 01/21/2022 | GF-PUBLIC NOTICES-PLANNING | | 0.00 | 45.20 | |
| 000306 | COMCAST BUSINESS | | 02/01/2022 | Regular | 0.00 | 2,084.89 | 70953 |

| Vendor Number / Payable # | Vendor Name / Payable Type | Post Date | Payment Date / Payable Description | Payment Type | Discount Amount / Discount Amount | Payment Amount / Payable Amount | Number |
|---|---|---|---|---|---|---|---|
| 138373910 | Invoice | 01/15/2022 | Comcast Phones | | 0.00 | 2,084.89 | |
| 001766 | ERIKS NORTH AMERICA INC | | 02/01/2022 | Regular | 0.00 | 37.04 | 70954 |
| BN062239 | Invoice | 01/04/2022 | UF-GAUGE-S LINES | | 0.00 | 37.04 | |
| 000455 | FASTENAL COMPANY 01COFTL | | 02/01/2022 | Regular | 0.00 | 12.75 | 70955 |
| COFTL182590 | Invoice | 01/14/2022 | GF-FASTENERS-PW SHOP | | 0.00 | 12.75 | |
| 000597 | INSIGHT PUBLIC SECTOR INC | | 02/01/2022 | Regular | 0.00 | 4,013.64 | 70956 |
| 1100908898 | Invoice | 01/20/2022 | Insight - Microsoft SQL 2019 Server Std (4) li... | | 0.00 | 2,355.12 | |
| 1100909491 | Invoice | 01/22/2022 | Adobe Creative Cloud - Subscription | | 0.00 | 1,658.52 | |
| 000698 | L.G. EVERIST, INC | | 02/01/2022 | Regular | 0.00 | 872.27 | 70957 |
| 582593 | Invoice | 01/21/2022 | SSTX-ICE SLICER/SAND MIXTURE-STREETS | | 0.00 | 872.27 | |
| 000861 | NVAA | | 02/01/2022 | Regular | 0.00 | 1,652.00 | 70958 |
| WINTER 22 | Invoice | 01/25/2022 | CPR-NVAA BASKETBALL DUES-ATHL | | 0.00 | 1,652.00 | |
| 000931 | R & L TIRES | | 02/01/2022 | Regular | 0.00 | 42.50 | 70959 |
| 42532 | Invoice | 01/20/2022 | CEM-TIRE REPAIR | | 0.00 | 42.50 | |
| 001147 | USA BLUE BOOK | | 02/01/2022 | Regular | 0.00 | 553.56 | 70960 |
| 815987 | Invoice | 12/09/2021 | UF-GAUGE/TUBE-W LINES | | 0.00 | 352.81 | |
| 817254 | Invoice | 12/10/2021 | UF-PAINT-W LINES | | 0.00 | 200.75 | |
| 001963 | WASTE CONNECTIONS OF COLO, INC | | 02/01/2022 | Regular | 0.00 | 239.26 | 70961 |
| 5919501V311 | Invoice | 01/17/2022 | GF-FEB22 TRASH SRVC-PARKS | | 0.00 | 134.79 | |
| 5919983V311 | Invoice | 01/17/2022 | CEM-FEB22 TRASH SERVICE | | 0.00 | 104.47 | |
| 001183 | WAXIE SANITARY SUPPLY | | 02/01/2022 | Regular | 0.00 | 524.84 | 70962 |
| 80606636 | Invoice | 01/21/2022 | GF-TRASH BAGS-PARKS | | 0.00 | 524.84 | |
| 001201 | WELD COUNTY SCH DIST RE8 | | 02/01/2022 | Regular | 0.00 | 100.00 | 70963 |
| 11822 | Invoice | 01/18/2022 | GF-RESTITUTION E.HERNANDEZ, V,MITCHELL | | 0.00 | 100.00 | |
| 001224 | XCEL ENERGY-GAS | | 02/01/2022 | Regular | 0.00 | 518.94 | 70964 |
| 764670089 | Invoice | 01/21/2022 | GF-CITY HALL & GENERATOR GAS 12/16-1/1... | | 0.00 | 518.94 | |
| 000119 | BANK OF COLORADO | | 01/28/2022 | Bank Draft | 0.00 | 6,092.87 | DFT0001889 |
| INV0001100 | Invoice | 01/28/2022 | HSA DISTRIBUTION | | 0.00 | 6,092.87 | |
| 000119 | BANK OF COLORADO | | 01/28/2022 | Bank Draft | 0.00 | 475.83 | DFT0001890 |
| INV0001101 | Invoice | 01/28/2022 | HSA DISTRIBUTION | | 0.00 | 475.83 | |
| 001416 | VALIC_1 | | 01/28/2022 | Bank Draft | 0.00 | 34,115.97 | DFT0001891 |
| INV0001102 | Invoice | 01/28/2022 | VALIC - 457(b) $ Contributions | | 0.00 | 34,115.97 | |
| 001265 | IRS | | 01/28/2022 | Bank Draft | 0.00 | 53,044.71 | DFT0001892 |
| INV0001103 | Invoice | 01/28/2022 | Federal Withholding | | 0.00 | 53,044.71 | |
| 001418 | CO DEPARTMENT OF REVENUE | | 01/28/2022 | Bank Draft | 0.00 | 9,921.00 | DFT0001893 |

| Vendor Number | Vendor Name | | Payment Date | Payment Type | Discount Amount | Payment Amount | Number |
|---|---|---|---|---|---|---|---|
| Payable # | Payable Type | Post Date | Payable Description | | Discount Amount | Payable Amount | |
| INV0001104 | Invoice | 01/28/2022 | CO Withholding | | 0.00 | 9,921.00 | |

**Bank Code Pooled Cash Summary**

| Payment Type | Payable Count | Payment Count | Discount | Payment |
|---|---|---|---|---|
| Regular Checks | 67 | 50 | 0.00 | 1,195,078.95 |
| Manual Checks | 0 | 0 | 0.00 | 0.00 |
| Voided Checks | 0 | 1 | 0.00 | -200.00 |
| Bank Drafts | 5 | 5 | 0.00 | 103,650.38 |
| EFT's | 0 | 0 | 0.00 | 0.00 |
| | **72** | **56** | **0.00** | **1,298,529.33** |

# All Bank Codes Check Summary

| Payment Type | Payable Count | Payment Count | Discount | Payment |
|---|---|---|---|---|
| Regular Checks | 97 | 67 | 0.00 | 1,228,016.42 |
| Manual Checks | 0 | 0 | 0.00 | 0.00 |
| Voided Checks | 0 | 1 | 0.00 | -200.00 |
| Bank Drafts | 5 | 5 | 0.00 | 103,650.38 |
| EFT's | 0 | 0 | 0.00 | 0.00 |
| | **102** | **73** | **0.00** | **1,331,466.80** |

# Fund Summary

| Fund | Name | Period | Amount |
|---|---|---|---|
| 600 | GOLF ENTERPRISE FUND | 1/2022 | 32,069.16 |
| 600 | GOLF ENTERPRISE FUND | 2/2022 | 868.31 |
| 999 | POOLED CASH/CONSOLIDATED CASH | 1/2022 | 1,285,635.27 |
| 999 | POOLED CASH/CONSOLIDATED CASH | 2/2022 | 12,894.06 |
| | | | **1,331,466.80** |

**RECORD OF PROCEEDINGS**
**FORT LUPTON CITY COUNCIL/ENTERPRISE BOARDS**
**January 18, 2022**

The City Council of the City of Fort Lupton met in a regular session at the City Complex, 130 South McKinley Avenue, the regular meeting place of the City Council, on Tuesday, January 18, 2022. Due to the COVID-19 virus, the meeting was held with remote access provided through GoToMeeting. Mayor Zo Stieber called the meeting to order at 7:00 p.m. and invited everyone to join her in the Pledge of Allegiance.

**ROLL CALL**

Mari Peña, City Clerk, called the roll. Those present were Mayor Zo Stieber and Councilmembers Chris Ceretto, Bruce Fitzgerald, Valerie Blackston, Carlos Barron, and Claud Hanes. Councilmember David Crespin participated remotely through GoToMeeting.

Also present were City Administrator, Chris Cross, City Clerk, Mari Peña, City Attorney, Andy Ausmus, Planning Director, Todd Hodges, Finance Director, Leann Perino and Public Works Director, Roy Vestal.

**PERSONS TO ADDRESS COUNCIL**

There was no one to address the Council.

Mayor Stieber read the general advisement for connected meetings.

**APPROVAL OF AGENDA**

Staff requested that item 'a' under Public Hearing**,** AM 2022-019 Consideration of a Resolution Accepting an Annexation Petition for the Hagler Annexation Nos. 1-4 Submitted by Mandi Hagler and Lee Hagler and to Set a Public Hearing Date for March 15, 2022, be moved to item 'e' under Action Memorandum. The matteris for a public meeting.

Carlos Barron made a motion to approve the Agenda as amended with the requested item moved from Public Hearing to Action Memorandum and Bruce Fitzgerald seconded the motion. Motion passed unanimously on voice vote.

**REVIEW OF ACCOUNTS PAYABLES**

Council reviewed the January 18, 2022, payables; there were no questions or comments from the Mayor or Council.

**CONSENT AGENDA**

It was moved by Claud Hanes and seconded by Valerie Blackston to approve the Consent Agenda as presented with the following items:

- January 4, 2022 City Council Meeting Minutes
- APPROVE RESOLUTION 2022R007 REAPPOINTING GINNY WHITE TO THE HISTORIC PRESERVATION BOARD FOR A THREE YEAR TERM TO EXPIRE JANUARY 18, 2025 (AM 2022-012)
- Approve Payment of the 2022 Windy Gap Firming Assessment Paid to Northern Colorado Water Conservancy District (NCWCD) From the Water Sales Tax Fund for an Amount not to Exceed $66,111.11 (AM 2022-013)

- APPROVE RESOLUTION 2022R008 TO ACCEPT THE GRANT FROM THE NATIONAL FITNESS CAMPAIGN FOR $25,000.00 AND TO APPROVE THE PURCHASE AND INSTALLATION OF THE OUTDOOR FITNESS COURT NOT TO EXCEED $115,000.00 (AM 2022-015)
- Approve Public Works Wastewater Sewer Service Agreement With Rodolfo Melendez and Hilda Manzo for Sanitary Sewer Service at 1460 14th Street (AM 2022-016)

Motion passed unanimously on roll call vote.

**ACTION MEMORANDUM**

**AM 2022-020 Approve a Resolution for the Cottonwood Greens PUD Amended Sketch Plat and Sketch PUD Plan Submitted by Arbor Capital Partners, LLC to Create a Residential Subdivision**

The Applicant, Arbor Capital Partners, LLC, has submitted a request for an amended sketch plat and sketch PUD plan ("Amended Sketch Plat and Plan") for a residential subdivision that will include 410 single family detached and 137 single family attached units, and will include a clubhouse/neighborhood park, pocket parks and interconnecting trails. This amendment to the original sketch plat and plan brings in an additional parcel, known as the Conner Parcel. It also amends the piece to the north of the Conner parcel, known as the Thermo Farms parcel to reflect layout changes to that parcel from the original sketch plat and plan. The overall Amended Sketch Plat and Plan has also been updated to reflect the final layout of the approved Filing Nos. 1 – 4.

It was moved by Bruce Fitzgerald and seconded by Chris Ceretto to approve Resolution 2022R009, A RESOLUTION OF THE CITY COUNCIL OF FORT LUPTON APPROVING THE COTTONWOOD GREENS PUD AMENDED SKETCH PLAT AND SKETCH PUD PLAN SUBMITTED BY ARBOR CAPITAL PARTNERS TO CREATE A RESIDENTIAL SUBDIVISION. Motion passed unanimously on roll call vote.

**AM 2022-014 Approve Resolution 2022Rxxx of the Fort Lupton City Council Acting as the Fort Lupton Utility Enterprise Board Modifying the Cash-In-Lieu Raw Water Requirement for New Construction**

On March 16, 2015, Resolution 2015R008 was approved modifying the cash-in-lieu water fee requirement to $10,000 per single family unit or 40% of the current Colorado Big Thompson "share" cost whichever was higher.

The City Staff was presented with historical data of water usage and recommends that the City modify its Cash-in-Lieu water fee requirement to $20,000 per single family dwelling unit or 50% of the Colorado Big Thompson "share" cost, market rate, whichever is higher when on a dual system with non-potable water. This would allow builders incentive to build new single family dwellings in the City. City Municipal code 13-122 (e) allows modification to the in-lieu amount by resolution. The current in-lieu amount is current market rate of Colorado Big Thompson, which is $60,000 per share and would be the price for any residential development not on a dual system of potable and non-potable water. This would adjust with current rate. If suitable water shares are brought to the City in place of the cash-in-lieu, the shares can be calculated to fit the cash-in-lieu structure provided if not detailed out already.

The non-potable system incentive would have to be approved through Public works to ensure functionality. The requirements would be for shares used on the City of Fort Lupton's infrastructure. The new rate structure would be effective beginning March 1, 2022.

It was moved by Claud Hanes and seconded by Bruce Fitzgerald to approve Resolution 2022R010, A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF FORT LUPTON ACTING AS THE FORT LUPTON UTILITY ENTERPRISE BOARD MODIFYING THE CASH-IN-LIEU-OF-WATER FEE REQUIREMENT FOR RESIDENTIAL CONSTRUCTION, PER SECTION 13-122 (e) OF THE FORT LUPTON MUNICIPAL CODE, EFFECTIVE MARCH 1, 2022. Motion passed unanimously on roll call vote.

**AM 2022-017 Acceptance of Technical Memorandum #1 From Burns and McDonnell, "Force Main Route Alternative Evaluation" and Selection of US 85 Route as Most Beneficial**

Council approved pursuit of the METRO connection option on April 20, 2021 with AM2021-066. The City has determined that entering into an agreement with the Metro Wastewater Reclamation District's (MWRD) Regional Northern Treatment Plant may be a preferred alternative to expanding the City's Wastewater Treatment Plant (WWTP). The Metro District Board of Director's Resolution NO. 0721-B7.f was approved on July 20, 2021, which determined that the District could feasibly serve the City.

Council approved joining the regional facility is adopted Ordinance 2021-1128, effective on November 12, 2021 "declaring that the public health, safety, and general welfare require the inclusion of said municipality within the district and that the governing body desires to have said municipality included therein upon the terms and conditions prescribed by the board of directors."

Burns and McDonnell has prepared as a part of the engineering services agreement with the City Technical Memorandum #1: Force Main Route Alternative Evaluation and determined the most beneficial route is along the US 85 route.

Engineer's Estimate of Probable Cost for construction of lift station and pipeline to METRO WWTP is $22,000,000 including a $4,500,000 contingency (25%).

It was moved by Carlos Barron and seconded by Bruce Fitzgerald to accept Technical Memorandum #1 from Burns and McDonnell, "Force Main Route Alternative Evaluation" and selection of US 85 Route as Most Beneficial. Motion passed unanimously on roll call vote.

**AM 2022-018 Approve a Resolution Revising the Water and Sewer Infrastructure Investment Fee Schedule**

Periodically, it is necessary to revise the Water and Sewer Plant Investment Fee Schedule. City staff conducted a survey of water and sewer taps in the surrounding region. Of the 6 communities surveyed, Fort Lupton fell on the bottom of the list. The average water tap fee is $15.227.50 for a ¾" meter. During the budget discussions held in October 2021, the City looked at the upcoming needs to expand the water and sewer plants totaling $76 million within the next 20 years. As a result, staff recommends increasing the ¾" residential tap fee to $8,000 per tap and adjust the other tap fees accordingly and adjusting the sewer tap fees to $10,000 and adjusting the other size fees accordingly.

Changes incorporated within this revision include:

Dropping the residential sizes greater than 3/4".
Dropped the 1-1/4" commercial size.
Residential is defined as an owned residence by lot designation. Requires individual service and billing.

Multi-Family is redefined as a commercial enterprise with rental units served by one tap and billing to a single entity.
The METRO designation of SFE (Single Family Equivalent) used as a multiplier of a ¾" service equivalent.

It was moved by Bruce Fitzgerald and seconded by Claud Hanes to approve Resolution 2022R011, A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF FORT LUPTON ACTING AS THE FORT LUPTON UTILITY ENTERPRISE BOARD REVISING THE WATER AND SEWER PLANT INVESTMENT FEE SCHEDULE. Motion passed unanimously on roll call vote.

**AM 2022-019 Consideration of a Resolution Accepting an Annexation Petition for the Hagler Annexation Nos. 1-4 Submited by Mandi Hagler and Lee Hagler and to Set a Public Hearing Date for March 15, 2022**

Mandi Hagler and Lee Hagler (the "Applicants") have submitted an annexation petition to initiate annexation proceedings for two parcels of land and road right of way. The parcels are located north and adjacent to County Road 22 and approximately 0.20 miles east from County Road 19 (Parcel Nos. 131110300014 & 1311110300016). The annexation is considered a flagpole annexation and includes County Road 22 right of way beginning at the intersection of County Road 22 and 23 and continuing west to the western boundary of parcel no. 131110300014. This proposed annexation, known as the Hagler Annexation Nos. 1 – 4, consists of a total of 23.691 acres, more or less. The resolution is to accept the annexation petition and initiate the two-month (60 day) review process that involves staff, referral agencies, Planning Commission and City Council. Approval of the resolution does not constitute approval of the annexation request. Approval of the resolution simply means that there is an interest in considering the annexation, with the final decision to be made by City Council at a public hearing on March 15, 2022.

It was moved by Valerie Blackston and seconded by Carlos Barron to approve Resolution 2022R012, A RESOLUTION OF THE CITY COUNCIL OF FORT LUPTON INITIATING ANNEXATION PROCEEDINGS FOR THE ANNEXATION KNOWN AS THE HAGLER ANNEXATION NOS. 1 – 4 AND SETTING THE PUBLIC HEARING FOR MARCH 15, 2022. Motion passed unanimously on roll call vote.

**STAFF**

There were no reports from Staff.

**MAYOR/COUNCIL REPORTS**

There were no reports from the Mayor or Council.

**FUTURE CITY EVENTS**

| | |
|---|---|
| January 25, 2022 | Town Hall Meeting, 130 S. McKinley Ave. 6:30 p.m. |
| February 1, 2022 | City Council Meeting, 130 S. McKinley Ave. 7:00 p.m. |
| February 8, 2022 | Town Hall Meeting, 130 S. McKinley Ave. 6:30 p.m. |
| February 15, 2022 | City Council Meeting, 130 S. McKinley Ave. 7:00 p.m. |

February 21, 2022 City Offices closed in observance of President's Day.

February 22, 2022 Town Hall Meeting, 130 S. McKinley Ave. 6:30 p.m.

**ADJOURNMENT**

The meeting adjourned at 7:28 p.m.

Submitted by,

_____
Maricela Peña, City Clerk

Approved by City Council

_____
Zo Stieber, Mayor

DRAFT

# CITY OF FORT LUPTON
# CITY COUNCIL

Zo Stieber, Mayor

Valerie Blackston, Ward 1
Chris Ceretto, Ward 2
Carlos Barron, Ward 3

David Crespin, Ward 1
Claud Hanes, Ward 2
Bruce Fitzgerald, Ward 3

**AM 2022-021**

**APPROVING RESOLUTION 2022Rxxx RATIFYING THE MAYOR'S APPOINTMENT OF THE ATTACHED LIST OF CANDIDATES (EXHIBIT "A") TO THE CORRESPONDING ADVISORY/GOVERNING COMMITTEES FOR A TERM BEGINNING FEBRUARY 1, 2022 AND ENDING DECEMBER 31, 2023**

I. Agenda Date: Council Meeting – February 1, 2022

II. Attachments: a. Proposed Resolution

III. Summary Statement:

Terms of all members of all advisory/governing committees shall commence on following every regular municipal election and continue until December 31st the following year. The Mayor shall appoint members to all advisory committees to be ratified by the City Council and members so appointed shall serve at the pleasure of the Mayor. As a result, letters with re-appointment applications were sent to current committee members advising them that their terms will expire December 31, 2021. It was requested that they submit a new application as to their desire regarding continued membership. In addition.

All voting members of advisory committees shall live within one of the following zones (school district, fire district, or Fort Lupton zip code).

IV. Submitted by: _____
Mari Peña, City Clerk

V. Finance Reviewed _____
Finance Director

VI. Approved for Presentation: _____
City Administrator

VII. Attorney Reviewed Approved Pending Approval

VIII. Certification of Council Approval: _____ _____
City Clerk Date

IX. Detail of Issue/Request:

Letters and applications were sent to all existing advisory/governing committee members. In addition, vacancies for committee appointments have been solicited on the City of Fort Lupton's webpage and social media accounts.

Exhibit "A" represents a list of the active general advisory/governing committees with the proposed member list. Current policy establishes that, "Newly elected Mayors shall appoint members to all advisory/governing committees to be ratified by the City Council and members so appointed shall serve at the pleasure of the Mayor."

X. Legal/Political Considerations:

None noted.

XI. Alternatives/Options:

Continue to solicit for applications through announcements on the City of Fort Lupton's webpage and social media accounts.

XII. Financial Considerations:

None noted.

XIII. Staff Recommendation:

Approve the proposed resolution.

**RESOLUTION 2022Rxxx**

**A RESOLUTION OF THE CITY COUNCIL OF FORT LUPTON RATIFYING THE MAYOR'S APPOINTMENT OF THE ATTACHED LIST OF CANDIDATES (EXHIBIT "A") TO THE CORRESPONDING ADVISORY COMMITTEES FOR A TERM BEGINNING FEBRUARY 1, 2022, AND ENDING DECEMBER 31, 2023**

**WHEREAS,** each candidate has submitted a request in the form of an application for the Mayor to consider appointment or reappointment to committee positions allowing them the opportunity to serve the City of Fort Lupton.

**NOW THEREFORE BE IT RESOLVED** that the Fort Lupton City Council hereby ratifies the Mayor's appointment of the attached list of candidates to the corresponding Advisory Committees for a term beginning February 1, 2022 and ending December 31, 2023.

**APPROVED AND PASSED BY A MAJORITY VOTE OF THOSE ELECTED TO THE CITY COUNCIL THIS 1st DAY OF FEBRUARY 2022.**

City of Fort Lupton, Colorado

_____

Zo Stieber, Mayor

Attest:

_____

Maricela Pena, City Clerk

Approved as to form:

_____

Andy Ausmus, City Attorney

**EXHIBIT "A"**
**Advisory/Governing Committee Appointments**

| FINANCE COMMITTEE | | |
|---|---|---|
| **Name** | **Term** | **Position** |
| Jim Sidebottom | 02/01/2022-12/31/2023 | |
| Leann Perino | | City Liaison |
| **SENIOR CITIZEN ADVISORY COMMITTEE** | | |
| **Name** | **Term** | **Position** |
| Lucy Miller | 02/01/2022-12/31/2023 | |
| Mary Ann Merritt | 02/01/2022-12/31/2023 | |
| Monty Schuman<br>Linda Kudrna | | City Liaison |

CITY OF
Fort Lupton
EST 1836

Planning & Building

130 S. McKinley Avenue
Fort Lupton, CO 80621
Phone: 303.857.6694
Fax: 303.857.0351
www.fortluptonco.gov

To: City Council
From: Maria Lancto, Planner
CC: Todd Hodges, Planning Director
Date: February 1, 2022
Subject: Continuance Request for the Sagebrush Apartments Site Plan

---

Staff is requesting a continuance of the public hearing for the Sagebrush Apartments Site Plan to February 15, 2022. This request is to allow time to properly notice the change of zone and comprehensive plan amendment associated with this project that need to be reviewed by City Council prior to review of the site plan application.

The Planning Commission public hearing was continued to February 10, 2022.

## Maria Lancto

**From:** Ryan Zent <ryan.sagebrush@gmail.com>
**Sent:** Friday, January 14, 2022 6:19 PM
**To:** Maria Lancto
**Subject:** Re: Sagebrush Continuance Statement

Hi Maria,

I apologize but I missed this email yesterday.

We are happy to provide anything you need.

Our team is in agreement with the continuance request for the site plan meeting.

Ryan

On Thu, Jan 13, 2022 at 3:12 PM Maria Lancto <MLancto@fortluptonco.gov> wrote:

> Hi Ryan,
>
> Would it be possible for you to provide an email or written statement to the effect that your team is in agreement with the continuance request for the site plan in order for us to correctly notice the comprehensive plan amendment and change of zone? I am prepping for Planning Commission tonight, and I think our chairman will ask for confirmation from the applicant that you understand/agree with continuance.
>
> Thanks,
>
> Maria Lancto
>
> Planner I
>
> 130 S. McKinley Ave.
>
> Fort Lupton, CO 80621
>
> Direct: 720.466.6107
>
> Cell: 303.718.0172

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CITY OF
Fort Lupton
EST 1836

Planning & Building

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Phone: 303.857.6694
Fax: 303.857.0351
www.fortluptonco.gov

To: Planning Commission
From: Maria Lancto, Planner
CC: Todd Hodges, Planning Director
Date: February 1, 2022
Subject: Withdrawal of the SB Weakland Investments Amended Site Plan

---

Staff is requesting a cancellation of the scheduled public hearing for the SB Weakland Investments Amended Site Plan. The applicants have formally withdrawn their applications. A copy of the withdrawal letter is attached.

No further action by City Council is required.

## Maria Lancto

**From:** Mezarina, Al <al.mezarina@maxar.com>
**Sent:** Thursday, January 6, 2022 5:16 PM
**To:** Maria Lancto
**Cc:** Todd Hodges; Hernandez, Ramon; 'Scott Weakland'; Bryan Fry/USA
**Subject:** RE: Status of SB Weakland Investments Amended Site Plan

My apologies for the delayed reply Maria. Yes, Maxar will be looking to go elsewhere as too many difficulties have presented themselves. Please consider this email formal request to withdraw our application..

Thank you

Al Mezarina

*Al Mezarina*
Alberto Mezarina
Program Manager
Corporate Project Delivery
1300 W. 120th Ave
Westminster, CO 80234
O: +1.303.684.4331
C: +1.720.713.9953

al.mezarina@maxar.com

MAXAR

**From:** Maria Lancto <MLancto@Fortluptonco.gov>
**Sent:** Thursday, January 6, 2022 1:58 PM
**To:** Mezarina, Al <al.mezarina@maxar.com>
**Cc:** Todd Hodges <thodges@Fortluptonco.gov>
**Subject:** FW: Status of SB Weakland Investments Amended Site Plan
**Importance:** High

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hello Al,

Please provide an update of the SB Weakland Investments Amended Site Plan. If it is Maxar's intention to withdraw, we will need the withdrawal request in writing. It is highly preferred that we receive this by tomorrow morning. I will be publishing the agenda and packet tomorrow morning for Planning Commissioners to begin their review. If we do not receive a withdrawal request before then, I will publish the entire SB Weakland Investments Site Plan packet, and

Commissioners will begin to review it for approval/denial. Obviously, I do not want to ask them to conduct their review if there is no intention of moving the project forward. A withdrawal request is not necessary if you do plan to move forward with what was previously submitted, but we would appreciate confirmation of your intentions.

Thank you,

Maria Lancto
Planner I
130 S. McKinley Ave.
Fort Lupton, CO 80621
Office: 303.857.6694
Extension: 6107
Cell: 303.718.0172

---

**From:** Chadwin Cox @ Western ECI [mailto:chadwin.cox@westerneci.com]
**Sent:** Tuesday, January 4, 2022 11:01 AM
**To:** Maria Lancto <MLancto@Fortluptonco.gov>; 'Scott Weakland' <sweakland@rlwsand.com>; 'Mezarina, Al' <al.mezarina@maxar.com>
**Cc:** Todd Hodges <thodges@Fortluptonco.gov>
**Subject:** Re: Status of SB Weakland Investments Amended Site Plan

Morning Maria,

I talked with Scott yesterday and he said he was going to reach out to Maxar to have them provide the written request for withdrawal as they had indicated to him they were not proceeding.

Thank you,

Chad

Get Outlook for Android

---

**From:** Maria Lancto <MLancto@Fortluptonco.gov>
**Sent:** Tuesday, January 4, 2022 10:55:19 AM
**To:** Chadwin Cox @ Western ECI <chadwin.cox@westerneci.com>; 'Scott Weakland' <sweakland@rlwsand.com>; 'Mezarina, Al' <al.mezarina@maxar.com>
**Cc:** Todd Hodges <thodges@Fortluptonco.gov>
**Subject:** Status of SB Weakland Investments Amended Site Plan

Hello,

I am reaching out because the Planning Commission public hearing for SB Weakland Investments Amended Site Plan was continued for January 13, 2022, therefore we are putting together the agenda and packet this week. As we have not seen an updated layout, city staff and external referral agencies will not have time to adequately review any potential changes. At this point, we are recommending withdrawal of the application. We can discuss the future of the site at a Pre-Application meeting to determine how to move forward.

In order to withdraw the application, please provide us with a written request of the withdrawal.

If you wish to move forward with what was previously submitted and reviewed, please let me know and can have that ready to go for next week.

Thank you,

Maria Lancto
Planner I
130 S. McKinley Ave.
Fort Lupton, CO 80621
Direct: 720.466.6107
Cell: 303.718.0172

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# CITY OF FORT LUPTON
# CITY COUNCIL

Zo Stieber, Mayor

Valerie Blackston, Ward 1
Chris Ceretto, Ward 2
Carlos Barron, Ward 3

David Crespin, Ward 1
Claud Hanes, Ward 2
Bruce Fitzgerald, Ward 3

**AM 2022-022**

**APPROVE A RESOLUTION ACCEPTING THE COYOTE CREEK PUD FILING NO. 4 PRELIMINARY PLAT**

I. Agenda Date: Council Meeting – February 1, 2022

II. Attachments:

a. Proposed Resolution
b. Planning Commission Resolution P2022-002
c. Staff Report
d. Land Use Application
e. Project Description
f. Preliminary Plat
g. Construction Documents
h. Preliminary Drainage Report
i. Traffic Study
j. Geotechnical Report
k. Preliminary Utility Study
l. SWMP Report
m. Xcel Will Serve Letter
n. United Power Will Sere Letter
o. Referral Responses
p. Legal Notifications

III. Summary Statement:

The applicants, Rowley Downs Land Company and JR Engineering, have applied for approval of a Preliminary Plat, known as the Coyote Creek PUD Filing No. 4 Preliminary Plat. A public hearing for this application was held on January 13, 2022, and Planning Commission recommended approval to City Council of the Preliminary Plat.

IV. Submitted by: _____ Planner

V. Finance Reviewed _____ Finance Director

VI. Approved for Presentation: _____ City Administrator

VII. Attorney Reviewed _____ Approved _____ Pending Approval

VIII. Certification of Council Approval: _____ City Clerk _____ Date

## IX. Detail of Issue/Request:

The applicants, Rowley Downs Land Company and JR Engineering, have applied for approval of a Preliminary Plat, known as the Coyote Creek PUD Filing No. 4 Preliminary Plat. A public hearing for this application was held on January 13, 2022, and Planning Commission recommended approval to City Council of the Preliminary Plat.

The site that is the subject of the Preliminary Plat is located approximately 200 feet (0.04 miles) east of Beth Avenue and approximately 45 feet (0.01 miles) north of 4th street (the Property). The proposed Preliminary Plat is for a single-family detached residential subdivision that will include 59 lots and open space. The subdivision is 13.21 acres, more or less.

The property is currently zoned PUD, with details of the PUD on the Coyote Creek Development Plan from 1996. Pursuant to the Municipal Code, prior to a preliminary plat for a proposed subdivision, a sketch plat must be approved by City Council. The above-mentioned Coyote Creek Development Plan serves as the Master Plan and Sketch Plan for this property.

## X. Legal/Political Considerations:

Notice was mailed to neighbors within 500 feet of the Property on December 21, 2021.

Notice of the public meetings was posted on December 29, 2022, pursuant to the Subdivision Regulations, which require the Applicant post the Property with notice of the hearings at least 15 days prior to meetings.

The Subdivision Regulations require published notice of the meetings in a timely manner prior to the hearings. The Planning Commission and City Council meetings were published in the Fort Lupton Press on December 29, 2022.

## XI. Alternatives/Options:

The City Council has the following options for each request:

a) Approve the proposed resolution.
b) Approve the proposed resolution with conditions.
c) Continue the hearing for additional information or further study.
d) Deny the proposed resolution.

## XII. Financial Considerations:

All applicable land use application fees have been paid and a fee deposit has been submitted to cover costs related to the application.

## XIII. Staff Recommendation:

Staff recommends conditional approval of the Coyote Creek PUD Filing No. 4 Preliminary Plat.

**RESOLUTION NO. 2022Rxxx**

**A RESOLUTION OF THE CITY COUNCIL OF FORT LUPTON APPROVING THE COYOTE CREEK PUD FILING NO. 4 PRELIMINARY PLAT FOR A SINGLE-FAMILY DETACHED RESIDENTIAL SUBDIVISION LOCATED IN THE NORTHEAST QUARTER OF SECTION 5, TOWNSHIP 1 NORTH, RANGE 66 WEST OF THE 6TH P.M., COUNTY OF WELD, STATE OF COLORADO.**

**WHEREAS,** the Planning Commission held a public hearing on January 13, 2022, for the purpose of reviewing the Coyote Creek PUD Filing No. 4 Preliminary Plat; and

**WHEREAS,** the Coyote Creek PUD Filing No. 4 Preliminary Plat proposes to develop a property for a single-family detached residential subdivision with 59 lots and an open space amenity area; and

**WHEREAS,** after review of the application for the Coyote Creek PUD Filing No. 4 Preliminary Plat, and consideration of staff comments, applicant's presentation, and any public input, the Planning Commission recommended approval of the Coyote Creek PUD Filing No. 4 Preliminary Plat; and

**WHEREAS,** all legal requirements for the public hearing have been met, including mailing of public hearing notices to adjacent property owners within 500 feet; and

**NOW THEREFORE BE IT RESOLVED,** that the Fort Lupton City Council reviewed the plans and supporting documentation, all referral comments and any citizen input in response to this application. Based upon review of the applicable policies and goals in the Fort Lupton Comprehensive Plan, review of the Subdivision and Zoning Regulations, an analysis of referral comments and facts presented on this date, the City Council hereby recommends approval of the Coyote Creek PUD Filing No. 4 Preliminary Plat located in the Northeast Quarter of Section 5, Township 1 North, Range 66 West of the 6th P.M., City of Fort Lupton, County of Weld, State of Colorado with the following conditions:

I. Prior to finalizing the Preliminary Plat:

   A. The title of the Preliminary PUD Plat shall include the Project No.: LUP2021-0032 & Plan No.: PPL2021-0005.

   B. The Applicant shall update the Preliminary Plat with any redlined changes provided by staff.

   C. The Applicant shall work with City staff to finalize the street names within the development.

   D. Applicant shall adequately address the comments from United Power.

   E. Applicant shall adequately address any concerns expressed by the Weld RE-8 School District and coordinate the proposed pedestrian access between the development and Twombly Elementary School

II. As part of the Final Plat Application:

   A. Applicant shall adequately address the comments from the Fort Lupton Fire Protection District.

   B. Applicant shall work with the Golf Course manager to adequately address their concerns.

   C. Applicant shall adequately address the comments from Public Works including finalizing a subdivision improvements agreement.

D. Applicant shall adequately address the comments from Xcel Energy.

**APPROVED AND PASSED BY A MAJORITY VOTE OF THOSE ELECTED TO THE CITY COUNCIL OF THE CITY OF FORT LUPTON, COLORADO THIS 1st DAY OF FEBRUARY, 2022.**

City of Fort Lupton, Colorado

_____

Zo Stieber, Mayor

Attest:

_____

Maricela Peña, City Clerk

Approved as to form:

_____

Andy Ausmus, City Attorney

**RESOLUTION NO. P2022-002**

**A RESOLUTION OF THE PLANNING COMMISSION OF FORT LUPTON RECOMMENDING TO CITY COUNCIL APPROVAL OF THE COYOTE CREEK PUD FILING NO. 4 PRELIMINARY PUD PLAT LOCATED IN THE NORTHEAST QUARTER OF SECTION 5, TOWNSHIP 1 NORTH, RANGE 66 WEST OF THE 6TH PRINCIPAL MERIDIAN, CITY OF FORT LUPTON, COUNTY OF WELD, STATE OF COLORADO.**

**WHEREAS,** Rowley Downs Land Company and JR Engineering ("Applicants") have applied for approval of the Coyote Creek PUD Filing No. 4 Preliminary Plat for 59 single family detached residential lots (the "Application"); and

**WHEREAS,** the Planning Commission held a public meeting on January 13, 2022 for the purpose of reviewing the Coyote Creek PUD Filing No. 4 Preliminary Plat; and

**WHEREAS**, after review of the Application and consideration of staff comments, Applicant's presentation and any public input, Planning Commission finds the request for the Coyote Creek PUD Filing No. 4 Preliminary Plat conforms with City codes and requirements and policies therein; and

**WHEREAS,** all legal notification requirements have been met, including publishing the time and place of the public hearings in the Fort Lupton Press, posting notice at least fifteen (15) days before the hearings on the property, mailing notice to property owners within five-hundred (500) feet of the property and to oil and gas lessees on the property; and

**NOW THEREFORE BE IT RESOLVED,** the Planning Commission has considered the application and has taken into consideration staff comments, the applicant presentation, all referral comments and any citizen testimony in response to this application. Based upon the review of applicable policies and goals in the Fort Lupton Comprehensive Plan, review of the Subdivision and Zoning Regulations, and the facts presented on this date, the Planning Commission hereby recommends approval of Coyote Creek PUD Filing No. 4 Preliminary Plat for a planned unit development located in the northeast quarter of section 5, Township 1 North, Range 66 West of the 6th Principal Meridian, City of Fort Lupton, County of Weld, State of Colorado, with the following conditions:

I. Prior to finalizing the Preliminary Plat:

   A. The title of the Preliminary PUD Plat shall include the Project No.: LUP2021-0032 & Plan No.: PPL2021-0005.

   B. The Applicant shall update the Preliminary Plat with any redlined changes provided by staff.

   C. The Applicant shall work with City staff to finalize the street names within the development.

D. Applicant shall adequately address the comments from United Power.

E. Applicant shall adequately address any concerns expressed by the Weld RE-8 School District and coordinate the proposed pedestrian access between the development and Twombly Elementary School

II. As part of the Final Plat Application:

A. Applicant shall adequately address the comments from the Fort Lupton Fire Protection District.

B. Applicant shall work with the Golf Course manager to adequately address their concerns.

C. Applicant shall adequately address the comments from Public Works including finalizing a subdivision improvements agreement.

D. Applicant shall adequately address the comments from Xcel Energy.

**DONE THIS 13th DAY OF JANUARY, 2022, BY THE PLANNING COMMISSION FOR THE CITY OF FORT LUPTON, COLORADO.**

_____

**Chairman**

**ATTEST:**

_____

**Planning Director**

***Resolution P2022-002 was approved by Planning Commission on January 13, 2022. Due to the addition of a new condition of approval, the resolution was not signed during the meeting. Staff is working to coordinate the signing of the resolution.***

# RECORD OF PROCEEDINGS
# FORT LUPTON PLANNING COMMISSION
# January 13, 2022

The Planning Commission of the City of Fort Lupton met in session at the City Complex, 130 South McKinley Avenue, the regular meeting place of the Planning Commission and virtually via GoToMeeting, on Thursday, January 13, 2022.

Chair Mike Simone called the meeting to order at 6:00 p.m.

**ROLL CALL**

Board Members Present: Chair Mike Simone, Kathy Kvasnicka, and Member Paul Weber. Member Thomas Holton participated remotely via GoToMeeting. Vice-Chair Bush White arrived at 6:01 PM

City Staff Present: Planning Director Todd Hodges, Planner Maria Lancto and Planning Technician Magaly Morales-Tejada. Planner Alyssa Knutson participated remotely via GoToMeeting.

Chair Simone gave the following advisement:

> Tonight's meeting shall be a hybrid meeting so as to ensure the health and safety of the general public and the City of Fort Lupton City Council, Planning Commission and staff.
>
> The intent and purpose of the virtual appearance option is to allow the City to be innovative in providing the general public the most meaningful access possible in light of the current challenges present as a result of the Covid-19 pandemic.
>
> An electronic link has been made available for tonight's meeting on the City's website and social media platforms and as posted at City Hall, so that the general public, Planning Commission and staff may participate electronically via the internet or on the phone.

**APPROVAL OF AGENDA**

Paul Weber moved to approve the agenda and Kathy Kvasnicka seconded.

**CONSENT AGENDA**

Paul Weber moved to approve the consent agenda and Kathy Kvasnicka seconded.

**PUBLIC COMMENT**

Jan Martin, resident in the Coyote Creek subdivision, stated that she would like to know the City's plans for inner road improvements in the Coyote Creek development.

**ACTION ITEMS**

**P2022-002 Coyote Creek PUD Filing No. 4 Preliminary Plat**

Planner Maria Lancto presented this item, she stated that this site is located northwest of the Coyote Creek Golf Course and south and adjacent of Twombly Elementary. The proposal includes 59 single family detached residential lots and will include a central open space area with a tot lot. The site is zoned PUD and was master planned as part of the Coyote Creek PUD Master Plan, which identifies this area as multi-family, however the map notes allow for lower densities, therefore this proposal is in line with the overall master plan. All notification requirements have been met and the applicants will provide a brief presentation.

DRAFT

Chair Simone asked applicant, Ken Merritt, if he understood that some members of the Planning Commission are appearing tonight via virtual connection and are not appearing in-person, if he consented to said members voting on his submittal, even though said members are not present in person, if he has agreed to voluntarily waive that right on behalf of the applicant or themselves by proceeding tonight electronically and if he voluntarily signed and submitted the written waiver and consent to proceed electronically tonight.

Mr. Merritt answered yes to all questions.

Mr. Merritt stated that the property is located in the Northwest corner of the "Fort Lupton Residential Development Plan", south of Twombly Elementary and east of residential development. The Coyote Creek Golf Course lies east and south of this property, Coyote Creek Filing No.1 is also south of the property. This property was originally identified as 193 multi-family residential units, however this proposal is for 59 single family residential units, therefore is in better compatibility with the surrounding land uses and considerably decreases the density. There will be two entries into this development, the primary entrance being on 4th St and the other on the north end of the property via Twombly road. There will be 2 different lot sizes throughout the property, the density of the development is approximately 3.5 units per acres and there is 17% or 2.5 acres of open space in the center of the development, which will hold a park with a tot lot. The builder for this development will be Challenger Homes and there will be a variety of homes both two-story and single story homes.

Chair Simone asked Mr. Merritt if he felt that he had a full and fair opportunity to present all application materials to the commission tonight.

Mr. Merritt stated yes.

Chair Simone opened up the public comment portion of the hearing.

Cheryl Loskota, a resident of the Coyote Creek Subdivision, asked when the residential properties were established on the golf course? What will the City do to protect properties from golfers? What the distance from the school to the fence lines on the homes along Twombly road are and if it's possible to add a green belt between those properties and the school? What is the total height of the tallest home?

Jan Martin, a resident of the Coyote Creek Subdivision, asked if the Planning Commission has ever considered that piece of property for an extension to the school and what the commission has done to plan for more schools for the continued growth of the City?

Chair Simone, responded to Ms. Martins question, stating that the school board is separate from the Planning Commission and form his previous experience on the school board, this specific property would most likely not be the most viable option for more school growth.

Planning Director Hodges added that this is a private property that has bene planned as a residential development, however if the school had any interest in the property they could have approached the property owner.

Jan Martin added that she is also concerned about the increase in traffic by the school with one of the entrances being behind the school.

DRAFT

Mike Loskota, at 1837 Homestead Dr, stated that they did not receive a letter regarding this project, and only saw the public notice signs on the property. He expressed disappointment that his Spanish speaking neighbors did not receive a notice in Spanish. He stated that the Coyote Creek HOA has stated that the HOA would be responsible for the new addition. Mr. Loskota added that when they purchased their home a $20,000 premium was paid for unobstructed view to the West of his home.

Planning Director Hodges stated that this property was already platted and planned for taller multi-family units when they purchased their home and the city cannot control the unfortunate premium that was charged by the builder.

Jan Martin, asked if there was any truth to a statement made by the builder for the previous Filing 3 which had incentive of paying an additional $9,000 and the homeowner would not have an outside water bill.

Director Hodges explained that that specific concern is not in the purview of the planning commission and would not be part of this hearing.

Jan Martin asked if the builder for this filing would have any incentives similar to those mentioned?

With no further questions, Chair Simone closed the public comment portion of the hearing.

Applicant Ken Merritt answered some of the questions. He stated that the lots along the southern boundary of the school do back right up to the property line and are technically directly adjacent to the school property with no landscape buffer, there is a bit of an elevation difference along with a chain link fence on the school property. He stated that, as shown on the aerial view of the area, approximately 40% of the school property is still undeveloped. With regards to traffic concerns, a transportation impact analysis was conducted and it was determined that most of the traffic would come through 4$^{th}$ St. rather than the school road.

Mr. Merritt added that the Master Plan has been in place since 2002 and the property was originally planned to be 3-story multi-family units, however they felt as though single family homes would be a more compatible use. Mr. Merritt stated that this property will use non-potable water for irrigation purposes.

Chair Simone opened up the hearing to Planning Commissioner's comments.

Chair Simone asked staff what the buffer is for mailing notifications to neighbors, if the school district was notified and if they responded?

Planner Lancto stated that the buffer is 500 feet and the school was notified but no response was received. Ms. Lancto pulled up the 500' buffer shown on the County's map and it was established that Mr. Loskota was not within the 500 feet which is why he did not receive a mailing.

Member Holton asked for clarification on the property lines of the homes next to school and if they would be directly adjacent to the chain link fence

Mr. Merritt stated that those rear lot lines of the development are concurrent with the norther boundary of property which is adjoined with the school lot line and there will be no buffer.

DRAFT

Member Holton asked if there are plans on improvements to the existing chain link fence if no buffer will exist.

Mr. Merritt stated that the intent is to have an approximately 42" rail fence along the property and homeowners have the option to add individual side fences. There is no allowance in the current submittal for a 5' screening fence. The plan for the northern properties is to have a trail way into the school for residents to walk their children to school.

Member Holton asked if there is planned pedestrian access onto the school property?

Mr. Merritt stated that is the intent.

Planning Director Hodges asked that a condition of approval be added based on these comments that the developer follow up directly with the school administration to address any concerns with the fencing and the proposed pedestrian access.

Member Weber asked what the space between the homes on the West end of the property and the ditch will look like.

Mr. Merritt stated that directly behind those lots is an existing 20 foot utility easement, those bordering lots will be concurrent with the easement and will have a rail fence.

Member Weber asked if the HOA will maintain the open space within the development?

Mr. Merritt stated that it will be maintained by the HOA and not-potable water will be used to maintain this area.

Member White asked if there have been any direct conversations with the school district regarding a potential increase in students and if any plans are in place to improve the fencing between the properties.

Mr. Merritt stated that at this point there had not been any direct conversations, however as previously mentioned and as added to the conditions of approval, they will reach out to the school directly and address any concerns that may come up.

Director Hodges added that he has met and will continue to meet with the school district's administration to work together to address future city growth and the impacts to the schools.

Member Holton asked if these conversations are going through the School Board of with the superintendent?

Planner Lancto stated that referrals are sent directly to Superintendent Kaylor.

Member Kvasnicka stated that she would like to see a screening or separation between the school and the lots that abut the school property.

Chair Simone stated that he would like to see more 4 sided architecture on the buildings.
Lee Eisenheim, with Challenger Homes, stated that there are actually requirements within the city for separation on the rear walls and it is a standard for Challenger Homes to provide 4 sided architecture and all of the homes will have some sort of differentiation.

DRAFT

Chair Simone asked if the builder will provide some sort of enhancement to the homes to protect from golfers.

Mr. Eisenheim stated that Challenger Homes aims to be transparent with buyers about the concerns on a golf course, due to liability issues they do not provide enhancement as part of the contract however they do provide buyers with contacts for options to add stronger windows, golf balls screens and other enhancements.

With no further comments, Member White moved to approve P2022-002 as amended with the added condition of approval. It was seconded by Member Weber. Motion passed unanimously.

**Continuance of Sagebrush Apartments Site Plan**

Planner Lancto stated that staff is requesting a continuance due to the Comprehensive Plan Amendment portion of this application not being properly noticed.

Member White motioned to continue this hearing to February 10, 2022. Kathy Kvasnicka seconded. Motion passed unanimously.

**Withdrawal of SB Weakland Investments Amended Site Plan**

The applicants for this project have chosen to withdraw this application.

**DISCUSSION ITEMS**

**Review of Meeting Discussion**

A review of meeting discussions took place.

**Development Code Update**

A discussion of the Development Code Update took place.

**FUTURE BUSINESS**

The next meeting of the Planning Commission will be on February 10, 2022 at 6:00 PM.

**ADJOURNMENT**

Chair Simone adjourned the meeting at 6:53 PM.

Submitted by

_____
Magaly Morales-Tejada, Planning Technician

Approved by Planning Commission

_____
Mike Simone, Chair

DRAFT

**COYOTE CREEK PUD FILING NO. 4 PRELIMINARY PLAT**
**STAFF REPORT**
**LUP2021-0032 & PPL2021-0005**

**PROJECT DESCRIPTION**

Project Nos.: LUP2021-0032 & PPL2021-0005

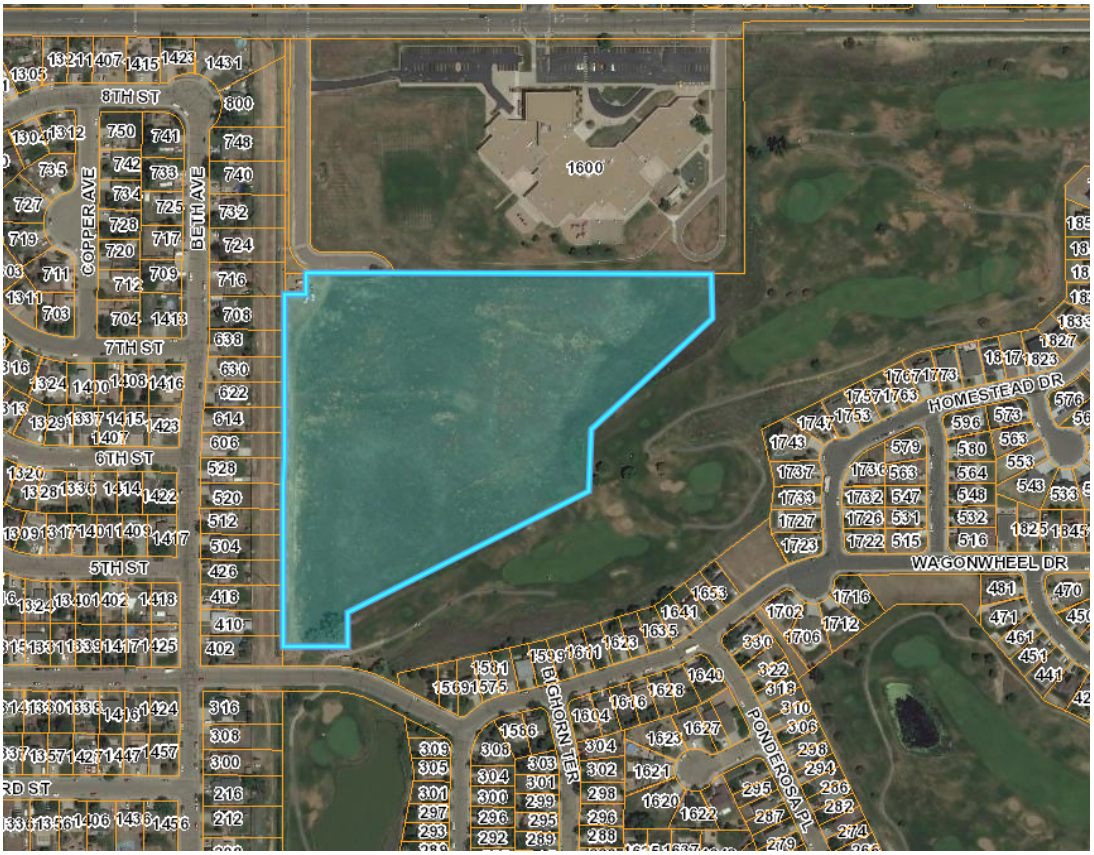
Project Name: Coyote Creek PUD Filing No. 4 Preliminary Plat

Owner's Name: James Nicholson with Rowley Downs Land Company

Representative's Name: Kenneth Merritt with JR Engineering

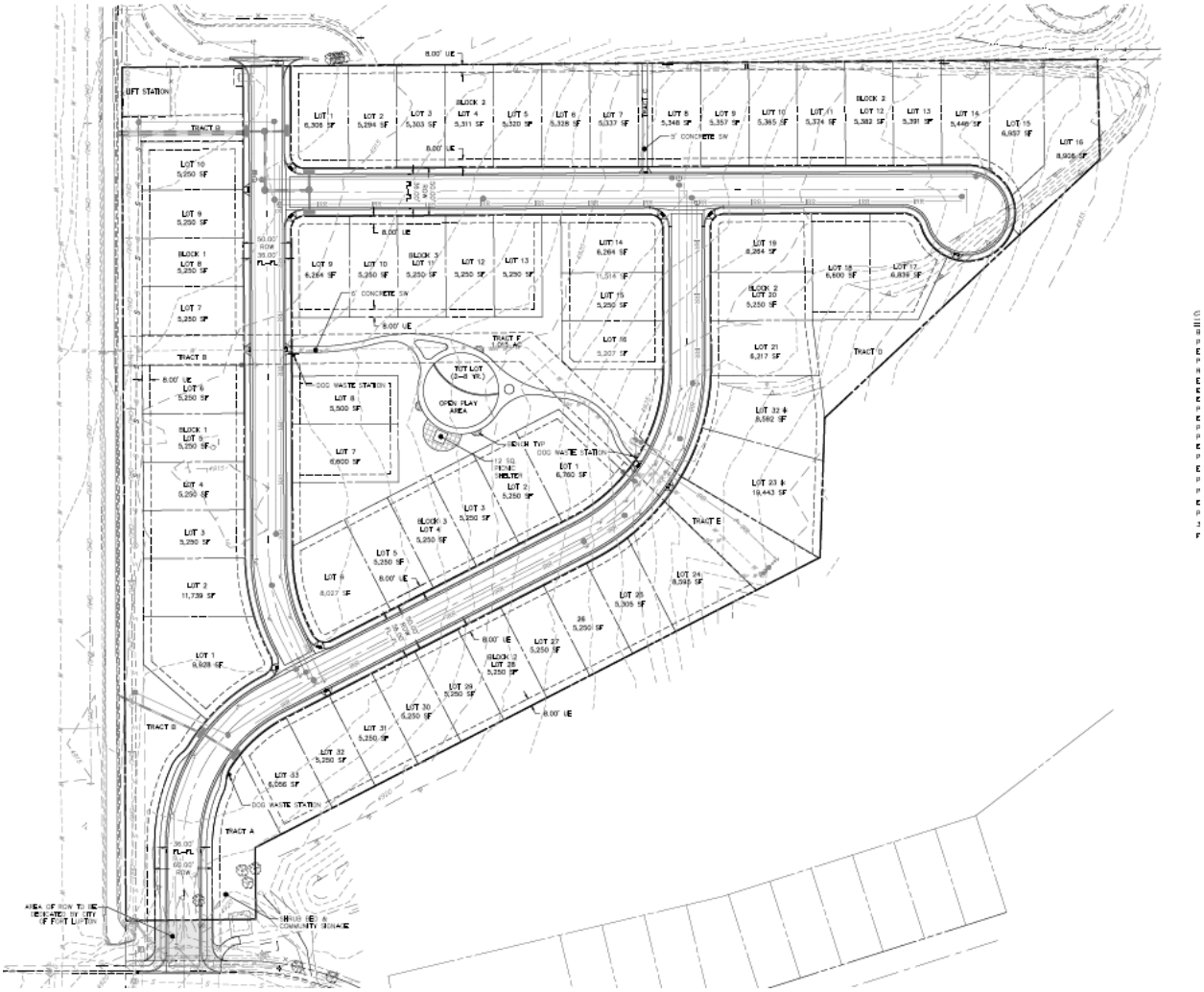
Location of Request:

The site consists of land located approximately 200 feet (0.04 miles) east of Beth Avenue and approximately 45 feet (0.01 miles) north of 4th Street, and is situated directly south of Twombly Elementary School (the "Property"). The Property is located in the Northeast Quarter of Section 5, Township 1 North, Range 66 West of the 6th Principal Meridian, City of Fort Lupton., County of Weld, State of Colorado.



Nature of Request:

The Applicant has submitted a request for a preliminary plat for 59 single family detached residential lots, and will include a central open space area with tot lot.



Site Size: 13.21 acres, more or less.

Zone District: PUD Planned Unit Development.

Proposed Use: Residential uses to include 59 single family detached residential lots, including open space amenity area.

Existing Use: Vacant.

Hearing Dates: Planning Commission – January 13, 2022 at 6:00 PM; and
City Council – February 1, 2022 at 7:00 PM.

Hearing Location: Fort Lupton City Hall – Council Chambers, 130 S. McKinley Ave., Fort Lupton, Colorado, with an option to attend virtually via GoToMeeting.

Staff Recommendation: Approval with conditions, as shown on the proposed resolution.

**SUMMARY OF PREVIOUS APPLICATIONS**

This property was originally annexed in 1994 with a larger area that was known as the Twombly Annexation. The Coyote Creek Development Plan from 1996 serves as the master PUD plan for this property. This piece is considered the fourth filing of the Coyote Creek development.

A final plat application has been submitted for concurrent review.

**APPLICATION PROCESS**

The Applicant is requesting approval of a preliminary plat for a residential subdivision that will include 59 single family detached homes, including open space amenity area.

Under the Fort Lupton Municipal Code, after required public notice of the preliminary plat, the Planning Commission shall consider the application, referral comments and any public testimony at a public hearing and make a recommendation to City Council to approve, approve with conditions or deny the preliminary plat. The Planning Commission's comments shall be based on the evidence presented, conformance with the Comprehensive Plan and compliance with the City's standards, regulations and policies.

The City Council shall then conduct a public hearing and evaluate the preliminary plat, referral agency comments, Planning Commission recommendation and any public testimony. City Council shall approve, conditionally approve, continue for additional information or for further study or deny the application based on the evidence presented and compliance with the City's standards, regulations and policies and other guidelines.

**NOTIFICATION REQUIREMENTS**

The Subdivision Regulations require published notice of the hearings in a timely manner prior to the hearings. The Planning Commission and City Council hearings were published in the Fort Lupton press on December 29, 2021.

Notice of the public hearings were posted on the Property on December 29, 2021, pursuant to the Subdivision Regulations, which require the Applicant post the Property with notice of the hearings at least fifteen (15) days prior to the hearings.

Notice was mailed to neighbor within 500 feet of the Property, and owners and lessees of mineral interests on December 22, 2021.

**CONFORMANCE WITH CITY STANDARDS, REGULATIONS AND POLICIES**

The area is zoned PUD Planned Unit Development with residential uses. The objective of a PUD is to provide for the planning and development of substantial tracts of land, suitable in location and character for the uses proposed, as unified and integrated entities in accordance with detailed development plans.

The Preliminary Plat is for a residential subdivision to include 59 single family detached residential lots, including common areas and interconnecting trails. The Applicant has submitted the required documents pursuant to the Code.

The PUD plan was previously approved.

**CONFORMANCE WITH THE COMPREHENSIVE PLAN**

The Future Land Use Map designates this area for Single-Family Attached land uses. This designation allows for single family attached homes in formal, planned developments. These provide higher density and more affordable housing options to complement traditional single family detached neighborhoods. Opportunities for new single family attached will help increase housing diversity and attract a wide range of potential residents

The proposed development plans for single family detached homes within Filing No. 4. The Master Planned Coyote Creek Development originally proposed multi-family housing at this location, however did provide for the ability to develop single family attached or detached housing. The application also shows smaller lots creating a higher density neighborhood.

**REFERRALS**

Referrals were provided to the list below. Any comments received are enclosed with the Planning Commission packet.

| | | |
|---|---|---|
| Building Inspector | City Attorney | GIS Specialist |
| Police Chie | Public Works Director | Golf Course Manager |
| Fort Lupton Fire Protection District | CDOT | Colorado Parks and Wildlife |
| Unite Power | Comcast | CenturyLink |
| Xcel Energy | Postmaster | Weld County School District RE-8 |
| Weld County GIS | NCWCD | |

***For more information on this development, please refer to the Planning Commission packet provided. Additional documents are available for review at the Fort Lupton City Hall.***

Form PLAN002

CITY OF Fort Lupton EST 1836

Planning & Building

130 S. McKinley Avenue
Fort Lupton, CO 80621
Phone: 303.857.6694
Fax: 303.857.0351
www.fortluptonco.gov

Project No. _____

# Land Use Application Form

## A. CONTACT INFORMATION

1) Property Owner Name: James Nicholson

Company: Rowley Downs Land Company

Phone: 703-317-7080 Email: _____

Address: 260 Krameria Street Denver, CO 80220

Preferred method of contact? Email: ☑ Phone: ☑ Mail: ☐

2) Representative Name: Kenneth Merritt APA, RLA

Company: JR Engineering

Phone: 970-305-6754 Email: kmerritt@jrengineering.com

Address: 2900 South College Ave. Fort COllins, CO 80525

Preferred method of contact? Email: ☑ Phone: ☑ Mail: ☐

3) Billing Contact *(where invoices should be directed to)*: Bob Quinette

Billing Company: Lupton Land, LLC

Phone: 303-587-1966 Email: bob.quinette@gmail.com

Address: 10221 Prestwick Trail Lone Tree , CO 80124

## B. SITE DESCRIPTION

Site Address: TBD

Parcel Number: 147105100053

Existing Zone Classification: PUD Proposed Zone Classification: PUD

Water Type: Municipal Name: _____

Sewage Type: Municipal District Name or Location Hauled to: _____

## C. APPLICATION TYPE (CHECK ALL THAT APPLY)

| | | |
|---|---|---|
| ☐ Sketch Plat | ☐ Administrative Site Plan | ☐ PUD Plan (Preliminary & Final) |
| ☑ Preliminary Plat | ☐ Special Use Permit | ☐ Variance |
| ☐ Final Plat | ☐ Oil & Gas Permit | ☐ Administrative Variance |
| ☐ Minor Subdivision | ☐ Annexation & Initial Zone | ☐ Appeal |
| ☐ Amended Plat | ☐ Change of Zone | ☐ Other: _____ |
| ☐ Site Plan | ☐ Comp Plan Amendment | |

Project No. _____

## D. PROJECT DESCRIPTION

Project Name: Coyote Creek Filing 4

Please provide a short description of the proposed project in the space provided below:

Coyote Creek Filing 4 is generally located in the northwest corner of the approved Coyote Creek PUD Master Development Plan and is designated as Parcel A being approximately 13 acres in size. Parcel A is currently identified on the approved PUD Master Development Plan as Multi-Family and allows for up to 193 Multi-Family Dwelling Units with an allowed Density of 14.9 Dwelling Unit per Acre. Coyote Creek Filing 4 is proposing to modify the current approved Land Use from Multi-Family to Single Family Detached Residential which if approved would allowing for 59 Single Family Detached Residential Lots on 13.35 Acres with a Gross Density of 4.42 Dwelling Units per Acres.

## E. REQUIRED DOCUMENTS

For an application to be considered complete, and for planning staff to begin review and schedule any applicable public hearings, this Land Use Application Form must be fully completed and all required attachments included. Planning staff will review the application for completeness and will provide notice to the representative and/or owner whether the application has been deemed complete.

## F. CERTIFICATIONS

**Representative Certification**

By signing this application, I attest that I am acting with the knowledge and consent of all owners of the property that is the subject of this application, and that I have been designated to act as the representative for the project described in this land use application. I further certify that all information submitted with this application is true and accurate to the best of my knowledge.

Representative: Ken Mutt _____ Date: 11/17/21

**Owner Certification**

I hereby certify that I am the legal owner of record of the property that is the subject of this application. I hereby authorize the representative listed on this application, if any, to communicate directly with City officials and to submit documentation and information regarding this application on my behalf.

Owner: C. Ken Mutt _____ Date: 11/17/21

CCI as Agent for Rowley Downs Land Company

---

**For Office Use Only**

Received Date: _____

If the application is not complete, state reasons why it is incomplete:

_____

_____

_____

Deemed Complete Date: _____

Fees Submitted: _____ Escrow Submitted: _____

## Instructions for Submitting the Land Use Application Form

**DEFINITIONS**

Words in the singular include the plural and words in the plural include the singular.

*Application* refers to the official submittal to the City of Fort Lupton's Planning Department for review of the proposed land use development identified in the land use application form. The application includes the form, all materials submitted for review of the project, including those documents required under the Land Use Regulations of the Municipal Code, and any additional information provided.

*Project* refers to the land use development identified on the land use application form and application materials.

*Property* refers to the land that is being proposed for development as described in the land use application form and application materials.

**A. CONTACT INFORMATION**

1) Provide contact information for all owners of any property that is the subject of the application. If the contact information for all property owners will not fit on the space provided, submit a separate sheet for the additional owners.
2) Provide contact information for all persons, firms or businesses that are authorized by the owners identified in Section A(1) to work on the land use application, including, but not limited to, discussing the project, submitting application materials, and attending meeting and hearings. If the contact information for all representatives will not fit on the space provided, submit a separate sheet for the additional representatives.
3) Provide contact and mailing information for the person that should receive all invoices for the project. If this person changes at any time, contact the Planning Department immediately to update this information.

**B. SITE DESCRIPTION**

Provide all information requested. Parcel numbers and address information may be found at the Weld County Property Portal at https://www.co.weld.co.us/maps1/propertyportal/. Current zoning can be found at http://www.fortlupton.org/405/Zoning.

**C. APPLICATION TYPE**

Select the land use application that is applicable to the project. If there are multiple land use application types being submitted to run concurrently, select all that apply. The land use application types will be identified during the required pre-application meeting. If you have any questions about this, please contact the Planning Department at 303.857.6694 or planningdept@fortlupton.org.

**D. PROJECT DESCRIPTION**

Please select a project name that will be referenced throughout the project and a description of what the project entails. If you need more space for the project description, please attach a separate sheet.

**E. REQUIRED DOCUMENTS**

Required documents will be discussed during the pre-application meeting with the Planning Department. If any documents are missing, the acceptance of the application may be delayed until the submittal is complete.

**F. CERTIFICATIONS**

**Representative Certification.** Provide the signature of all authorized representatives in this section.
**Owner Certification.** Provide the signature of all owners of properties included in the application in this section.

**For any other questions, please contact the Planning Department at 303.857.6694 or planningdept@fortlupton.org.**

## Coyote Creek Filing No. 4 - Development Narrative

Coyote Creek Filing 4 is generally located in the northwest corner of the approved Coyote Creek PUD Master Development Plan and is designated as Parcel A being approximately 13 acres in size. Parcel A is currently identified on the approved PUD Master Development Plan as Multi-Family and allows for up to 193 Multi-Family Dwelling Units with an allowed Density of 14.9 Dwelling Unit per Acre. Coyote Creek Filing 4 is proposing to modify the current approved Land Use from Multi-Family to Single Family Detached Residential which if approved would allowing for 59 Single Family Detached Residential Lots on 13.35 Acres with a Gross Density of 4.42 Dwelling Units per Acres.

Also included as part of Coyote Creek Filing 4 Development is 2.84 Acres of Public Street Right-of-Way Dedication (21.3% of Total Site Area), 1.47 Acres of Common Open Space (11.0% of Total Site Area) to be owned and maintained by the Coyote Creek Filing 4 Home Owners Association (HOA) and 1.01 Acres of Park Public Land Dedication (7.7% of Total Site Area) to also be owned and maintained by the Coyote Creek Filing 4 (HOA). When approved by the City the Developers of Coyote Creek Filing 4 when will also be responsible to construct all necessary Public Roads, Water, Sanitary Sewer, Storm Sewer and Gray Water Irrigation infrastructure needed to support the proposed Single Family Residential Development.

# COYOTE CREEK FILING NO. 4

## COYOTE CREEK PA-4 LOCATED IN
## NE QUARTER OF SECTION 5, TOWNSHIP 1 NORTH, RANGE 66 WEST OF 6TH P.M., FORT LUPTON, COUNTY OF WELD, STATE OF COLORADO

# PUD SITE PLAN

## KEY CONTACTS

OWNER:

LUPTON LAND, LLC (303) 587–1966
10221 PRESTWICK TRAIL
LONE TREE, CO 80124
ATTN: BOB QUINETTE

PLANNER/CIVIL ENGINEER/LANDSCAPE ARCHITECT

JR ENGINEERING (970) 305–6754
2900 SOUTH COLLEGE AVENUE, SUITE 3D
FORT COLLINS, CO 80525
ATTN: KEN MERRITT

CITY

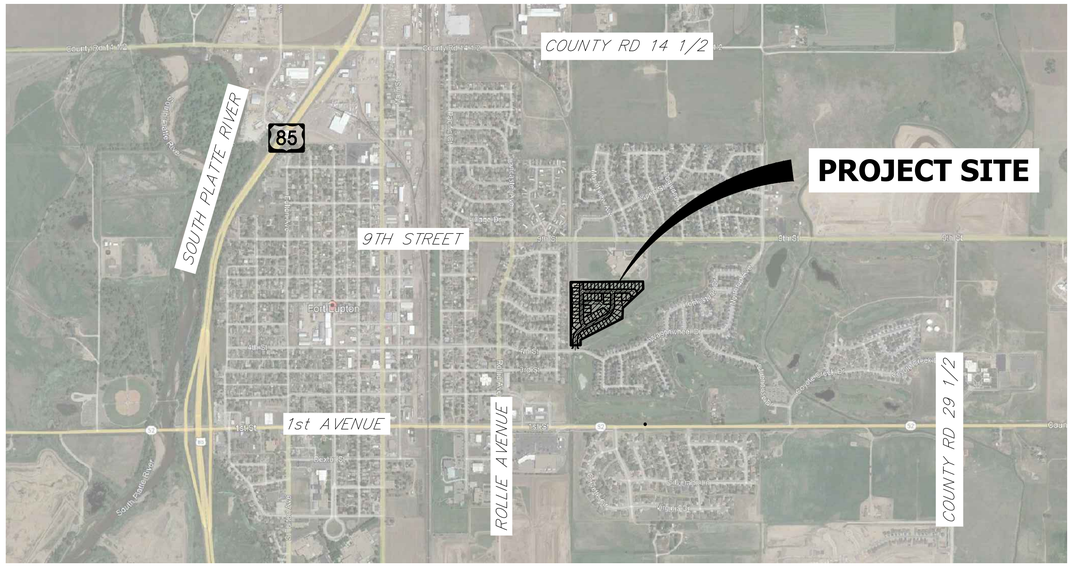
CITY OF FORT LUPTON, ENGINEERING (720) 466–6106
130 SOUTH McKINLEY AVENUE
FORT LUPTON, CO 80621
ATTN: TODD HODGES

## BENCHMARK:

WELD COUNTY BENCHMARK 4907, 3–3/4" PIPE CAP ON PIPE APPROXIMATELY 90 FEET WEST OF THE WESTERLY MOST RAILROAD TRACK AND 26 FEET SOUTH OF THE CENTERLINE OF 9TH STREET, ELEVATION=4908.22 (NAVD88)

## BASIS OF BEARING:

THE WEST LINE OF THE NORTHEAST QUARTER OF SECTION 5, TOWNSHIP 1 NORTH, RANGE 66 WEST OF THE 6TH PRINCIPAL MERIDIAN, BEING MONUMENTED AT THE NORTH END BY A 3–1/4" ALUMINUM CAP STAMPED "1/4 2003 PLS 14823" IN A RANGE BOX AND AT THE SOUTH END BY A #6 REBAR WITH 3–1/4" ALUMINUM CAP STAMP ILLEGIBLE OFF TO THE SIDE IN A RANGE BOX, BEARING N00°16'07"W AS REFERENCED TO COLORADO STATE PLANE NORTH ZONE.




PROJECT LOCATION MAP
SCALE: 1" = 1000'

## SHEET INDEX


| | | |
|---|---|---|
| 1 | – | COVER SHEET |
| 2 | – | PRELIMINARY PLAT |
| 3 | – | PRELIMINARY SITE PLAN |
| 4 | – | PRELIMINARY GRADING & EROSION CONTROL PLAN |
| 5 | – | PRELIMINARY DRAINAGE PLAN |
| 6 | – | PRELIMINARY UTILITY PLAN |
| 7–9 | – | PRELIMINARY STREET PLAN AND PROFILE |
| 10–11 | – | LANDSCAPE PLAN |
| 12–27 | – | PRODUCT ELEVATIONS & PLANS |

TOTAL – 27


## LAND SUMMARY CHART

EXISTING ZONING – PUD MULTI–FAMILY:193 DWELLING UNITS, 14.9 DU'S/AC
PROPOSED ZONING – PUD SINGLE FAMILY DETACHED RESIDENTIAL
TOTAL SITE AREA – 13.351AC
NUMBER OF LOTS – 59 LOTS
GROSS DENSITY – 4.42 DU'S/AC
MINIMUM LOT SIZE – 5,206 SF
MAXIMUM LOT SIZE – 9,928 SF
AVERAGE LOT SIZE – 5,921 SF

| | | | |
|---|---|---|---|
| SINGLE FAMILY LOT AREA | 349,334SF | 8.0196AC | 60.0% OF SITE AREA |
| OPEN SPACE (TRACTS A–E) | 64,155SF | 1.4728AC | 11.0% OF SITE AREA |
| PARK SPACE (TRACT F) PUBLIC LAND DEDICATION | 44,213SF | 1.015AC | 7.70% OF SITE AREA |
| PUBLIC ROW | 123,866SF | 2.8436AC | 21.3% OF SITE AREA |
| TOTAL | 581,568SF | 13.351AC | 100% OF SITE AREA |

## SETBACK REQUIREMENTS

| | |
|---|---|
| FRONT SETBACK | 20' HOUSE / GARAGE |
| REAR YARD SETBACK | 20' |
| SIDE ACCESS SETBACK | 5' |
| CORNER SIDE YARD SETBACK AT ROW | 15' |

## PLAT NOTES

PRIOR TO FURTHER DEVELOPMENT OF COMMERCIAL BLOCKS/LOTS OR DEVELOPMENT OF RESIDENTIAL BLOCKS, A PRE–APPLICATION MEETING WILL BE REQUIRED TO DETERMINE THE APPROPRIATE LAND USE PROCESS. ANY FURTHER DIVISION OF BLOCKS MAY REQUIRE PRELIMINARY PLAT AND FINAL PLAT PROCESSES.

## DESIGN STANDARDS

NO HOME MODEL ELEVATION SHALL BE REPEATED MORE THAN ONCE EVERY THIRD (3RD) LOTS ON THE SAME SIDE OF THE STREET (E.G. THE FIRST AND FOURTH LOTS IN A ROW MAY CONTAIN THE SAME MODEL ELEVATION, BUT THE SECOND AND THIRD LOT MUST CONTAIN TWO (2) DIFFERENT MODEL ELEVATIONS.

ALL STREET FACING GARAGE DOORS ON GARAGES ATTACHED TO PRINCIPAL DWELLING STRUCTURES SHALL HAVE THE ABILITY TO BE PROUD OF THE FRONT FACADE OF THE DWELLING PORTION OF THE STRUCTURE AND/OR FRONT PORCH.

GARAGE DOORS SHALL NOT COMPRISE MORE THAN FORTY–SEVEN (47) PERCENT OF THE FRONT FACADE OF THE PRINCIPAL DWELLING STRUCTURE FOR TWO–CAR GARAGES NOR MORE THAN FIFTY–FIVE (55) PERCENT FOR THREE–CAR GARAGES.

ALL HOMES WILL INCORPORATE A SINGLE EARTH–TONED ASPHALT SHINGLE COLOR THAT WILL HARMONIZE WITH ALL EXTERIOR COLOR PALETTES WITHIN THE SUBDIVISION.

## FENCING STANDARDS

FENCES SHALL BE CONSTRUCTED PER THE FORT LUPTON MUNICIPAL CODE, EXCEPT THAT CHAIN LINK/WOVEN WIRE FENCES ARE NOT AN ALLOWED MATERIAL. (SEE DETAIL SHEET 11)

## UTILITY MAINTENANCE STATEMENT

ALL PUBLIC WATER , STORM SEWER AND SANITARY SEWER MAINS AND APPURTENANCES LOCATED IN PUBLIC ROW SHALL BE MAINTAINED BY THE CITY OF FORT LUPTON PUBLIC WORKS DEPARTMENT. ALL PUBLIC WATER , STORM SEWER, SANITARY SEWER MAINS AND APPURTENANCE S UNDER PRIVATE DRIVES ARE LOCATED IN UTILITY EASEMENTS. CITY IS RESPONSIBLE FOR MAINTENANCE OF THESE WATER,STORM AND SANITARY SEWER FACILITIES. CITY IS NOT RESPONSIBLE FOR REPAIR OR REPLACEMENT OF PRIVATE DRIVE, CURB AND GUTTER OR LANDSCAPING DAMAGED DURING UTILITY REPAIR OR MAINTENANCE.

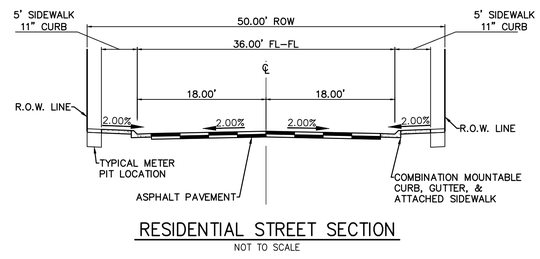
## P.U.D. LAND USE STANDARDS

SINGLE–FAMILY USES AND DENSITIES MAY BE ALLOWED ON PROPERTIES DESIGNATED MULTI–FAMILY.

SINGLE–FAMILY USES ON STANDARD LOTS. INCLUDING THE NECESSARY APPURTENANT AND ACCESSORY FACILITIES AND USES ASSOCIATED WITH SUCH LIVING AREAS. NO BUILDING OR LAND SHALL BE USED AND NO BUILDING SHALL BE HEREAFTER ERECTED OR STRUCTURALLY ALTERED , UNLESS OTHERWISE PROVIDED FOR IN THIS P.U.D., EXCEPT FOR SINGLE–FAMILY DWELLINGS. INCLUDING HOMES BUILT ON SITE . SINGLE–FAMILY DWELLINGS MAY INCLUDE HOME OCCUPATIONS.

ACCESSORY BUILDINGS TYPICALLY FOUND WITH THE ABOVE–PERMITTED USES SHALL BE ALLOWED.AN ACCESSORY BUILDING OR UTILITY SHED MAY NOT BE LOCATED SO AS TO ENCROACH ON ADJACENT PUBLIC OR PRIVATE PROPERTY OR EASEMENTS. IN NO INSTANCE SHALL AN ACCESSORY BUILDING OR UTILITY SHED BE PERMITTED IN THE FRONT YARD. SAID BUILDINGS SHALL BE SET BACK A MINIMUM OF TWENTY (20) FEET FROM ANY SIDE STREET ON A CORNER LOT. ONLY ONE (1) ACCESSORY BUILDING PER PLATTED LOT IS ALLOWED . ACCESSORY STRUCTURES SHALL ONLY BE ALLOWED AFTER THE PRINCIPAL DWELLING HAS BEEN PERMITTED AND CONSTRUCTED ON THE LOT. UTILITY SHEDS SHALL NOT BE CONSIDERED ACCESSORY BUILDINGS. BUT MAY NOT EXCEED 250 S.F. GFA.

BUILDING WALLS SHALL NOT BE WITHIN THE DEFINED SETBACKS AND EASEMENTS . ROOF OVERHANGS , CANTILEVERS , WINDOW WELLS AND FOOTERS MAY EXTEND THREE FEET OVER SETBACK LINES WHERE NOT ENCROACHING UPON EASEMENTS . REFER TO ARTICLE V SEC. 16–101 OF THE CITY OF FORT LUPTON MUNICIPAL CODE FOR GENERAL FENCING PROVISIONS. FENCING SHALL BE VINYL WITH COLOR APPROVED BY FORT LUPTON PLANNING DEPARTMENT PRIOR TO INSTALLATION.




RESIDENTIAL STREET SECTION
NOT TO SCALE

811 Know what's below. Call before you dig.

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PREPARED FOR
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BOB QUINETTE
303–587–1966

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H–SCALE N/A
V–SCALE N/A
DATE 11/17/21
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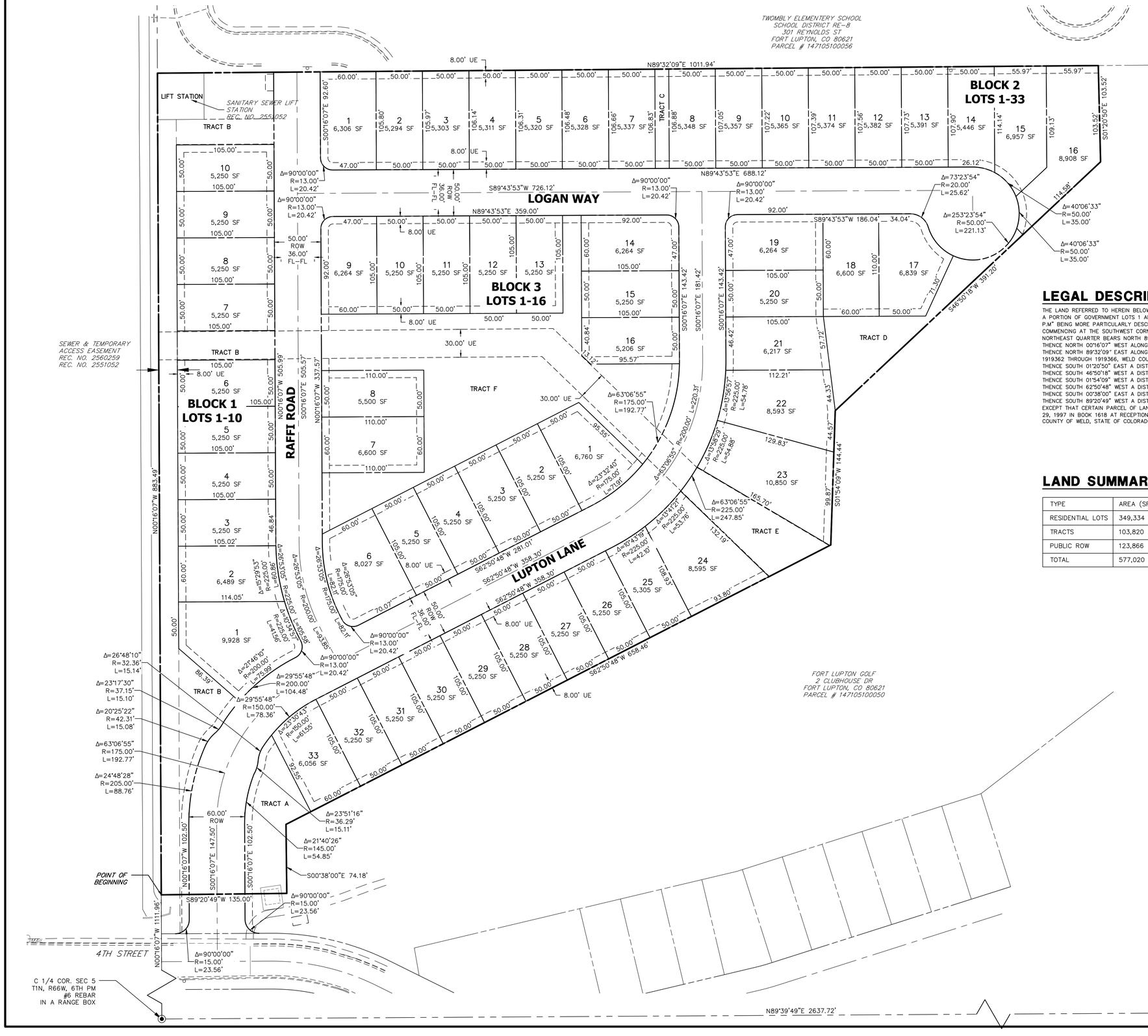
COYOTE CREEK FILING NO. 4
COVER SHEET

SHEET 1 OF 27
JOB NO. 16093.00




## LEGAL DESCRIPTION

THE LAND REFERRED TO HEREIN BELOW IS SITUATED IN THE COUNTY OF WELD, STATE OF COLORADO, AND IS DESCRIBED AS FOLLOWS:
A PORTION OF GOVERNMENT LOTS 1 AND 2 OF THE NORTHEAST QUARTER OF SECTION 5, TOWNSHIP 1 NORTH, RANGE 66 WEST OF THE 6TH P.M" BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:
COMMENCING AT THE SOUTHWEST CORNER OF SAID NORTHEAST QUARTER OF SECTION 5, WHENCE THE SOUTHEAST CORNER OF SAID NORTHEAST QUARTER BEARS NORTH 89°39'49" EAST A DISTANCE OF 2637.72 FEET.;
THENCE NORTH 00°16'07" WEST ALONG THE WESTERLY LINE OF SAID NORTHEAST QUARTER A DISTANCE OF 883.49 FEET;
THENCE NORTH 89°32'09" EAST ALONG THE SOUTHERLY LINE OF THE PARCEL OF LAND DESCRIBED IN BOOK 990, RECEPTION NUMBERS 1919362 THROUGH 1919366, WELD COUNTY CLERK AND RECORDER'S OFFICE, A DISTANCE OF 1011.94 FEET;
THENCE SOUTH 01°20'50" EAST A DISTANCE OF 103.52 FEET ;
THENCE SOUTH 46°50'18" WEST A DISTANCE OF 391.20 FEET;
THENCE SOUTH 01°54'09" WEST A DISTANCE OF 144.44 FEET;
THENCE SOUTH 62°50'48" WEST A DISTANCE OF 658.46 FEET;
THENCE SOUTH 00°38'00" EAST A DISTANCE OF 74.18 FEET;
THENCE SOUTH 89°20'49" WEST A DISTANCE OF 135 FEET TO THE POINT OF BEGINNING.
EXCEPT THAT CERTAIN PARCEL OF LAND (LIFT STATION SITE) AS CONVEYED TO THE CITY OF FORT LUPTON IN WARRANTY DEED RECORDED JULY 29, 1997 IN BOOK 1618 AT RECEPTION NO. 2560260,
COUNTY OF WELD, STATE OF COLORADO.

## LAND SUMMARY CHART

| TYPE | AREA (SF) | AREA (AC) |
|---|---|---|
| RESIDENTIAL LOTS | 349,334 | 8.0196 |
| TRACTS | 103,820 | 2.3834 |
| PUBLIC ROW | 123,866 | 2.8436 |
| TOTAL | 577,020 | 13.2466 |

50 25 0 50 100
ORIGINAL SCALE: 1" = 50'

Know what's **below.** **Call** before you dig.

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| H-SCALE | 1"=50' | DESIGNED BY | ANI |
| V-SCALE | 1"=X' | DRAWN BY | ANI |
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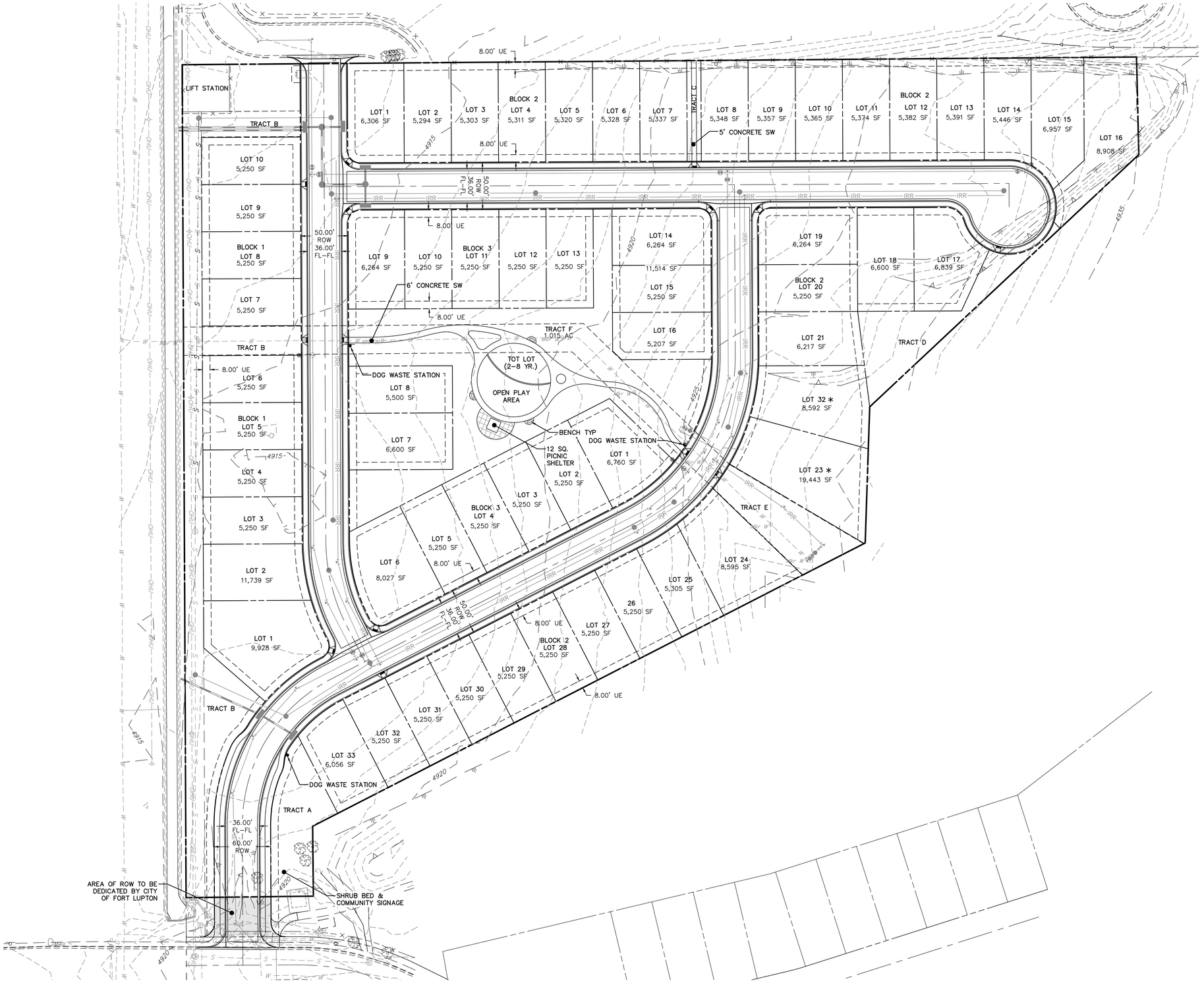
# COYOTE CREEK FILING NO. 4

## PRELIMINARY PLAT

SHEET 2 OF 27
JOB NO. 16093.00

# COYOTE CREEK FILING NO. 4




## SITE LEGEND

- BOUNDARY LINE
- PROPERTY LINE
- EXISTING EASEMENT LINE
- PROPOSED EASEMENT LINE
- RIGHT OF WAY
- EXISTING WOODEN FENCE
- EXISTING GAS MAIN
- EXISTING SANITARY SEWER
- PROPOSED SANITARY SEWER
- EXISTING WATER MAIN
- PROPOSED WATER MAIN
- PROPOSED ELECTRIC
- EXISTING STORM DRAIN
- PROPOSED STORM DRAIN
- EXISTING CURB AND GUTTER
- PROPOSED SIGN
- PROPOSED CURB AND GUTTER
- EXISTING STREET LIGHTS
- PROPOSED STREET LIGHT
- 3/4" METER VAULTS
- FIRE HYDRANT

50 25 0 50 100

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| V-SCALE | 1"=X' |
| DATE | 11/17/21 |
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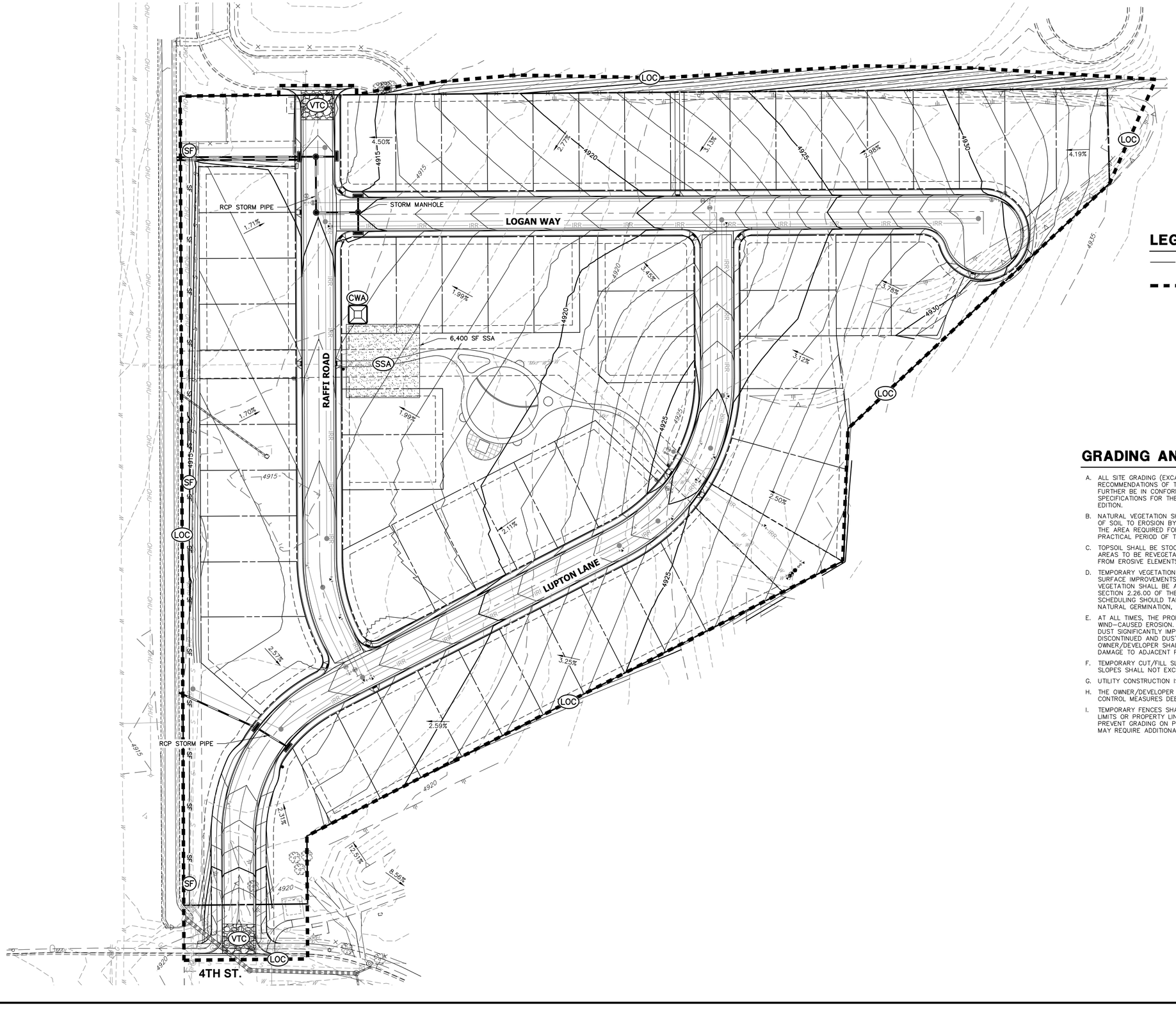
COYOTE CREEK FILING NO. 4

PRELIMINARY SITE PLAN

SHEET 3 OF 27

JOB NO. 16093.00

# COYOTE CREEK FILING NO. 4




## LEGEND

- SF — SILT FENCE
- LOC — LIMITS OF CONSTRUCTION
- VTC — VEHICLE TRACKING CONTROL
- CWA — CONCRETE WASHOUT AREA
- IP — INLET PROTECTION
- SCL — SEDIMENT CONTROL LOG
- SSA — STABILIZED STAGING AREA

## GRADING AND EROSION CONTROL NOTES

A. ALL SITE GRADING (EXCAVATION, EMBANKMENT, AND COMPACTION) SHALL CONFORM TO THE RECOMMENDATIONS OF THE LATEST SOILS INVESTIGATION FOR THIS PROPERTY AND SHALL FURTHER BE IN CONFORMANCE WITH THE CITY OF FORT LUPTON'S "STANDARDS AND SPECIFICATIONS FOR THE DESIGN AND CONSTRUCTION OF PUBLIC IMPROVEMENTS," LATEST EDITION.

B. NATURAL VEGETATION SHALL BE RETAINED AND PROTECTED WHEREVER POSSIBLE. EXPOSURE OF SOIL TO EROSION BY REMOVAL OR DISTURBANCE OF VEGETATION SHALL BE LIMITED TO THE AREA REQUIRED FOR IMMEDIATE CONSTRUCTION OPERATION AND FOR THE SHORTEST PRACTICAL PERIOD OF TIME.

C. TOPSOIL SHALL BE STOCKPILED TO THE EXTENT PRACTICABLE ON THE SITE FOR USE ON AREAS TO BE REVEGETATED. ANY AND ALL STOCKPILES SHALL BE LOCATED AND PROTECTED FROM EROSIVE ELEMENTS.

D. TEMPORARY VEGETATION SHALL BE INSTALLED ON ALL DISTURBED AREAS WHERE PERMANENT SURFACE IMPROVEMENTS ARE NOT SCHEDULED FOR INSTALLATION WITHIN THREE MONTHS. VEGETATION SHALL BE A VIGOROUS, DROUGHT TOLERANT, NATIVE SPECIES MIX. (REFER TO SECTION 2.26.00 OF THESE STANDARDS AND SPECIFICATIONS FOR SEEDING MIX.) PROJECT SCHEDULING SHOULD TAKE ADVANTAGE OF SPRING OR FALL PLANTING SEASONS FOR NATURAL GERMINATION, BUT SEEDED AREAS SHALL BE IRRIGATED, IF CONDITIONS SO MERIT.

E. AT ALL TIMES, THE PROPERTY SHALL BE MAINTAINED AND/OR WATERED TO PREVENT WIND-CAUSED EROSION. EARTHWORK OPERATIONS SHALL BE DISCONTINUED WHEN FUGITIVE DUST SIGNIFICANTLY IMPACTS ADJACENT PROPERTY. IF EARTHWORK IS COMPLETE OR DISCONTINUED AND DUST FROM THE SITE CONTINUES TO CREATE PROBLEMS, THE OWNER/DEVELOPER SHALL IMMEDIATELY INSTITUTE MITIGATIVE MEASURES AND SHALL CORRECT DAMAGE TO ADJACENT PROPERTY.

F. TEMPORARY CUT/FILL SLOPES SHALL NOT EXCEED A STEEPNESS OF 2:1 (2H:1V). PERMANENT SLOPES SHALL NOT EXCEED 4:1 (4H:1V) IN AREAS TO BE SEEDED OR SODDED.

G. UTILITY CONSTRUCTION IS NOT APPROVED UNDER THIS PLAN.

H. THE OWNER/DEVELOPER SHALL PROVIDE ANY ADDITIONAL DUST ABATEMENT AND EROSION CONTROL MEASURES DEEMED NECESSARY BY THE CITY, SHOULD CONDITIONS MERIT THEM.

I. TEMPORARY FENCES SHALL BE INSTALLED ALONG ALL BOUNDARIES OF THE CONSTRUCTION LIMITS OR PROPERTY LINES AS SHOWN ON THE APPROVED EROSION CONTROL PLAN, TO PREVENT GRADING ON PROPERTY NOT OWNED BY THE DEVELOPER. IN ADDITION, THE CITY MAY REQUIRE ADDITIONAL TEMPORARY FENCES IF FIELD CONDITIONS SO MERIT THEM.

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ORIGINAL SCALE: 1" = 50'

Know what's **below.**
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P-303.587.1966


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| V-SCALE | N/A |
| DATE | 11/17/21 |
| DESIGNED BY | AJH |
| DRAWN BY | CRB |
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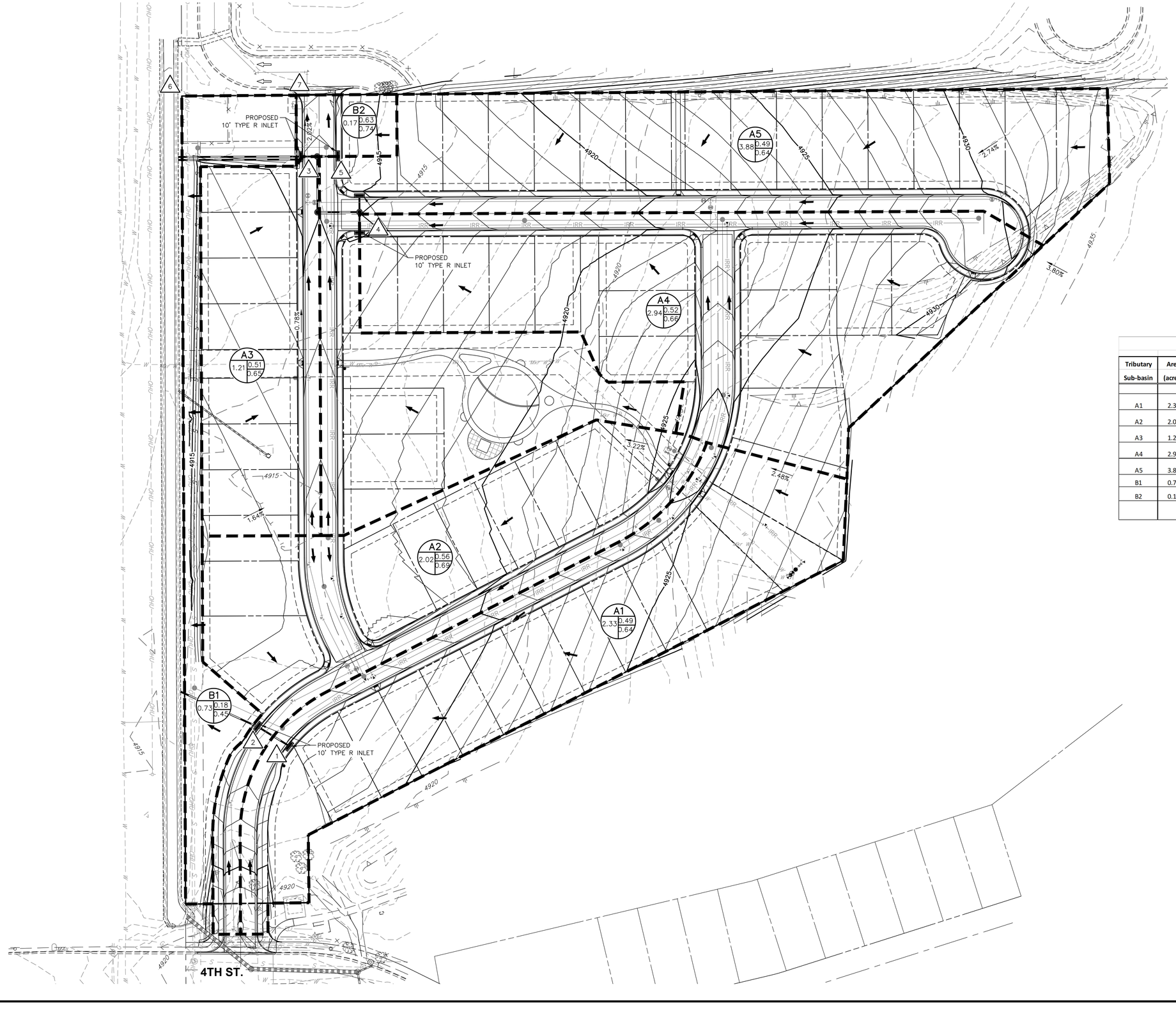
COYOTE CREEK FILING NO. 4

PRELIMINARY GRADING & EROSION CONTROL PLAN

SHEET 4 OF 27

JOB NO. 16093.00

# COYOTE CREEK FILING NO. 4




**BASIN SUMMARY TABLE**

| Tributary Sub-basin | Area (acres) | Percent Impervious | $C_5$ | $C_{100}$ | $t_c$ (min) | $Q_5$ (cfs) | $Q_{100}$ (cfs) |
|---|---|---|---|---|---|---|---|
| A1 | 2.33 | 52% | 0.49 | 0.64 | 13.0 | 3.9 | 9.8 |
| A2 | 2.02 | 61% | 0.56 | 0.69 | 11.6 | 4.1 | 9.7 |
| A3 | 1.21 | 56% | 0.51 | 0.65 | 12.0 | 2.2 | 5.4 |
| A4 | 2.94 | 56% | 0.52 | 0.66 | 11.1 | 5.7 | 13.8 |
| A5 | 3.88 | 51% | 0.49 | 0.64 | 13.7 | 6.4 | 16.1 |
| B1 | 0.73 | 7% | 0.18 | 0.45 | 13.8 | 0.4 | 2.1 |
| B2 | 0.17 | 69% | 0.63 | 0.74 | 5.0 | 0.5 | 1.2 |

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| DATE | 11/17/21 |
| DESIGNED BY | AJH |
| DRAWN BY | XXX |
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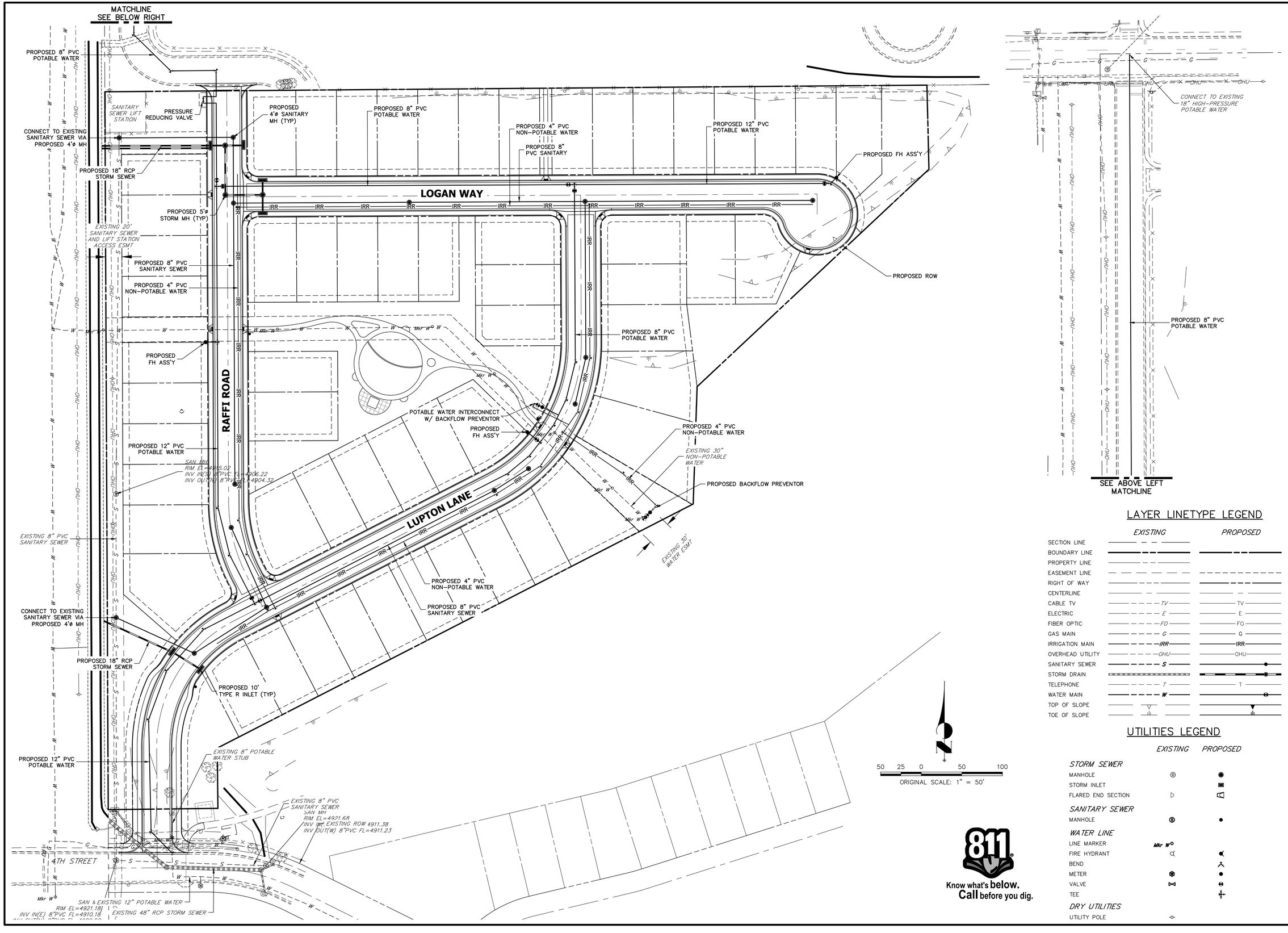
COYOTE CREEK FILING NO. 4

PRELIMINARY DRAINAGE PLAN

SHEET 5 OF 27

JOB NO. 16093.00




## LAYER LINETYPE LEGEND

| | EXISTING | PROPOSED |
|---|---|---|
| SECTION LINE | | |
| BOUNDARY LINE | | |
| PROPERTY LINE | | |
| EASEMENT LINE | | |
| RIGHT OF WAY | | |
| CENTERLINE | | |
| CABLE TV | TV | TV |
| ELECTRIC | E | E |
| FIBER OPTIC | FO | FO |
| GAS MAIN | G | G |
| IRRIGATION MAIN | IRR | IRR |
| OVERHEAD UTILITY | OHU | OHU |
| SANITARY SEWER | S | |
| STORM DRAIN | | |
| TELEPHONE | T | T |
| WATER MAIN | W | |
| TOP OF SLOPE | | |
| TOE OF SLOPE | | |

## UTILITIES LEGEND

| | EXISTING | PROPOSED |
|---|---|---|
| **STORM SEWER** | | |
| MANHOLE | | |
| STORM INLET | | |
| FLARED END SECTION | | |
| **SANITARY SEWER** | | |
| MANHOLE | | |
| **WATER LINE** | | |
| LINE MARKER | Mkr W | |
| FIRE HYDRANT | | |
| BEND | | |
| METER | | |
| VALVE | | |
| TEE | | |
| **DRY UTILITIES** | | |
| UTILITY POLE | | |

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| V-SCALE | N/A | DRAWN BY | SWW |
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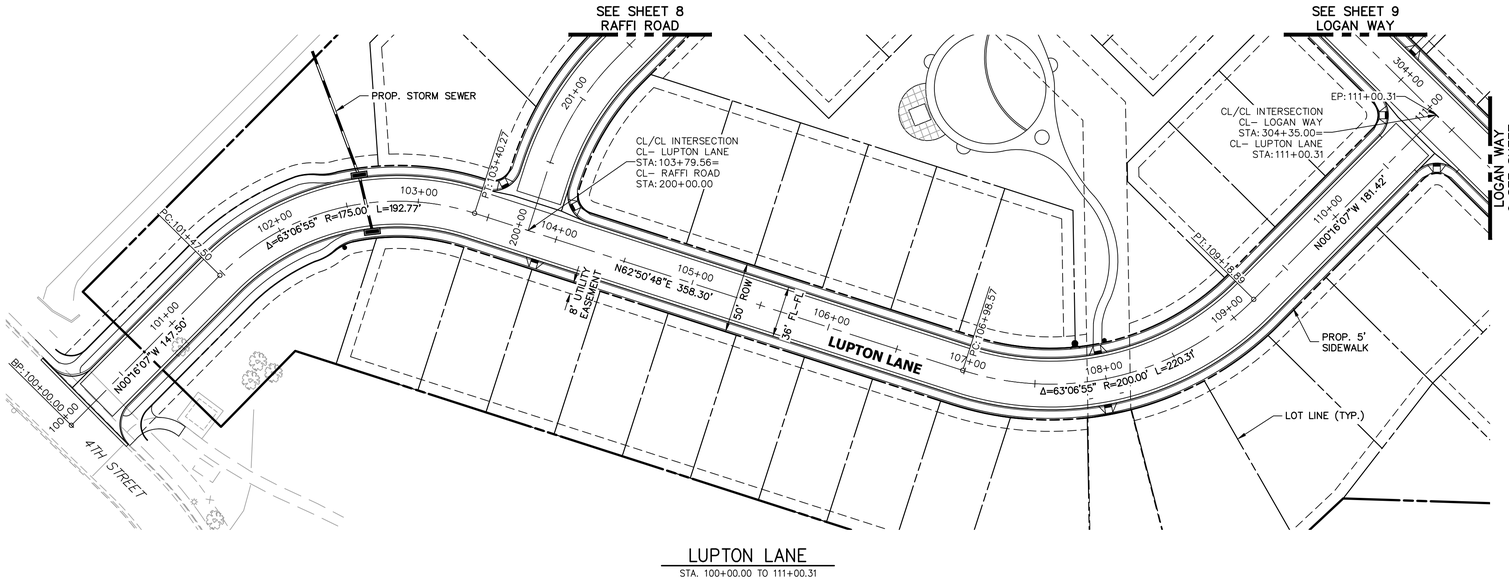
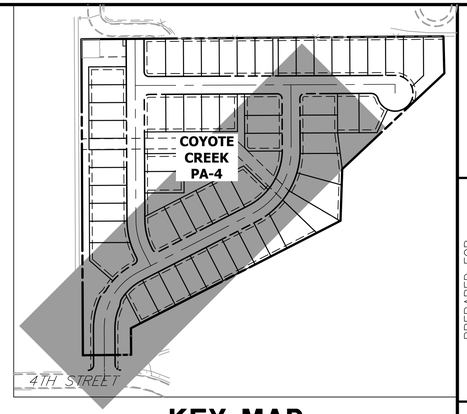
# COYOTE CREEK FILING NO. 4
## PRELIMINARY UTILITY PLAN

SHEET 6 OF 27

JOB NO. 16093.00

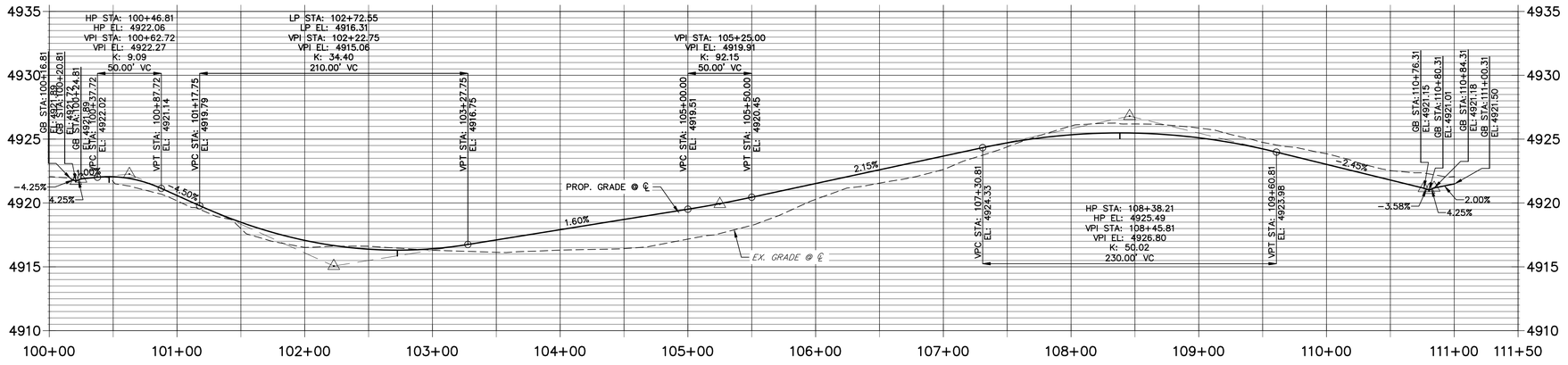


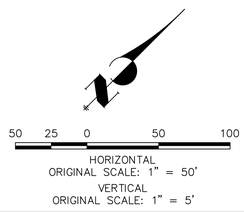

LUPTON LANE
STA. 100+00.00 TO 111+00.31




**KEY MAP**
N.T.S.

## CL- LUPTON LANE PROFILE
## STA 100+00.00 TO 111+50.00

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PREPARED FOR
LUPTON LAND, LLC
10221 PRESTWICK TRAIL
LONE TREE, CO 80124
BOB QUINETTE
P-303.587.1966

J·R ENGINEERING
A Westrian Company
Centennial 303-740-9393 • Colorado Springs 719-593-2593
Fort Collins 970-491-9888 • www.jrengineering.com

| No. | REVISION | BY | DATE |
|---|---|---|---|
| | | | |

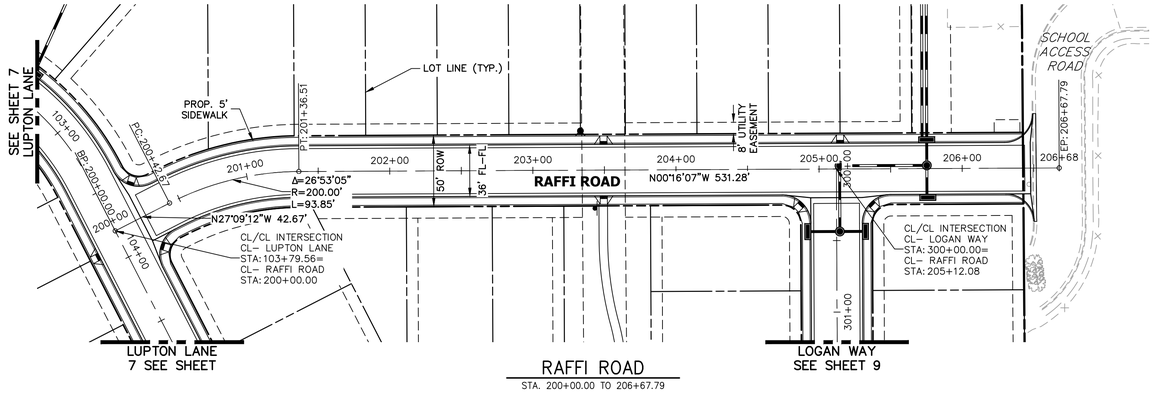
| | |
|---|---|
| H-SCALE | 1"=50' |
| V-SCALE | 1"=5' |
| DATE | 11/17/21 |
| DESIGNED BY | AJH |
| DRAWN BY | CRB |
| CHECKED BY | |

COYOTE CREEK FILING NO 4

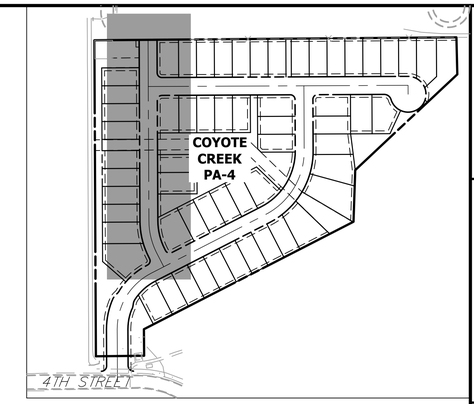
PRELIMINARY STREET PLAN AND PROFILE

SHEET 7 OF 27

JOB NO. 16093.00

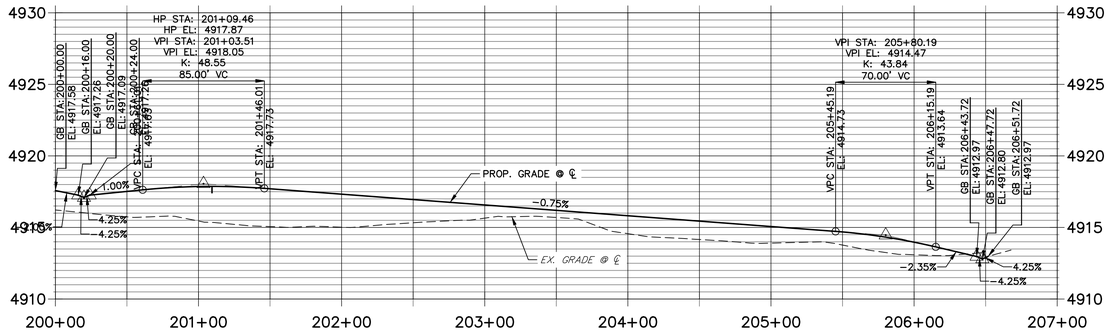



RAFFI ROAD
STA. 200+00.00 TO 206+67.79




**KEY MAP**
N.T.S.

# CL- RAFFI ROAD PROFILE
# STA 200+00.00 TO 207+00.00




HORIZONTAL
ORIGINAL SCALE: 1" = 50'
VERTICAL
ORIGINAL SCALE: 1" = 5'

Know what's below. Call before you dig.

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| No. | REVISION | BY | DATE |
|---|---|---|---|
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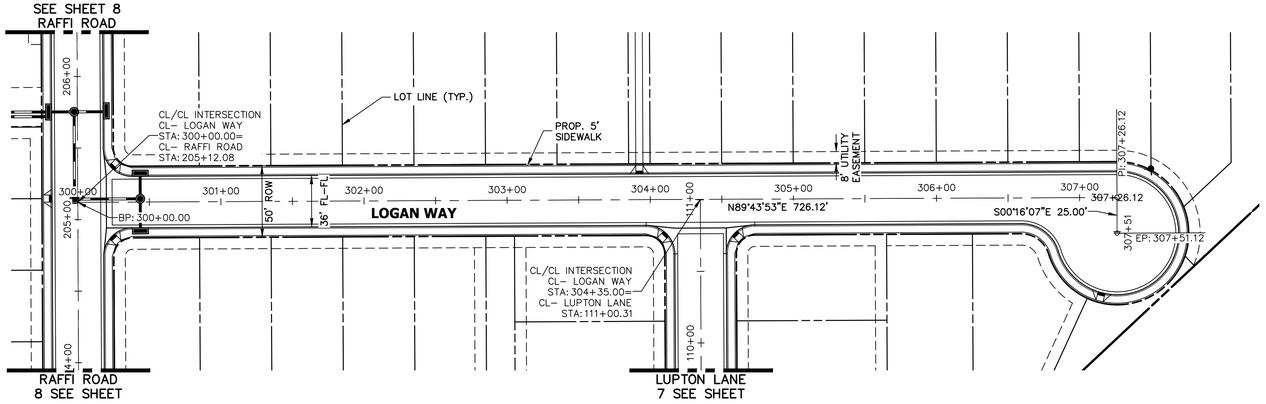
| | | | |
|---|---|---|---|
| H-SCALE | 1"=50' | DESIGNED BY | AJH |
| V-SCALE | 1"=5' | DRAWN BY | CRB |
| DATE | 11/17/21 | CHECKED BY | |

COYOTE CREEK FILING NO 4

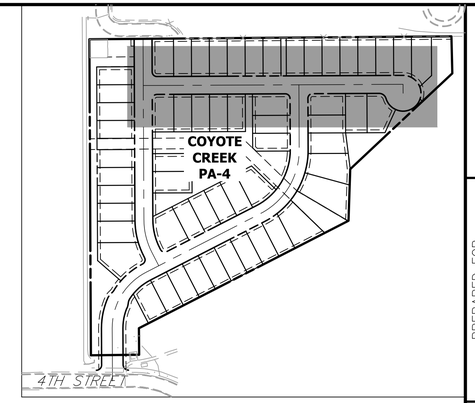
PRELIMINARY STREET PLAN AND PROFILE

SHEET 8 OF 27

JOB NO. 16093.00

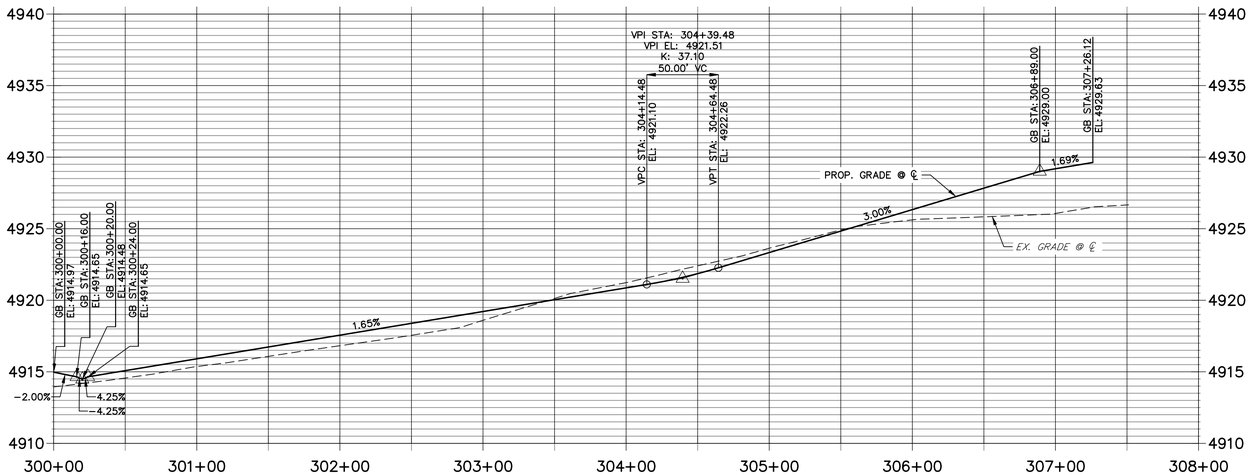



LOGAN WAY
STA. 300+00.00 TO 307+51.12




**KEY MAP**
N.T.S.

## CL- LOGAN WAY PROFILE
## STA 300+00.00 TO 308+00.00



811 Know what's below. Call before you dig.

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| No. | REVISION | BY | DATE |
|---|---|---|---|
| | | | |

| | | | |
|---|---|---|---|
| H-SCALE | 1"=50' | DESIGNED BY | AJH |
| V-SCALE | 1"=5' | DRAWN BY | CRB |
| DATE | 11/17/21 | CHECKED BY | |

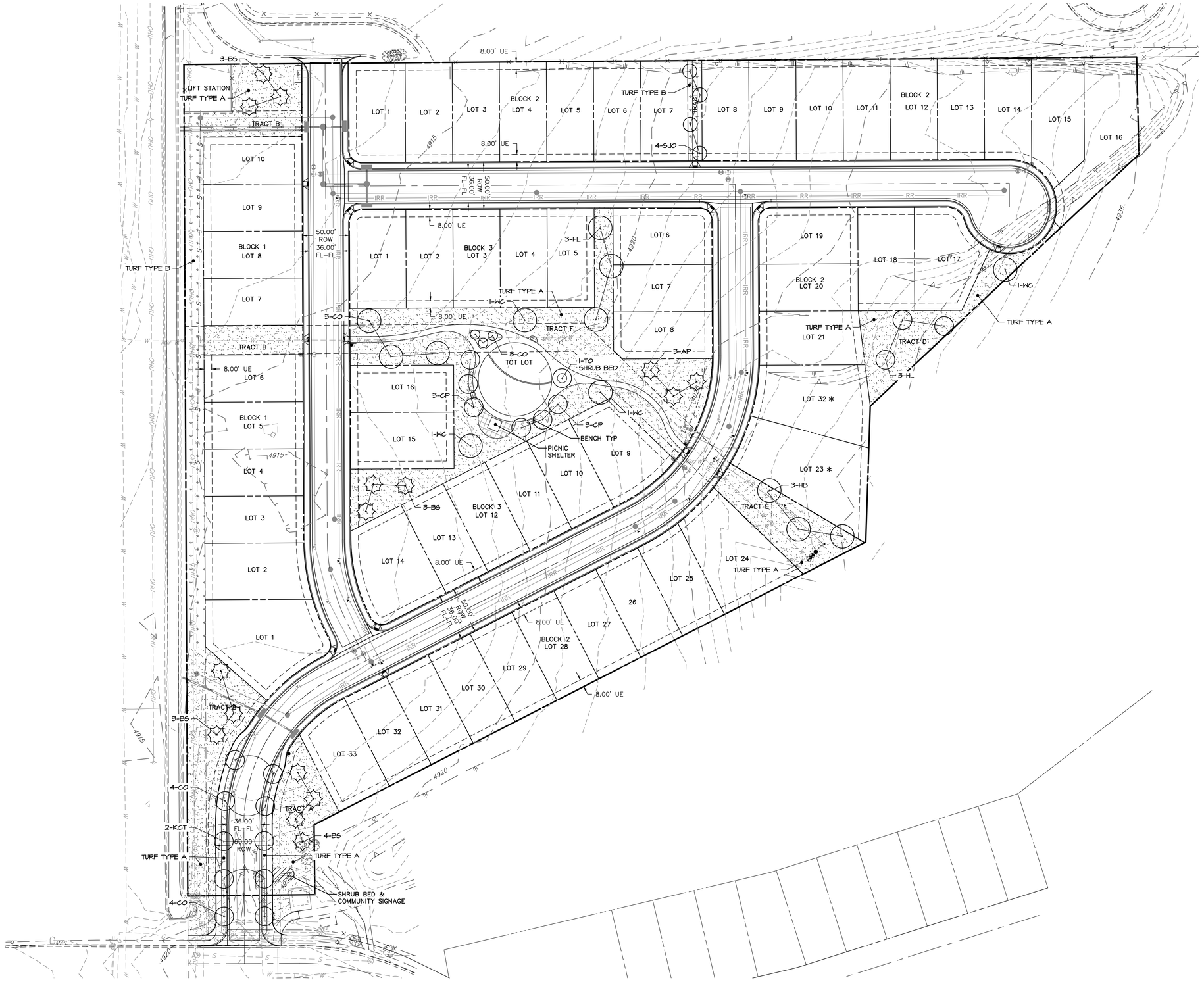
COYOTE CREEK FILING NO 4

PRELIMINARY STREET PLAN AND PROFILE

SHEET 9 OF 27

JOB NO. 16093.00

# COYOTE CREEK FILING NO. 4




## LANDSCAPE LEGEND

- EXISTING CONIFEROUS TREE TO BE PRESERVED
- EXISTING DECIDUOUS TREE TO BE PRESERVED
- PROPOSED MINOR/1' CONTOUR
- PROPOSED MAJOR/5' CONTOUR
- STEEL HEADER
- **TURF TYPE A:** IRRIGATED HYBRID KENTUCKY X TEXAS BLUE GRASS SOD, TURF MASTER ENVIROTURF OR APPROVED EQUAL
- **TURF TYPE B:** DROUGHT TOLERANT IRRIGATED TURF SEED MIX
- CONIFEROUS TREE 6' HGT
- DECIDUOUS STREET/ SHADE TREE, 2" CALIPER
- ORNAMENTAL TREE, 1 1/2" CALIPER SIZE
- STOP SIGN OR PARKING SIGN
- FIRE HYDRANT

## SITE LEGEND

- BOUNDARY LINE
- PROPERTY LINE
- EXISTING EASEMENT LINE
- PROPOSED EASEMENT LINE
- RIGHT OF WAY
- EXISTING WOODEN FENCE
- EXISTING GAS MAIN
- EXISTING SANITARY SEWER
- PROPOSED SANITARY SEWER
- EXISTING WATER MAIN
- PROPOSED WATER MAIN
- PROPOSED ELECTRIC
- EXISTING STORM DRAIN
- PROPOSED STORM DRAIN
- EXISTING CURB AND GUTTER
- PROPOSED SIGN
- PROPOSED CURB AND GUTTER
- EXISTING STREET LIGHTS
- PROPOSED STREET LIGHT
- 3/4" METER VAULTS
- FIRE HYDRANT

50 25 0 50 100

ORIGINAL SCALE: 1" = 50'

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| No. | REVISION | BY | DATE |
|---|---|---|---|
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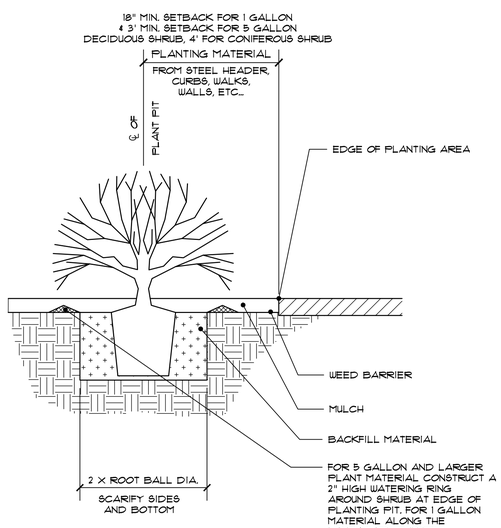
| | |
|---|---|
| H-SCALE | 1"=50' |
| V-SCALE | 1"=X' |
| DATE | 11/17/21 |
| DESIGNED BY | AJH |
| DRAWN BY | XXX |
| CHECKED BY | |

COYOTE CREEK FILING NO. 4

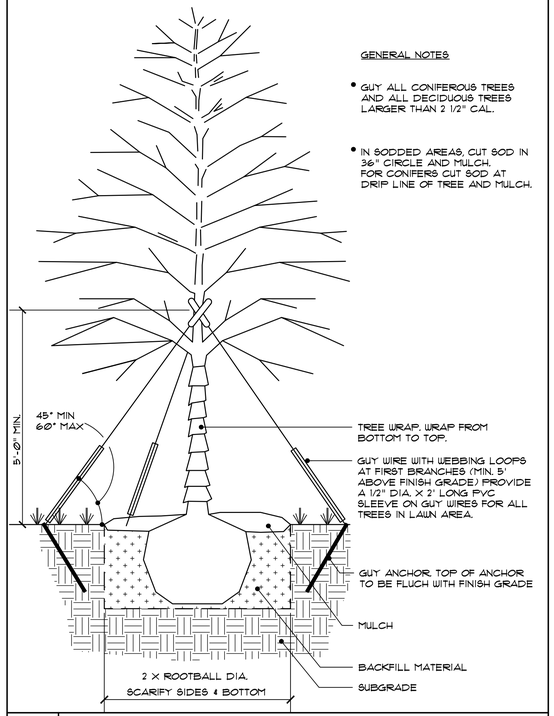
LANDSCAPE PLAN

SHEET 10 OF 27

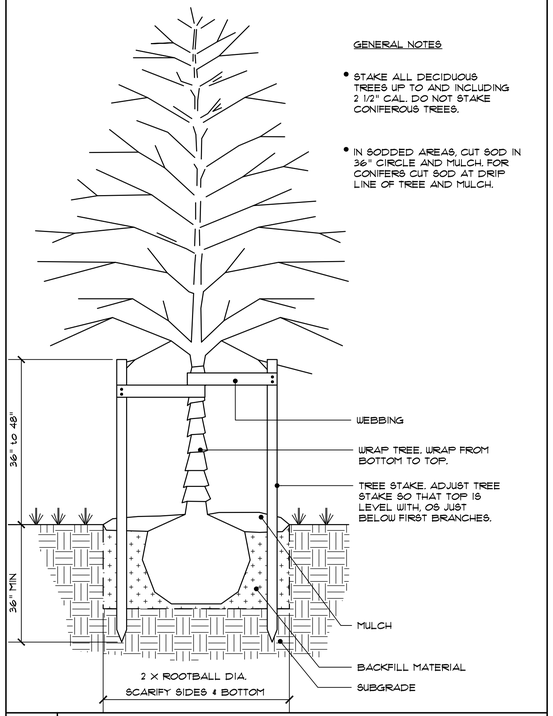
JOB NO. 16093.00



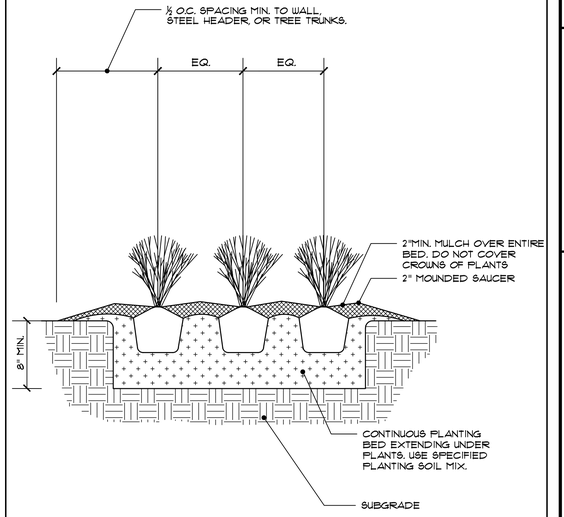

A SHRUB PLANTING



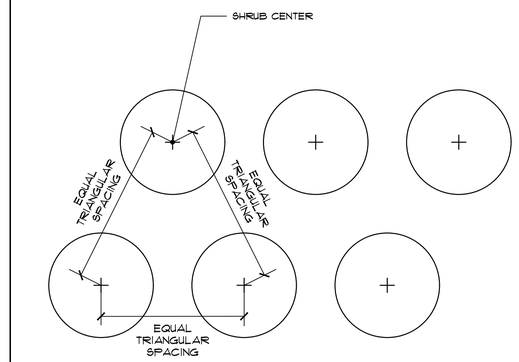

B TREE PLANTING AND GUYING




C TREE PLANTING AND STAKING




D PERENNIAL PLANTING




E TRIANGULAR SHRUB SPACING

## CONIFEROUS TREES

| Quantity | Symbol | Common Name | Botanical Name | Mitigation Size | Cont. | Kc Value | Species Diversity |
|---|---|---|---|---|---|---|---|
| 6 | AP | Autrian Pine | Pinus Nigra | 8' HGT. | B&B | L | |
| 3 | BS | Colorado Blue Spruce | Picea Pungens 'Colorado Blue' | 8' Hgt | B&B | L | |

## DECIDUOUS TREES

| Quantity | Symbol | Common Name | Botanical Name | Size | Cond. | Kc Value | Species Diversity |
|---|---|---|---|---|---|---|---|
| 8 | CO | Chinkapin Oak | Quercus Muehlenbergii | 2" Cal | B&B | M | |
| 3 | HB | Hackberry | Celtis Occidentalis | 2" Cal | B&B | L | |
| 5 | KCT | Kentucky Coffeetree | Gymnocladus Dioicus 'Espresso' | 2" Cal | B&B | L | |
| 3 | WC | Western Catalpa | Capalpa Speciosa | 3" Cal | B&B | L | |
| 1 | TRO | Texas Red Oak | Quercus Buckley | 2" Cal | B&B | L | |
| 4 | SJO | Skinny Jeans Oak | Quercus | 2" Cal | B&B | L | |

## ORNAMENTAL TREES

| Quantity | Symbol | Common Name | Botanical Name | Size | Cond. | Kc Value | Species Diversity |
|---|---|---|---|---|---|---|---|
| 6 | CP | Chanticleer Pear | Pyrus Calleryana 'Chanticleer' | 2" Cal | B&B | M | |
| 3 | ABS | Autumn Brilliance Serviceberry | Amelanchier x 'Autumn Brilliance' | 1 1/2" Cal | B&B | M | |

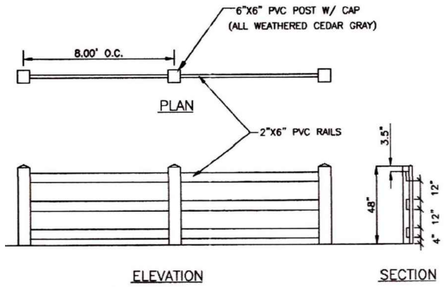
33 **Total Trees** **100%**

## TURF TYPE A:
## DROUGHT TOLERANT IRRIGATED SOD MIX

HYBRID KENTUCKY x TEXAS BLUEGRASS BEING A MIX OF 100% TEXAS BLUEGRASS HYBRID SEED. THE SEED SOURCE & TURF BASED MIX FOR SOD SHALL BE APPROVED BY THE LANDSCAPE ARCHITECT BEFORE INSTALLATION OF SOD.

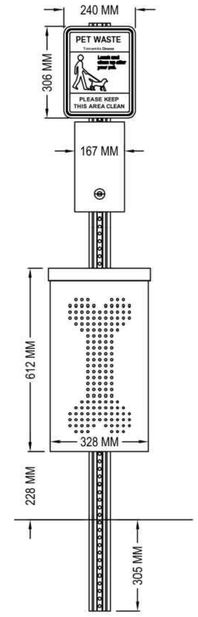
## TURF TYPE B:
## DROUGHT TOLERANT IRRIGATED TURF SEED MIX

30% EPHRAIM CRESTED WHEATGRASS, 25% DWARF PERENNIAL RYSEGRASS, 20% SR3200 BLUE FESCUE, 15% REUBENS CANADA BLUEGRASS, 10% CHEWINGS FESCUE.
**TOTAL: 15 LBS/ACRE (DRILLED) = 55 SEEDS/SF**




## SPLIT RAIL FENCE

SCALE: NTS




## DOG WASTE STATION

SCALE: NTS

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PREPARED FOR
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10221 PRESTWICK TRAIL
LONE TREE, CO 80124
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| BY | No. | REVISION | DATE |
|---|---|---|---|
| | | | |

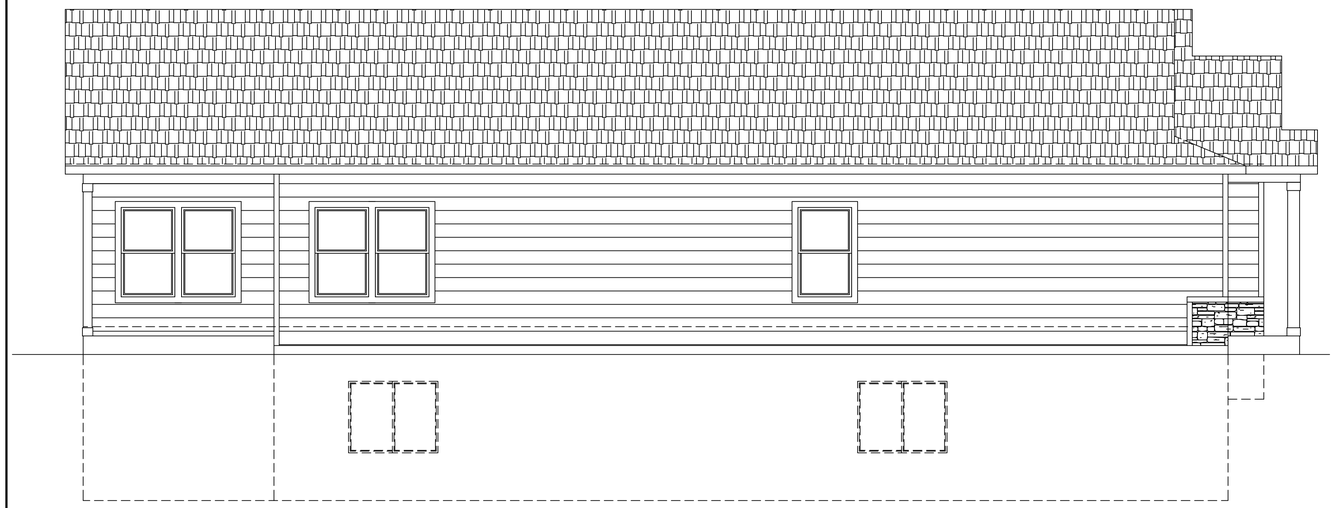
| | |
|---|---|
| H-SCALE | N/A |
| V-SCALE | N/A |
| DATE | 11/17/21 |
| DESIGNED BY | AJH |
| DRAWN BY | AJH |
| CHECKED BY | |

COYOTE CREEK FILING NO. 4

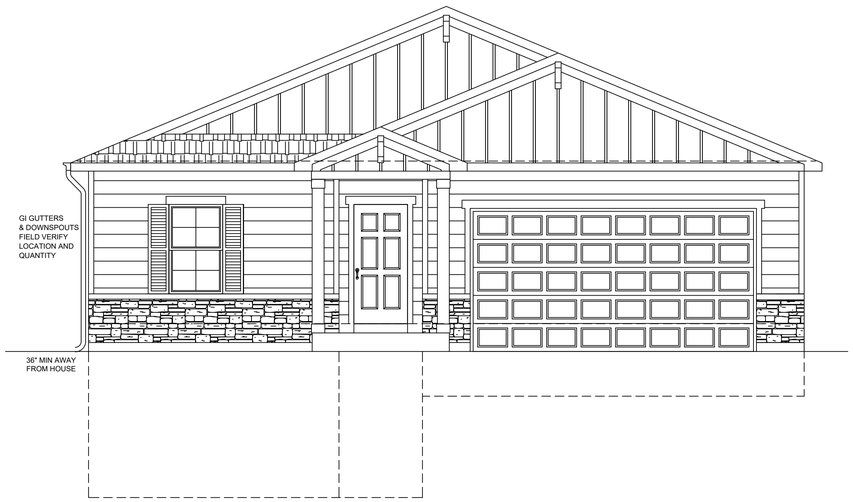
LANDSCAPE DETAILS

SHEET 11 OF 27

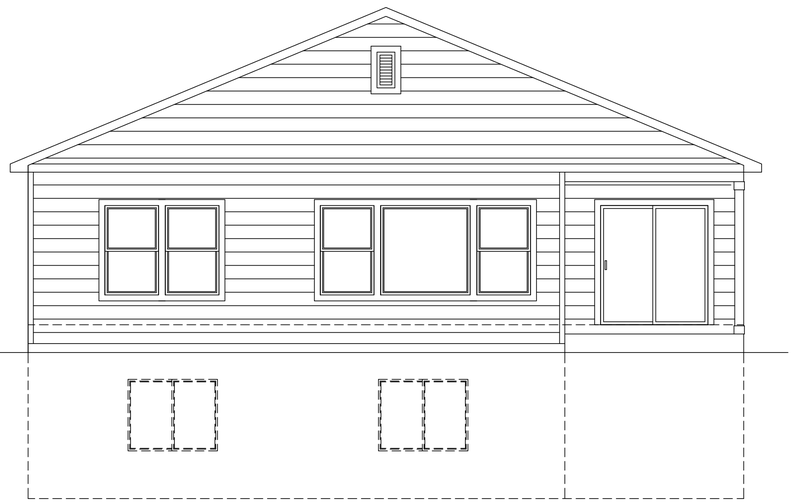
JOB NO. 16093.00



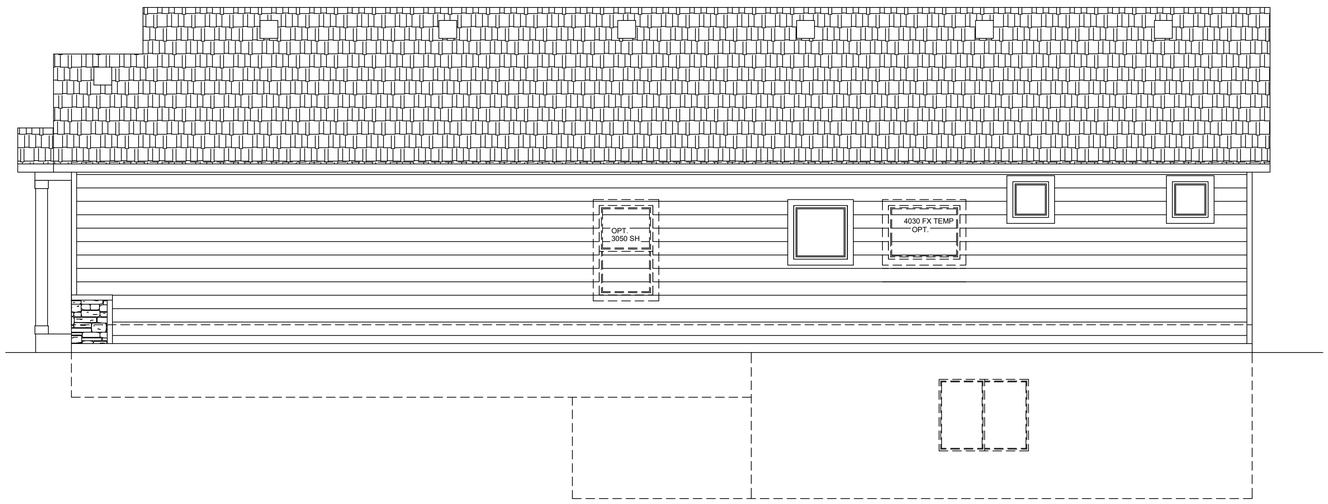
SIDE ELEVATION
1/4"=1'-0"




D1812.1 FRONT ELEVATION-TRADITIONAL
1/4"=1'-0"



REAR ELEVATION
1/4"=1'-0"




GARAGE SIDE ELEVATION
1/4"=1'-0"

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CHALLENGER BUILDING, LLC.
8605 EXPLORER DRIVE
SUITE 250
COLORADO SPRINGS, CO 80920
719-598-5192

SHEET NAME
ELEVATION- TRADITIONAL

PROJECT NAME
MASTER PLAN D1813.1

STAMPS/ENDORSEMENTS

DRAWN BY:
AL

DATE:
8/27/18

SUBMITTALS / REVISIONS

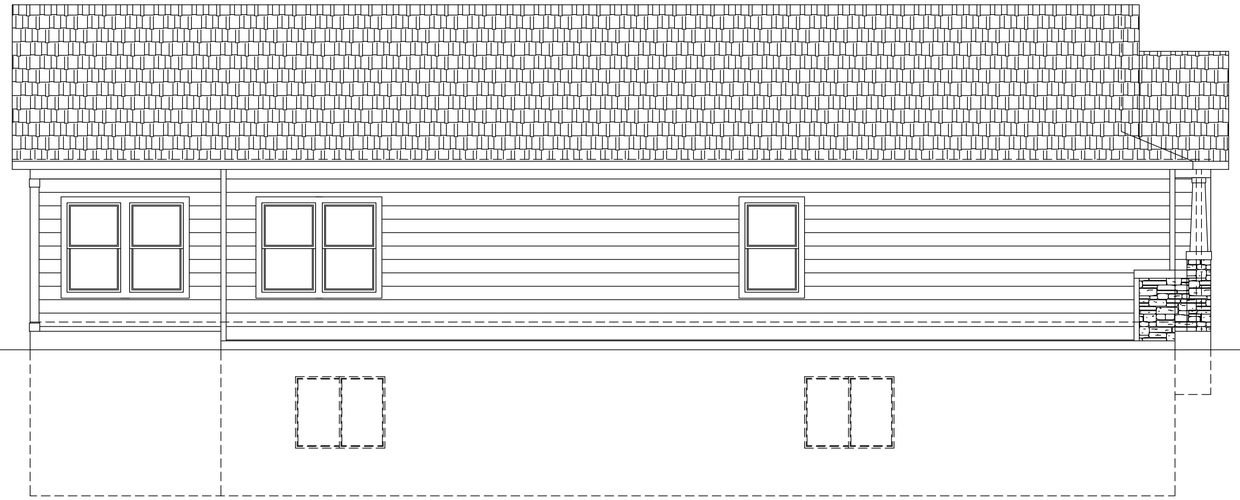
| DATE | TYPE | BY |
|---|---|---|
| | | |

SUBMITTALS / REVISIONS

| DATE | TYPE | BY |
|---|---|---|
| | | |

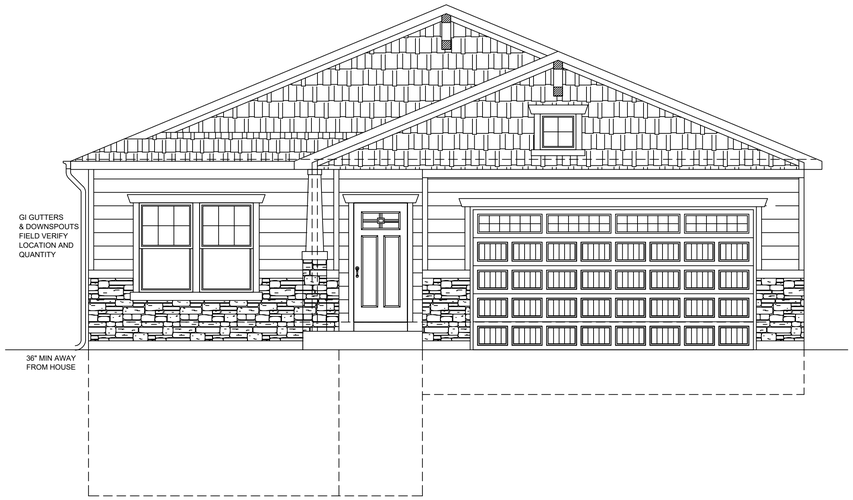
ELEVATION TRAD

SHEET NUMBER
12



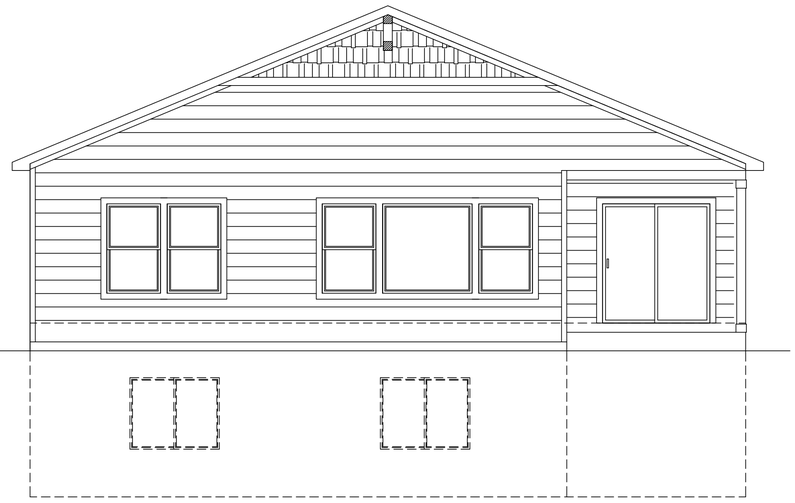
SIDE ELEVATION

1/4"=1'-0"



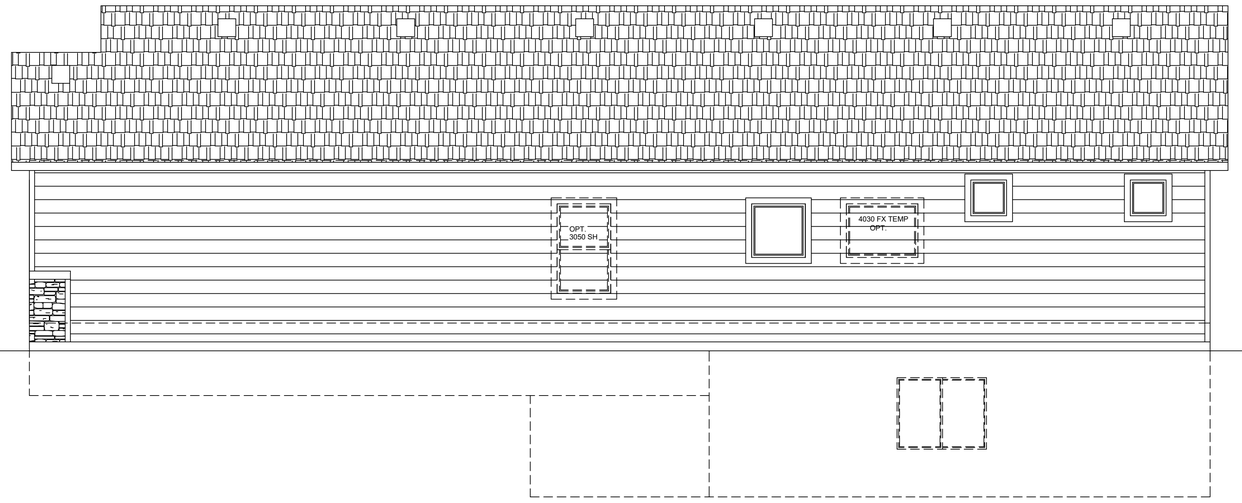

D1813.1 FRONT ELEVATION- CRAFTSMAN

1/4"=1'-0"



REAR ELEVATION

1/4"=1'-0"




GARAGE SIDE ELEVATION

1/4"=1'-0"

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CHALLENGER BUILDING, LLC.
8605 EXPLORER DRIVE
SUITE 250
COLORADO SPRINGS, CO 80920
719-598-5192

SHEET NAME
ELEVATION- CRAFTSMAN

PROJECT NAME
MASTER PLAN D1813.1

STAMPS/ENDORSEMENTS

DRAWN BY:
AL

DATE:
8/27/18

SUBMITTALS / REVISIONS

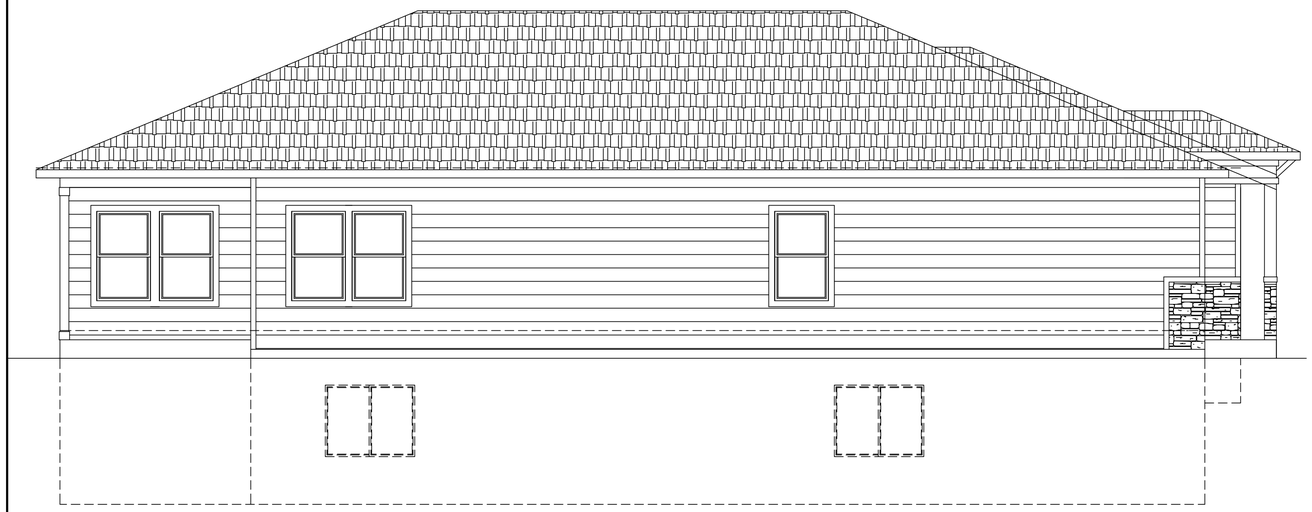
| DATE | TYPE | BY |
|---|---|---|

SUBMITTALS / REVISIONS

| DATE | TYPE | BY |
|---|---|---|

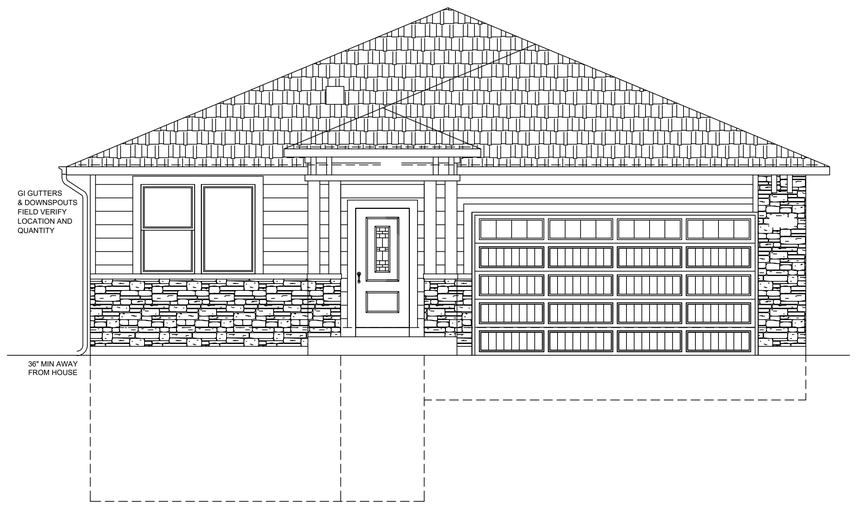
ELEVATION CRAFT.

SHEET NUMBER
13



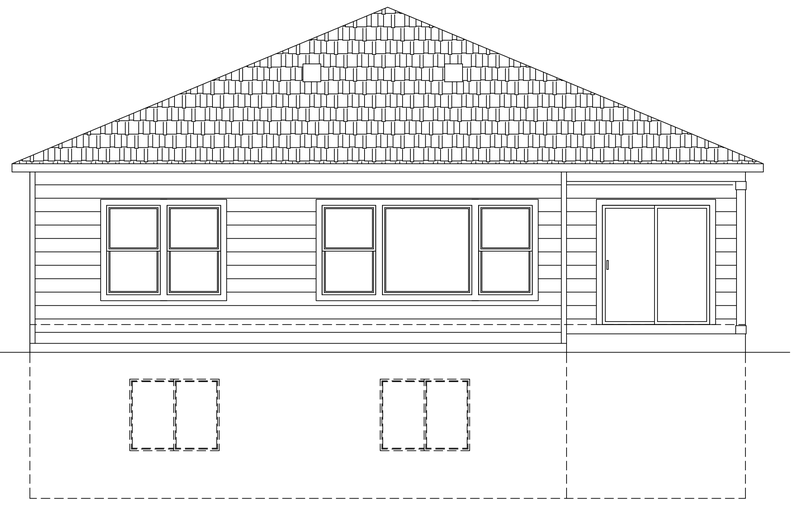
SIDE ELEVATION

1/4"=1'-0"



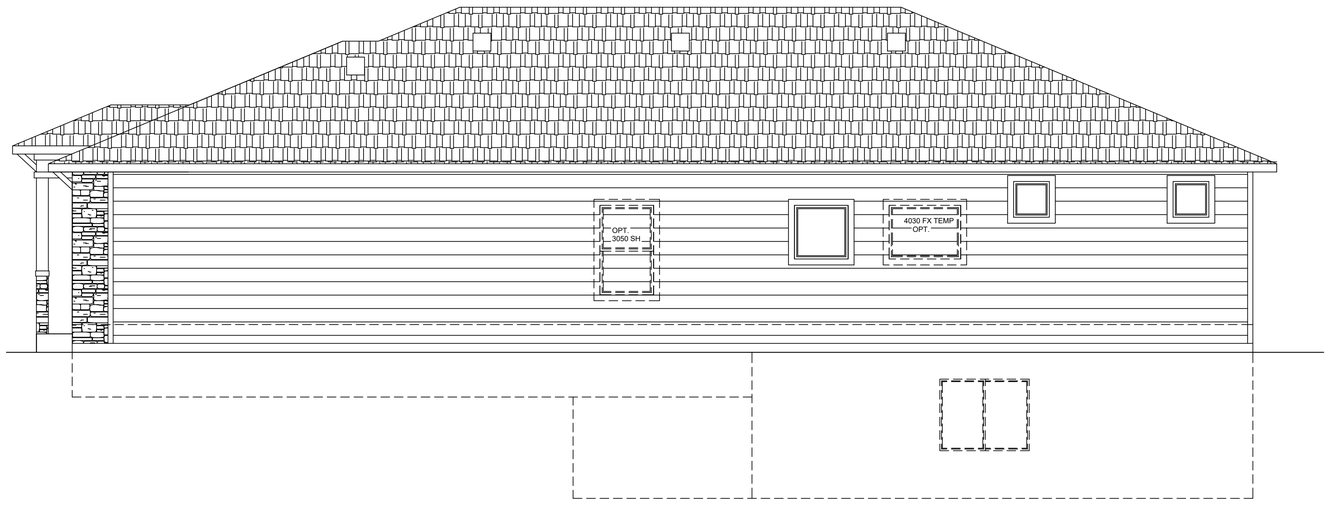

D1813.1 FRONT ELEVATION- MODERN PRAIRIE

1/4"=1'-0"



REAR ELEVATION

1/4"=1'-0"




GARAGE SIDE ELEVATION

1/4"=1'-0"

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6605 EASTCHASE DRIVE
SUITE 250
COLORADO SPRINGS, CO 80920
719-598-5192

SHEET NAME
ELEVATION- MODERN PRAIRIE

PROJECT NAME
MASTER PLAN D1813.1

STAMPS/ENDORSEMENTS

DRAWN BY:
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8/27/18

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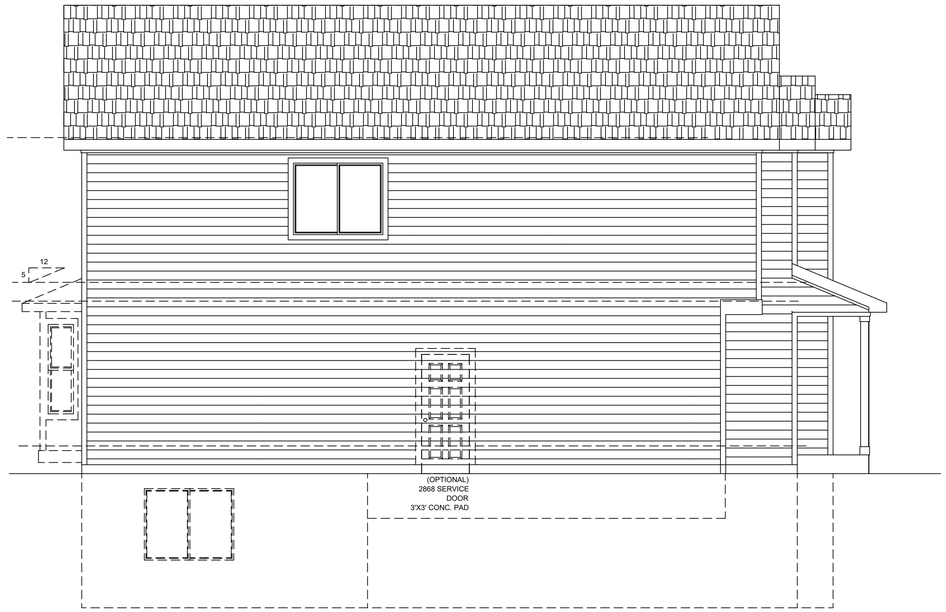
SUBMITTALS / REVISIONS

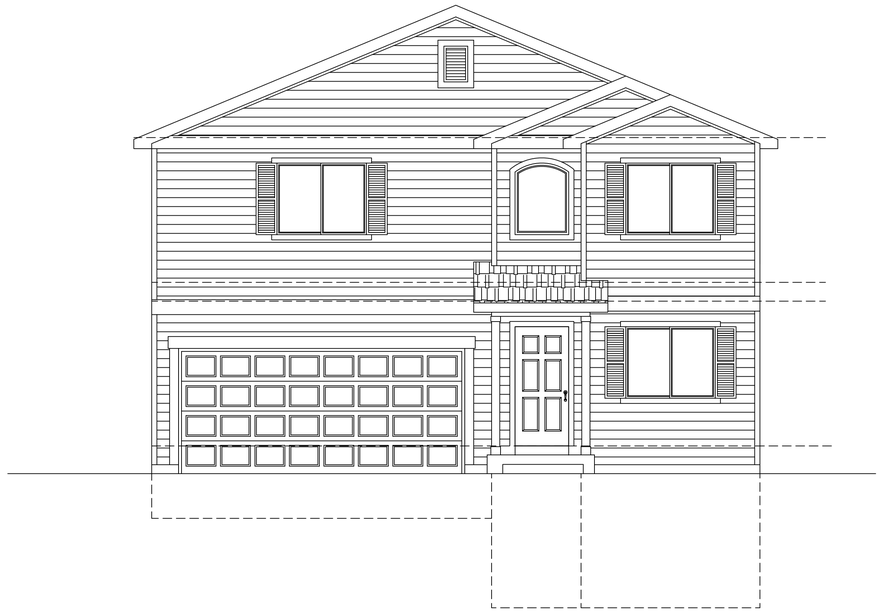
| BY | TYPE | DATE |
|---|---|---|
| | | |

ELEVATION MOD. PR.

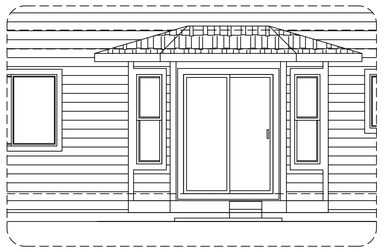
SHEET NUMBER
14



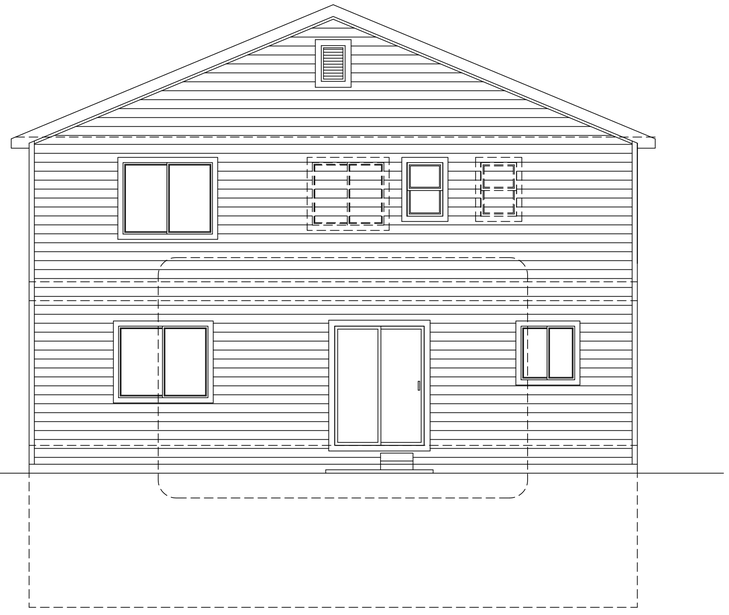

GARAGE SIDE ELEVATION "A"
1/4"=1'-0"



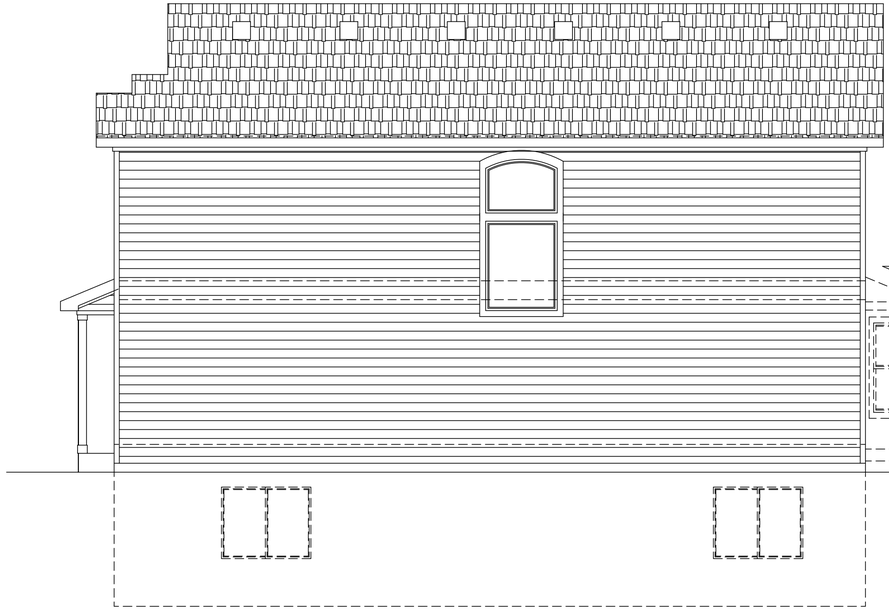
D2146.7 FRONT ELEVATION "A"
1/4"=1'-0"



OPT BAY AT DINING
1/4"=1'-0"



REAR ELEVATION "A"
1/4"=1'-0"




SIDE ELEVATION "A"
1/4"=1'-0"

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719-598-5192

SHEET NAME
ELEVATION- "A"

PROJECT NAME
MASTER PLAN D2146.7

STAMPS/ENDORSEMENTS

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|---|---|---|
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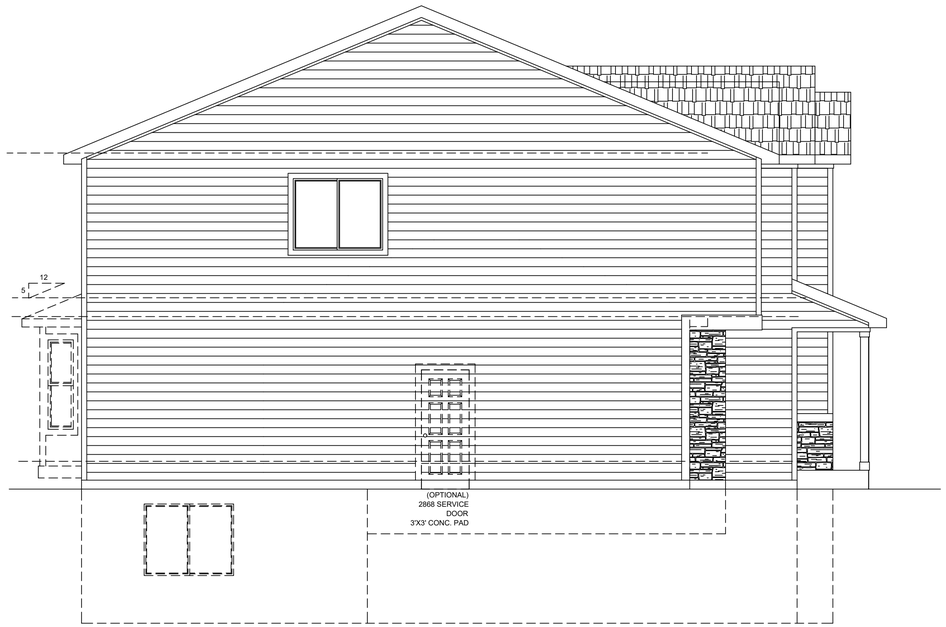
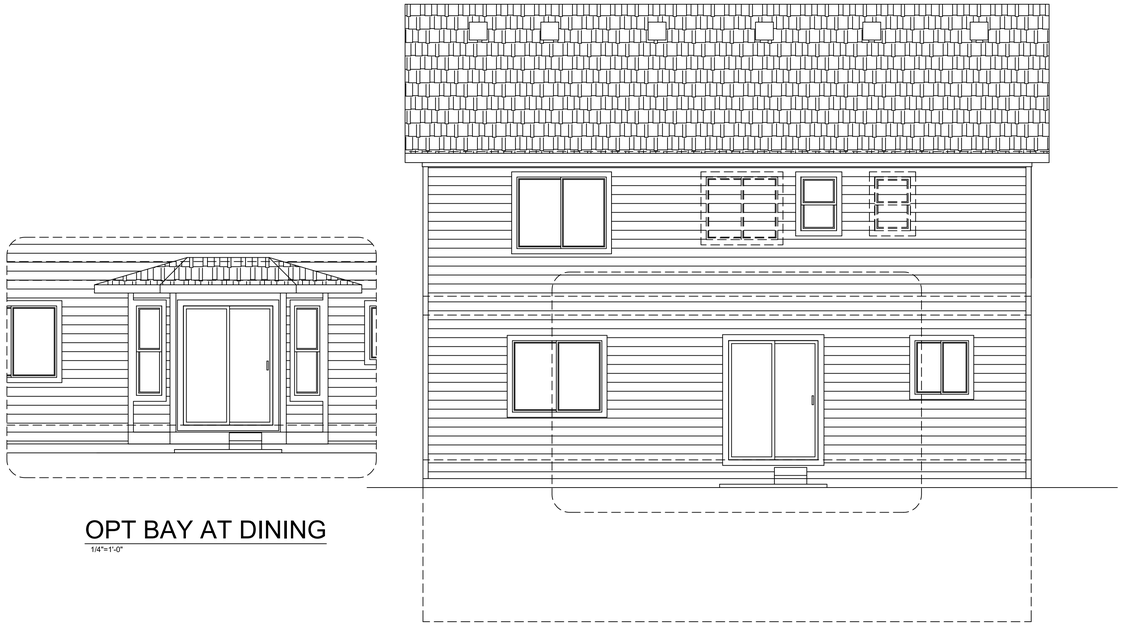
ELEVATION ELEV "A"

SHEET NUMBER
15



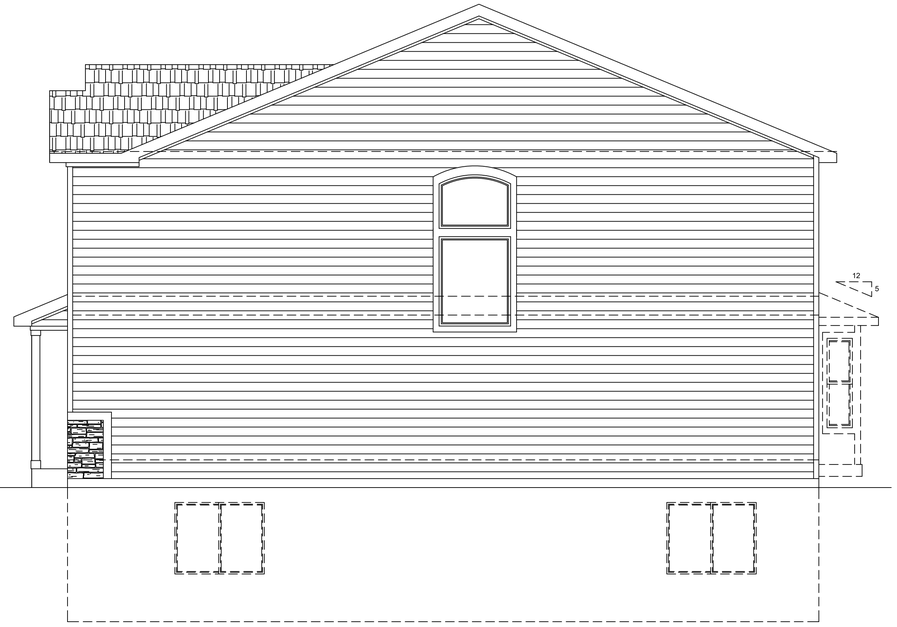

GARAGE SIDE ELEVATION "C"
1/4"=1'-0"

D2146.7 FRONT ELEVATION "C"
1/4"=1'-0"



OPT BAY AT DINING
1/4"=1'-0"

REAR ELEVATION "C"
1/4"=1'-0"




SIDE ELEVATION "C"
1/4"=1'-0"

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SHEET NAME
ELEVATION- "C"

PROJECT NAME
MASTER PLAN D2146.7

STAMPS/ENDORSEMENTS

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SUBMITTALS / REVISIONS

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SUBMITTALS / REVISIONS

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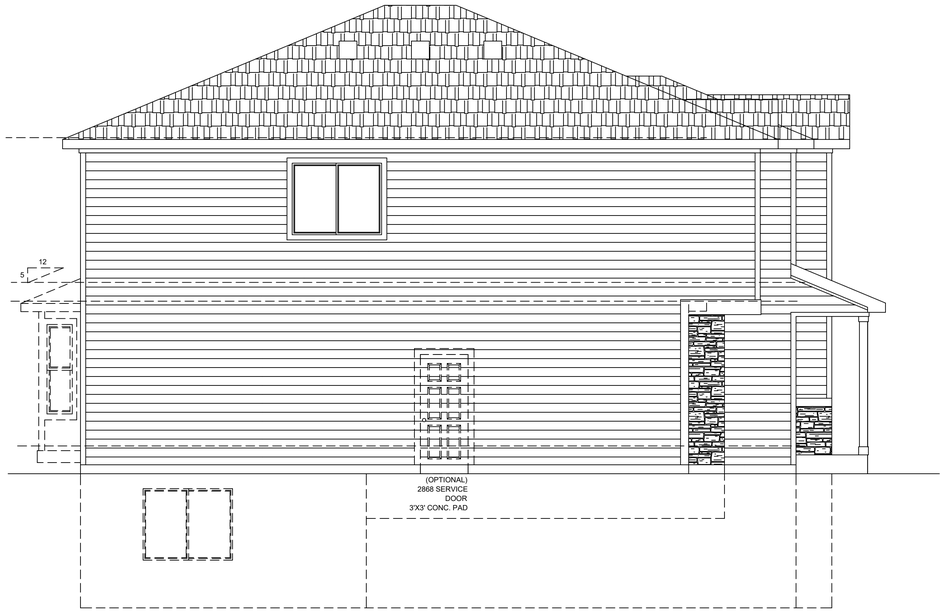
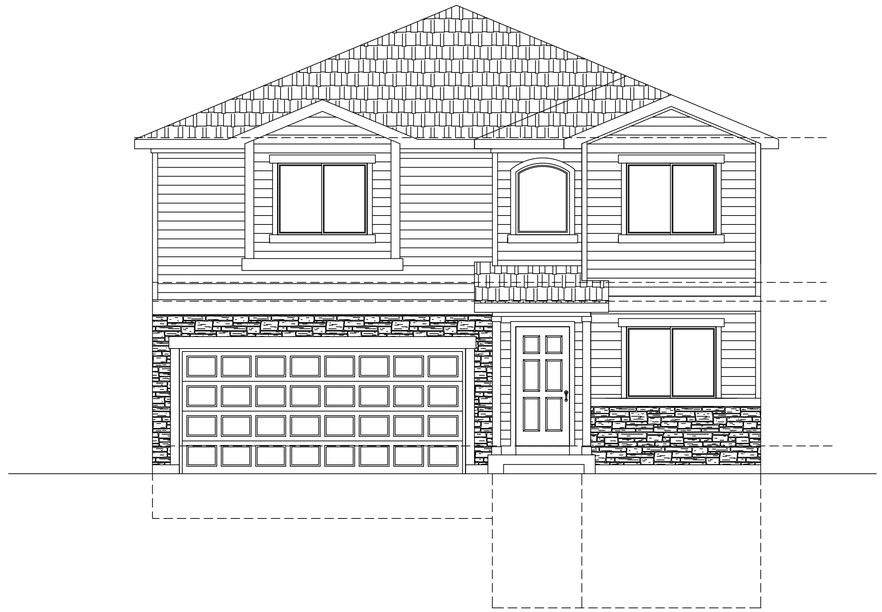
ELEVATION ELEV "C"

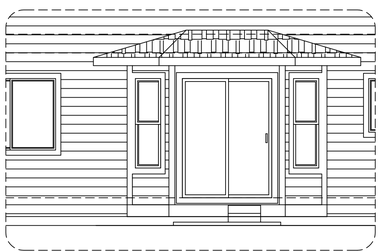
SHEET NUMBER
16



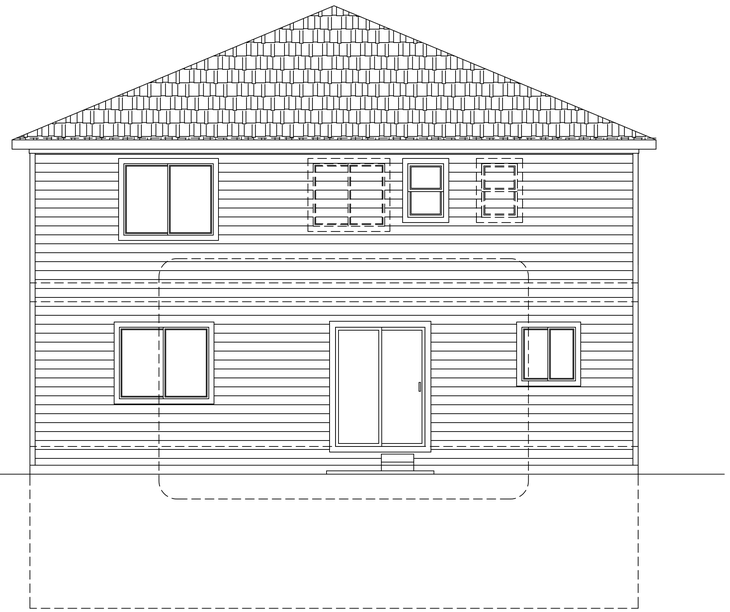

GARAGE SIDE ELEVATION "D"
1/4"=1'-0"



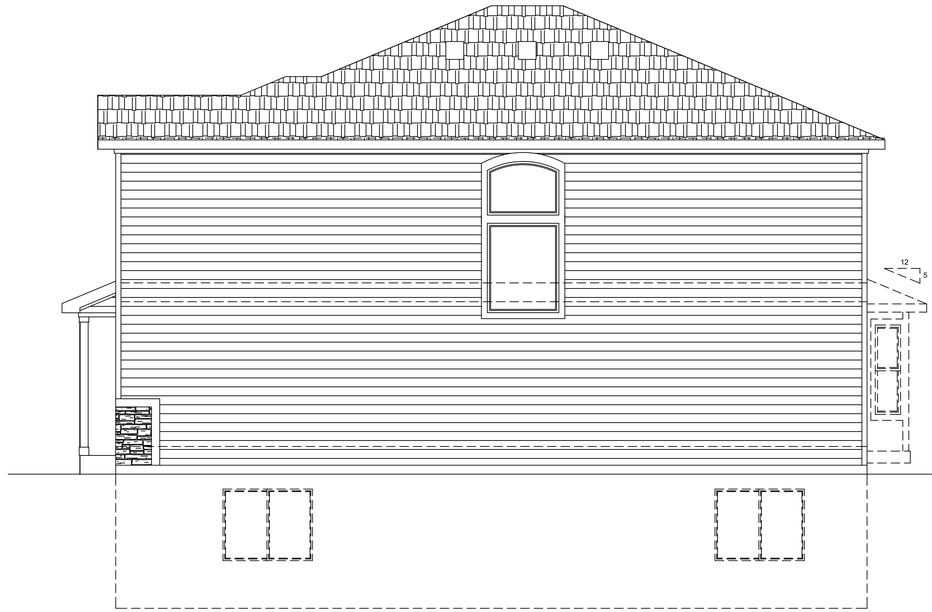
D2146.7 FRONT ELEVATION "D"
1/4"=1'-0"



OPT BAY AT DINING
1/4"=1'-0"



REAR ELEVATION "D"
1/4"=1'-0"




SIDE ELEVATION "D"
1/4"=1'-0"

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SHEET NAME
ELEVATION- "D"

PROJECT NAME
MASTER PLAN D2146.7

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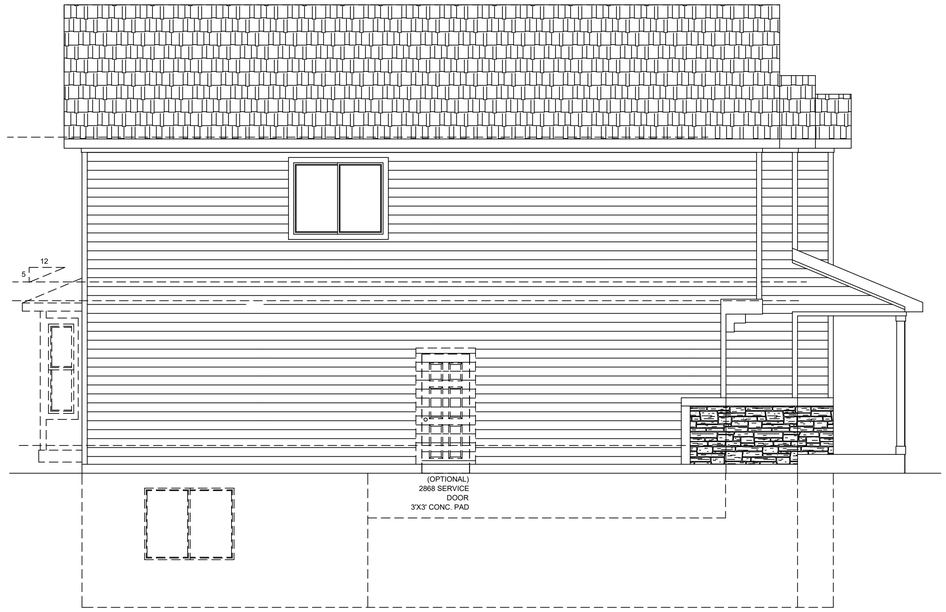
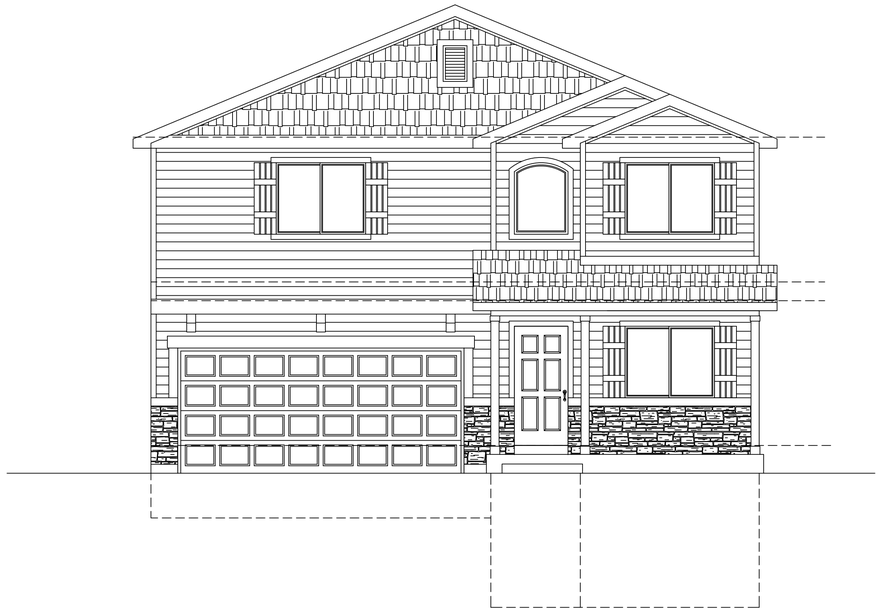
ELEVATION ELEV "D"

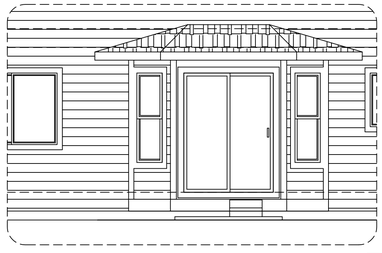
SHEET NUMBER
17



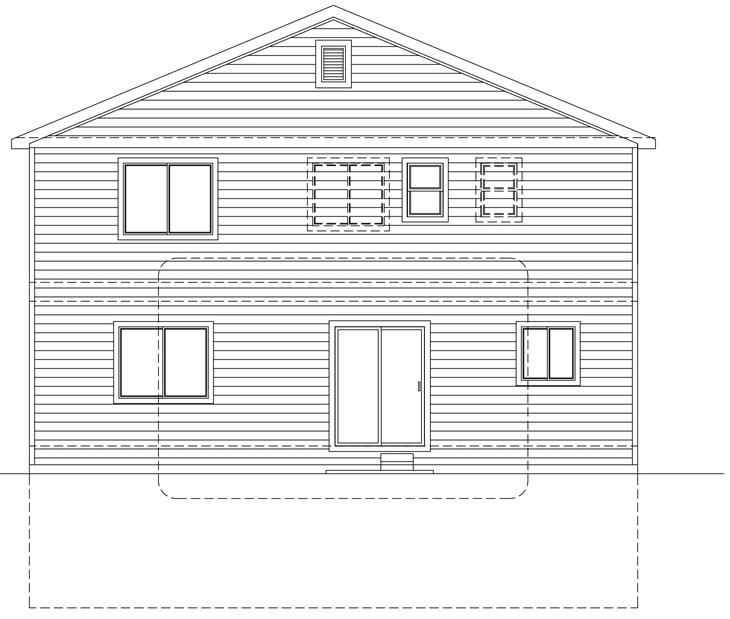

GARAGE SIDE ELEVATION "E"
1/4"=1'-0"



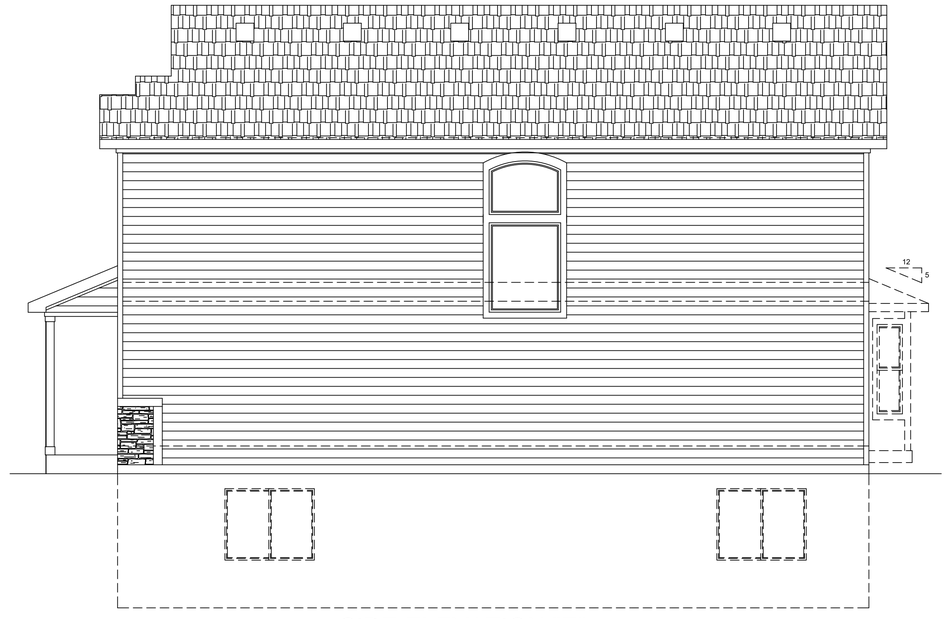
D2146.7 FRONT ELEVATION "E"
1/4"=1'-0"



OPT BAY AT DINING
1/4"=1'-0"



REAR ELEVATION "E"
1/4"=1'-0"




SIDE ELEVATION "E"
1/4"=1'-0"

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SHEET NAME
ELEVATION- "E"

PROJECT NAME
MASTER PLAN D2146.7

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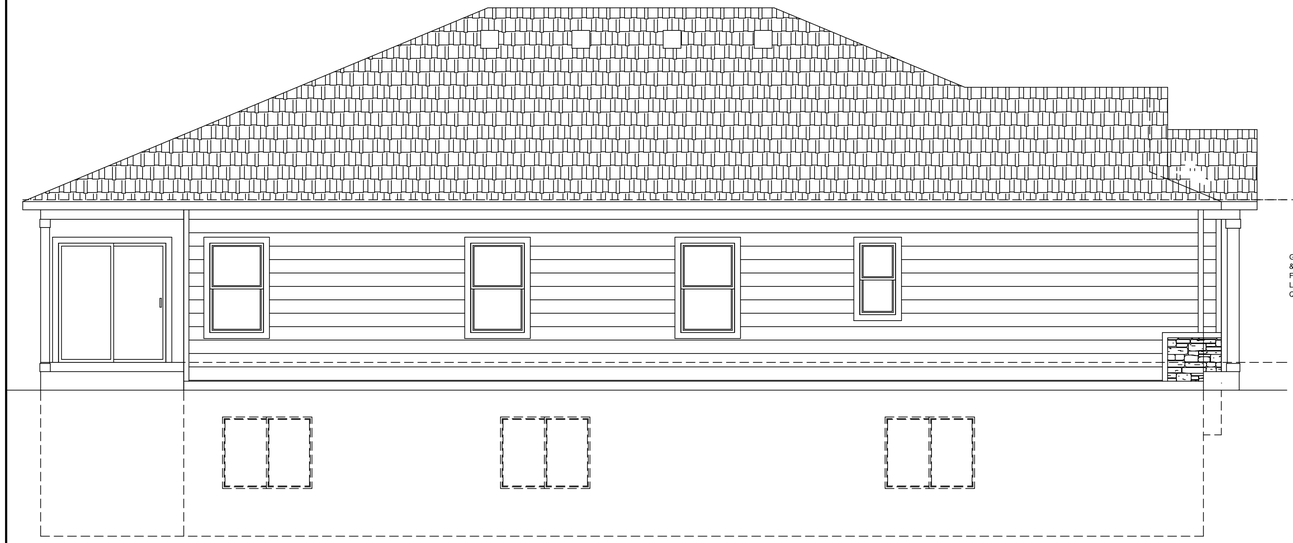
ELEVATION ELEV "E"

SHEET NUMBER
18

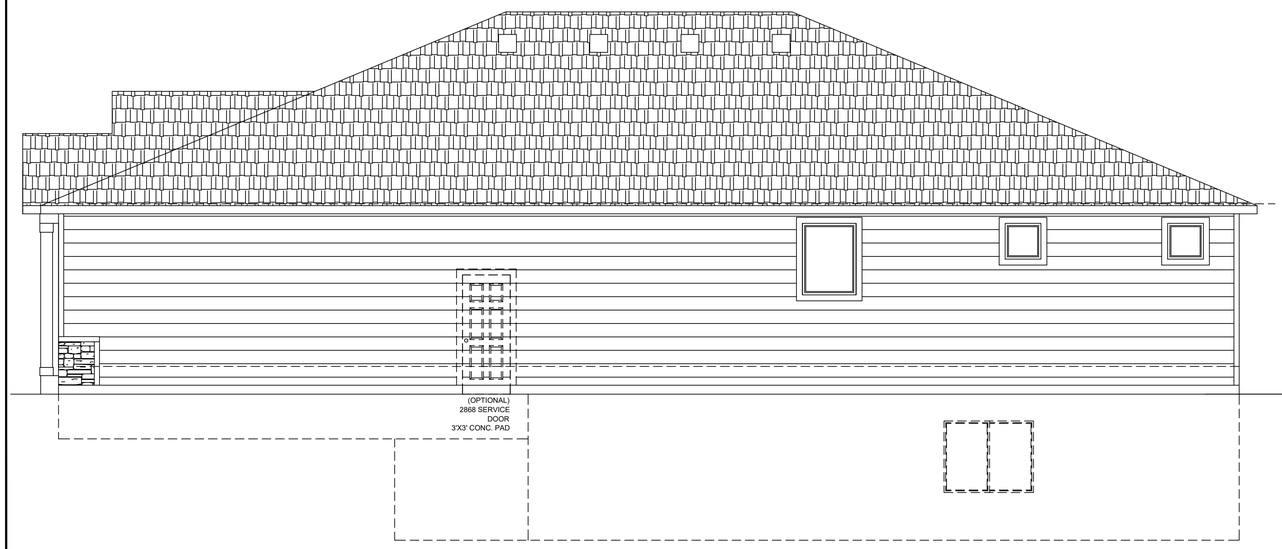


D2357.1 SIDE ELEVATION- TRADITIONAL

1/4"=1'-0"

D2357.1 FRONT ELEVATION-TRADITIONAL

1/4"=1'-0"




GARAGE SIDE ELEVATION- TRADITIONAL

1/4"=1'-0"

REAR ELEVATION- TRADITIONAL

1/4"=1'-0"

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SHEET NAME
ELEVATION- TRADITIONAL

PROJECT NAME
MASTER PLAN D2357.1

STAMPS/ENDORSEMENTS

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| BY | TYPE | DATE |
|---|---|---|
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SUBMITTALS / REVISIONS

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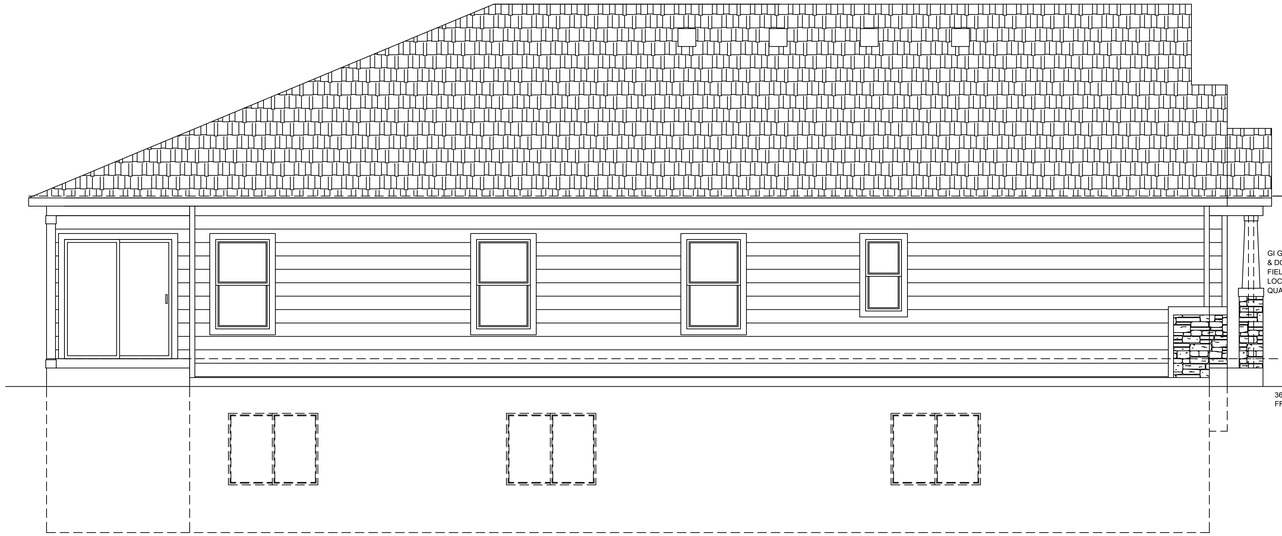
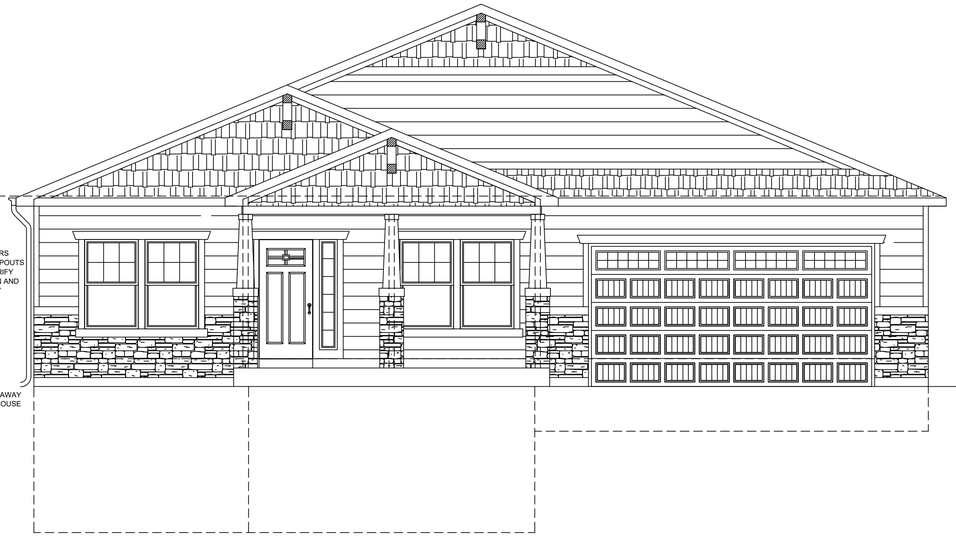
ELEVATION TRAD.

SHEET NUMBER
19



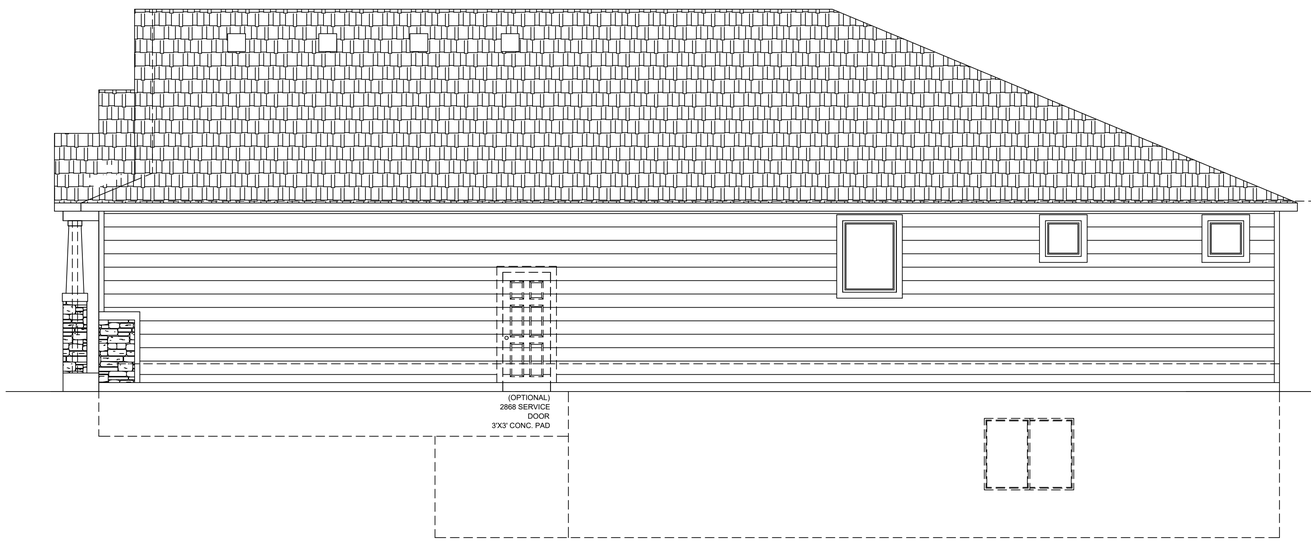

D2357.1 SIDE ELEVATION- CRAFTSMAN

1/4"=1'-0"



D2357.1 FRONT ELEVATION-CRAFTSMAN

1/4"=1'-0"




GARAGE SIDE ELEVATION- CRAFTSMAN

1/4"=1'-0"

REAR ELEVATION- CRAFTSMAN

1/4"=1'-0"

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SHEET NAME
ELEVATION- CRAFTSMAN

PROJECT NAME
MASTER PLAN D2357.1

STAMPS/ENDORSEMENTS

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SUBMITTALS / REVISIONS

| BY | TYPE | DATE |
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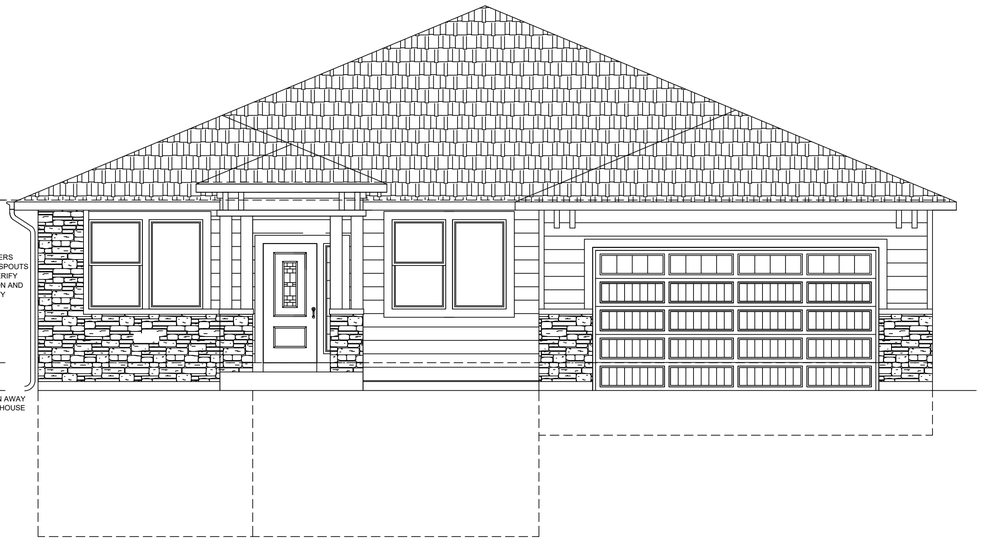
| | | |

ELEVATION CRAFT.

SHEET NUMBER
20

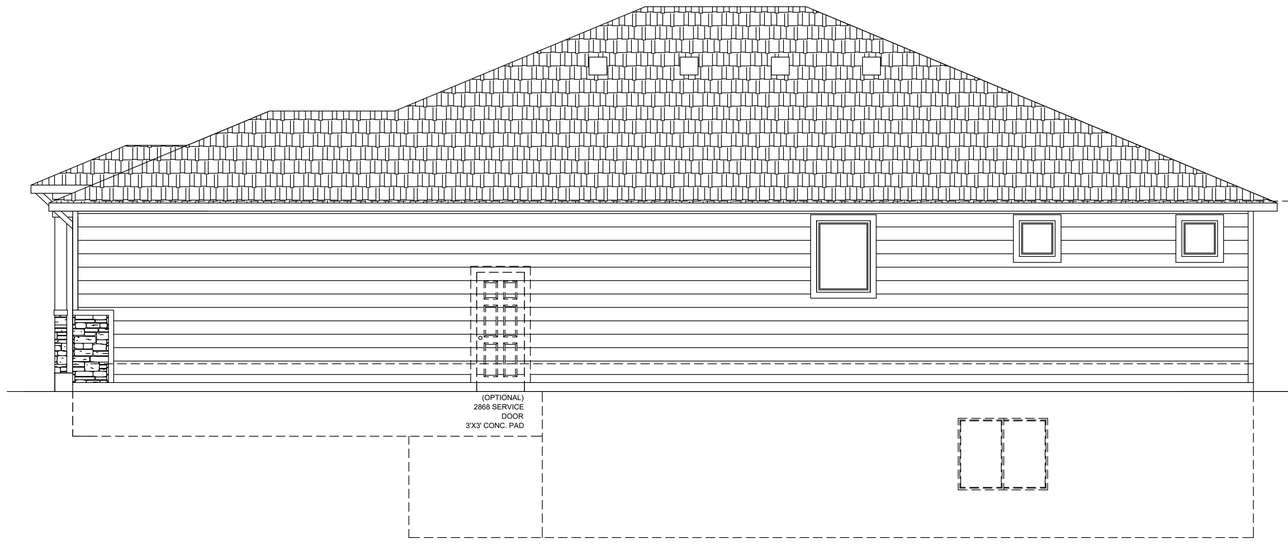
D2357.1 SIDE ELEVATION- MODERN PRAIRIE

1/4"=1'-0"



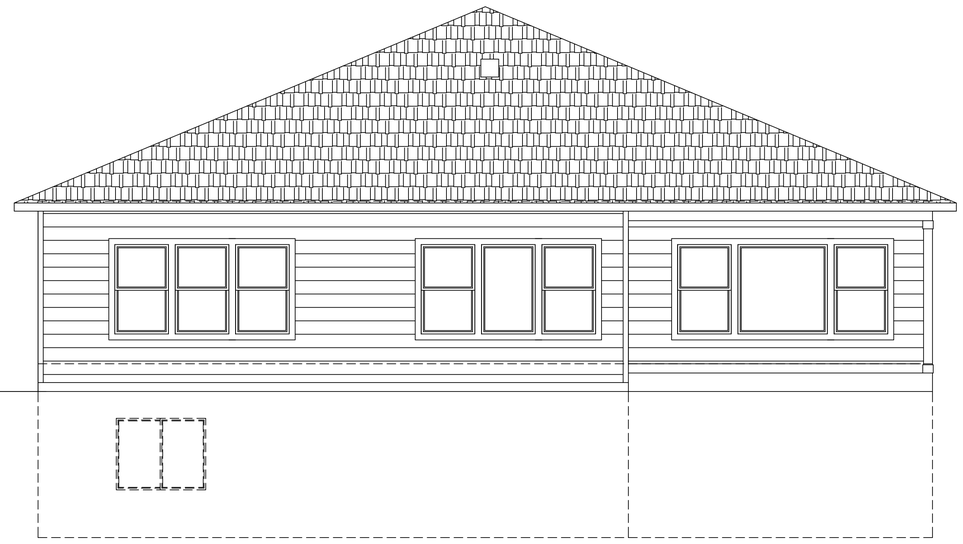
D2357.1 FRONT ELEVATION-MODERN PRAIRIE

1/4"=1'-0"




GARAGE SIDE ELEVATION- MODERN PRAIRIE

1/4"=1'-0"



REAR ELEVATION- MODERN PRAIRIE

1/4"=1'-0"

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SHEET NAME
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PROJECT NAME
MASTER PLAN D2357.1

STAMPS/ENDORSEMENTS

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SUBMITTALS / REVISIONS

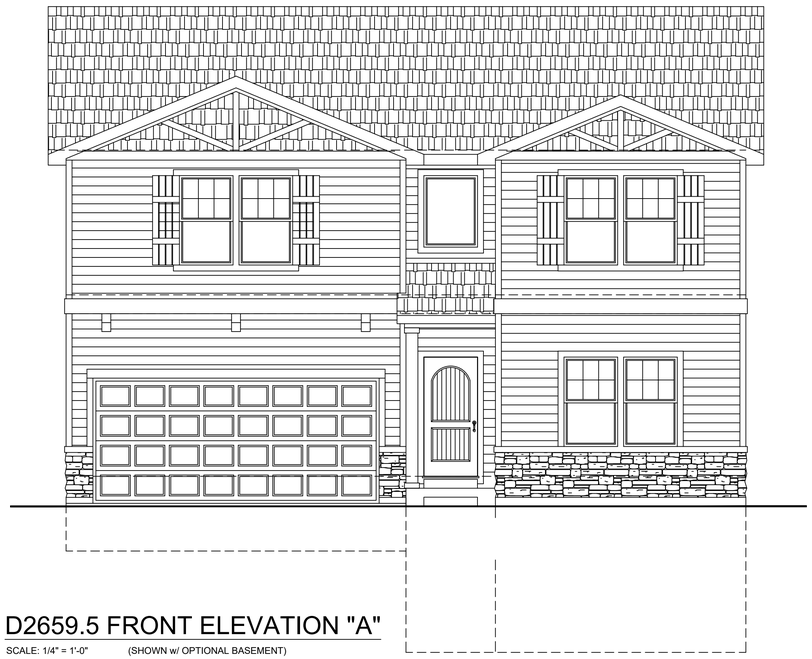
| BY | TYPE | DATE |
|---|---|---|
| | | |

ELEVATION MOD. PR.

SHEET NUMBER
21

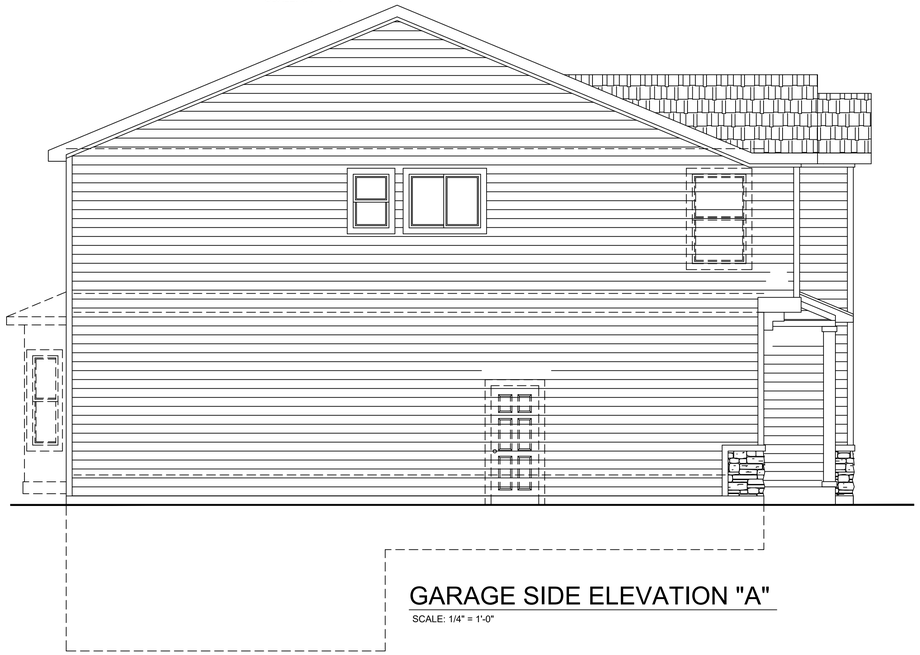
REAR ELEVATION "A"

SCALE: 1/4" = 1'-0"



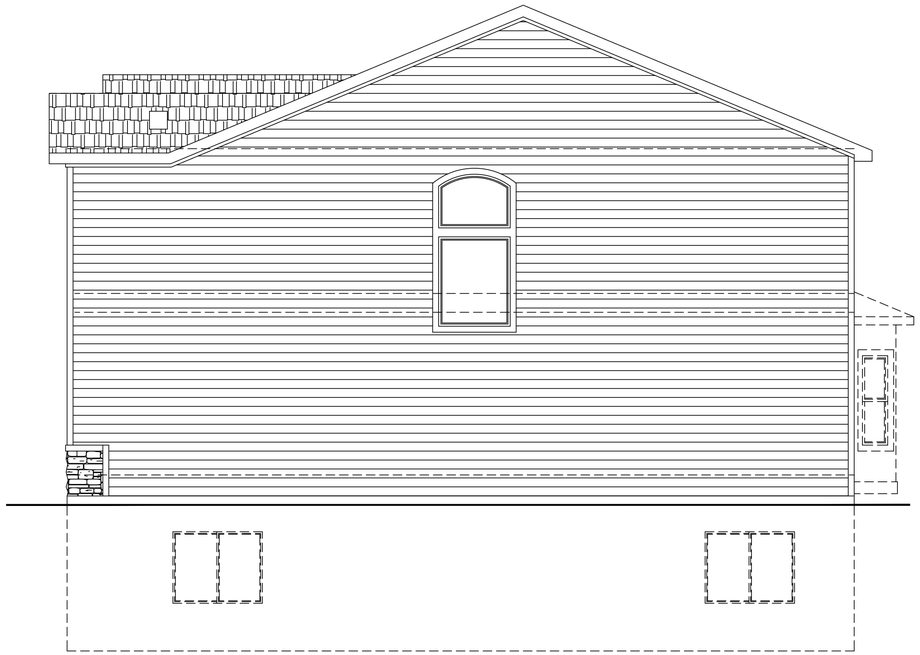
D2659.5 FRONT ELEVATION "A"

SCALE: 1/4" = 1'-0" (SHOWN w/ OPTIONAL BASEMENT)



GARAGE SIDE ELEVATION "A"

SCALE: 1/4" = 1'-0"



RIGHT ELEVATION "A"

SCALE: 1/4" = 1'-0"

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SHEET NAME
ELEVATION- "A"

PROJECT NAME
MASTER PLAN D2659.5

STAMPS/ENDORSEMENTS

DRAWN BY:
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DATE:
8/27/18

SUBMITTALS / REVISIONS

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SUBMITTALS / REVISIONS

| BY | TYPE | DATE |
|---|---|---|
| | | |

ELEVATION "A"

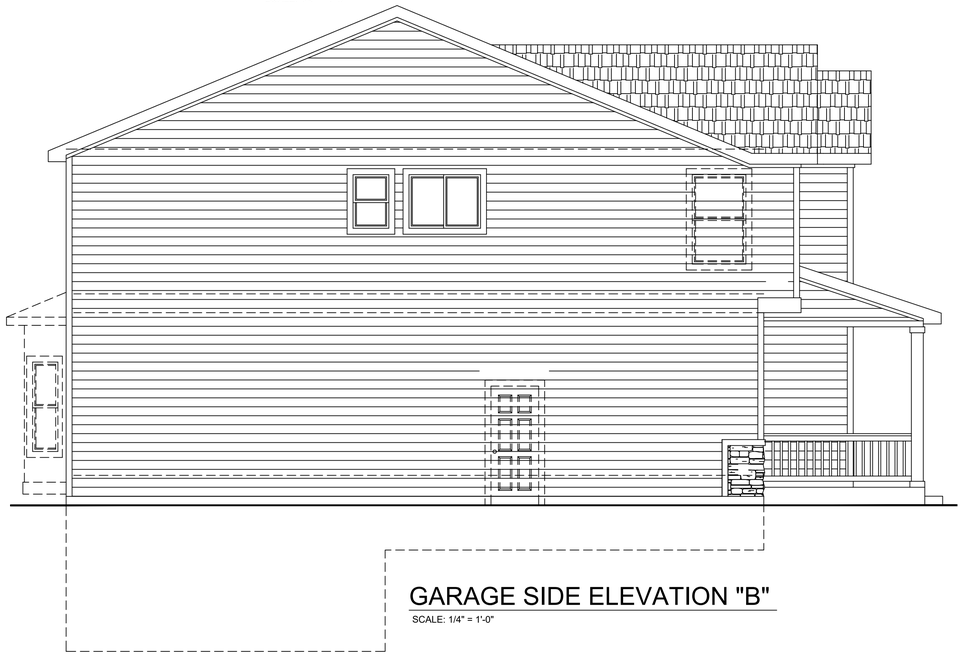
SHEET NUMBER
22

REAR ELEVATION "B"

SCALE: 1/4" = 1'-0"

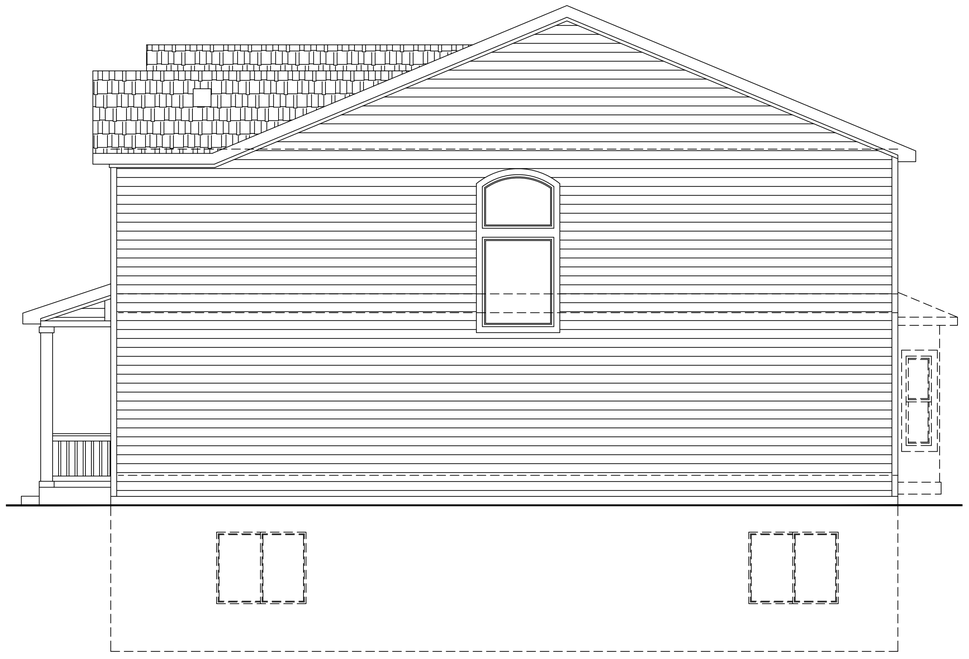
D2659.5 FRONT ELEVATION "B"

SCALE: 1/4" = 1'-0" (SHOWN w/ OPTIONAL BASEMENT)



GARAGE SIDE ELEVATION "B"

SCALE: 1/4" = 1'-0"



RIGHT ELEVATION "B"

SCALE: 1/4" = 1'-0"

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CHALLENGER BUILDING, LLC.
8605 EXPLORER DRIVE
SUITE 250
COLORADO SPRINGS, CO 80920
719-598-5192

SHEET NAME
ELEVATION- "B"

PROJECT NAME
MASTER PLAN D2659.5

STAMPS/ENDORSEMENTS

DRAWN BY:
AL

DATE:
8/27/18

SUBMITTALS / REVISIONS

| BY | TYPE | DATE |
|---|---|---|
| | | |

SUBMITTALS / REVISIONS

| BY | TYPE | DATE |
|---|---|---|
| | | |

ELEVATION "B"

SHEET NUMBER
23

REAR ELEVATION "E"

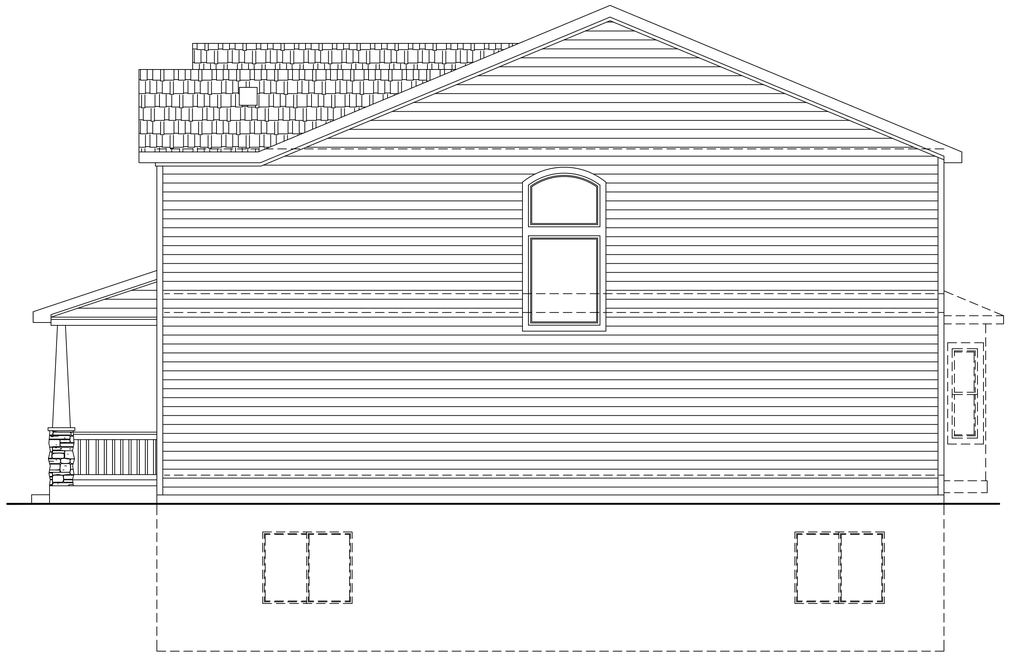
SCALE: 1/4" = 1'-0"

D2659.5 FRONT ELEVATION "E"

SCALE: 1/4" = 1'-0" (SHOWN w/ OPTIONAL BASEMENT)

GARAGE SIDE ELEVATION "E"

SCALE: 1/4" = 1'-0"



RIGHT ELEVATION "E"

SCALE: 1/4" = 1'-0"

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SHEET NAME: ELEVATION- "E"

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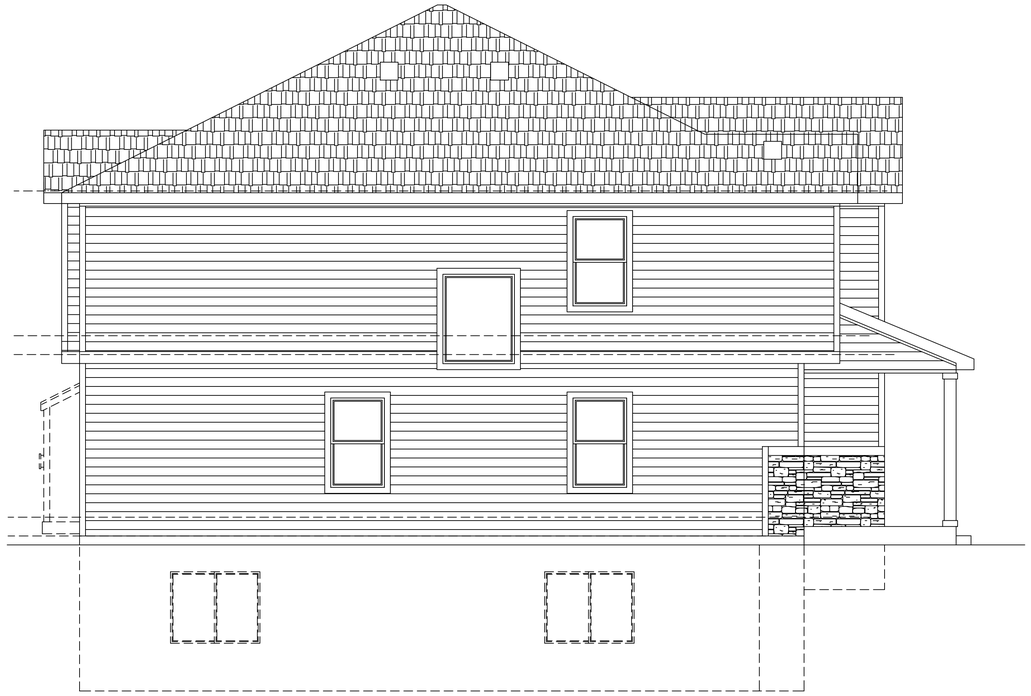
ELEVATION "E"

SHEET NUMBER

24



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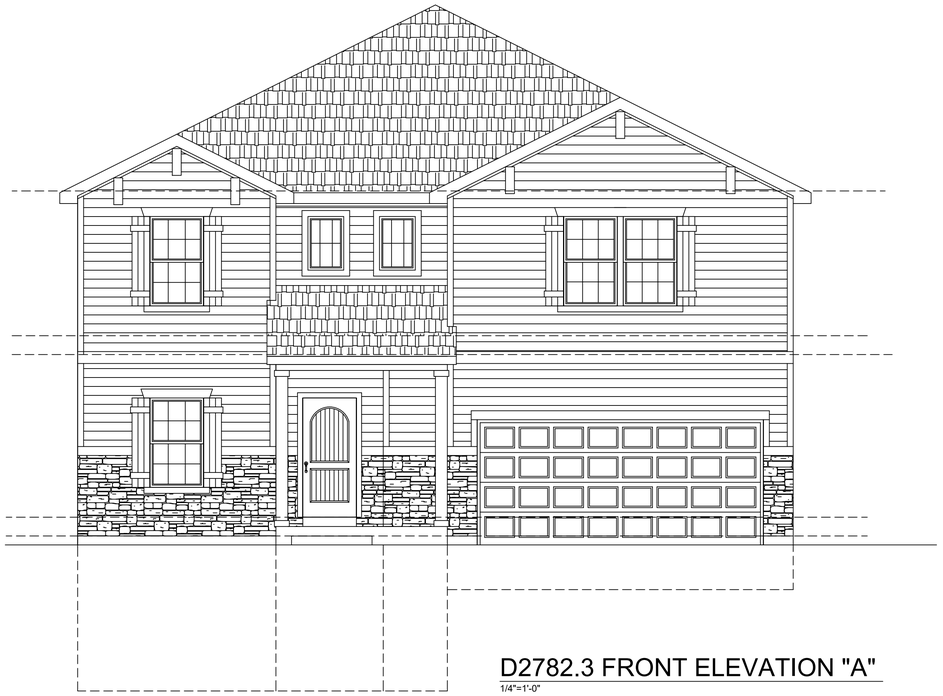
1/4"=1'-0"



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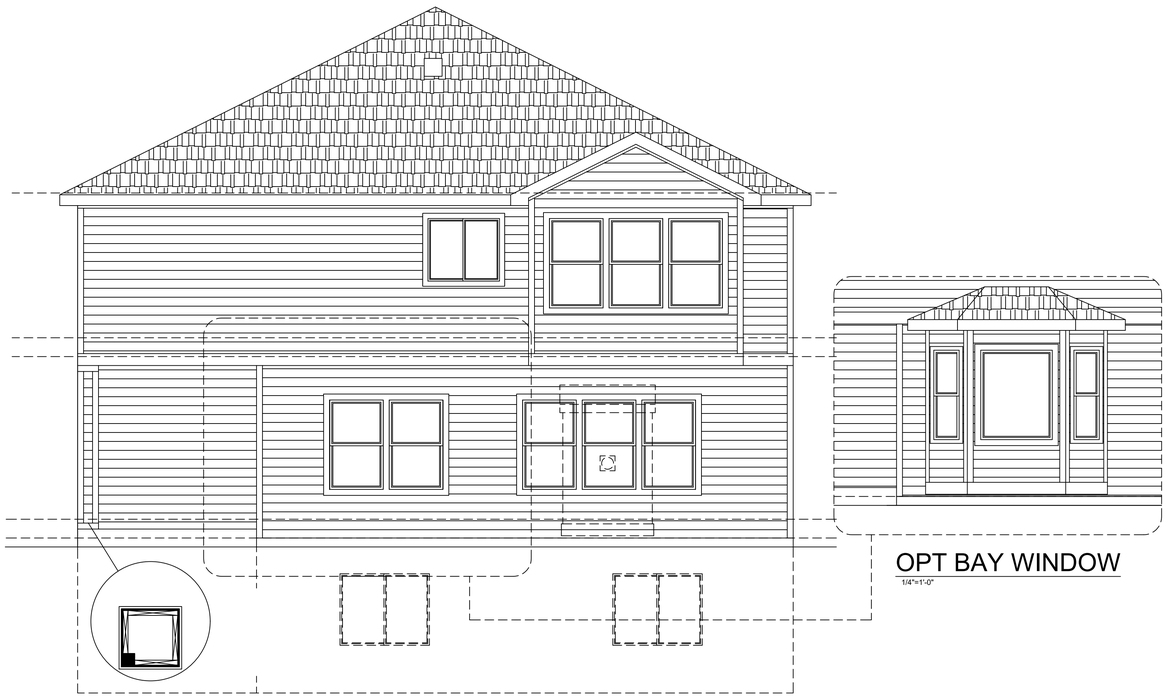
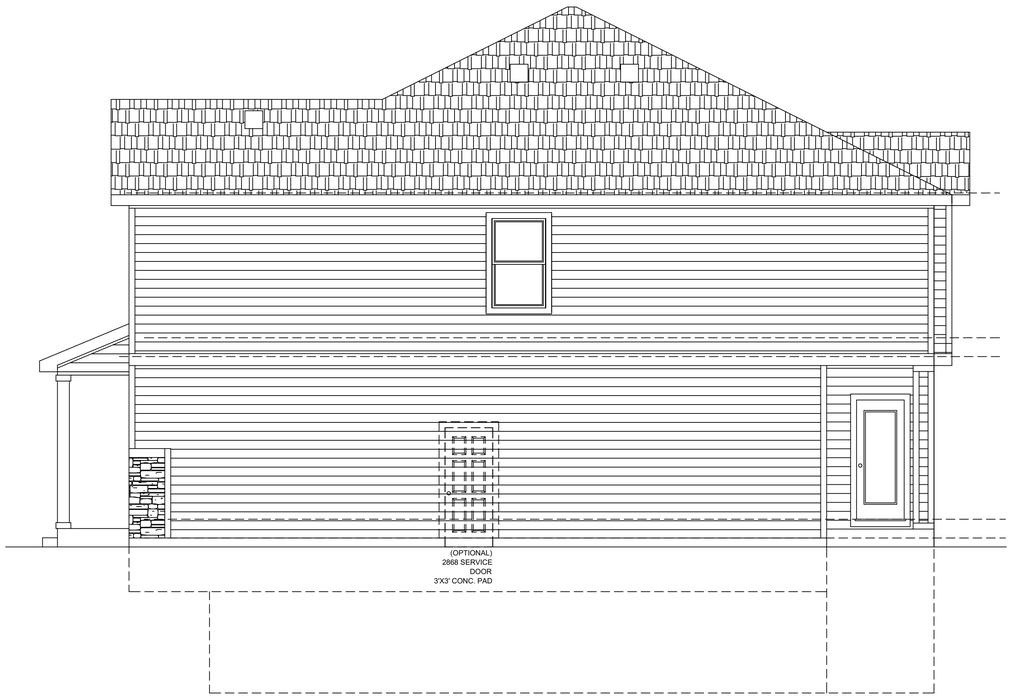


REAR ELEVATION "A"
1/4"=1'-0"



OPT BAY WINDOW
1/4"=1'-0"




GARAGE SIDE ELEVATION "A"
1/4"=1'-0"

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SHEET NAME
ELEVATION- "A"

PROJECT NAME
MASTER PLAN D2782.3

STAMPS/ENDORSEMENTS

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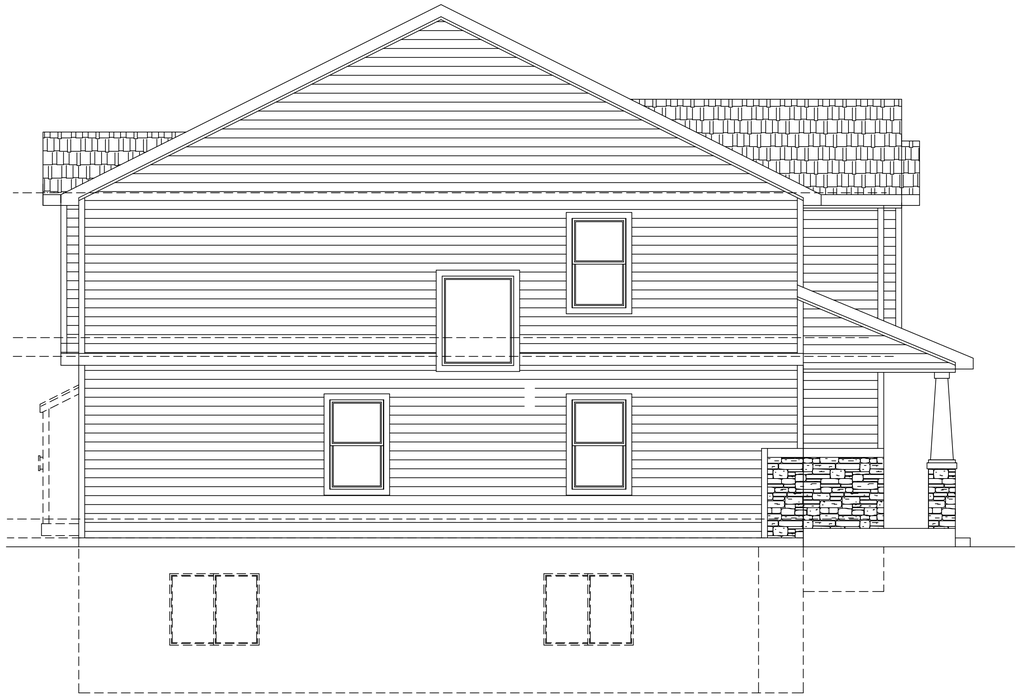
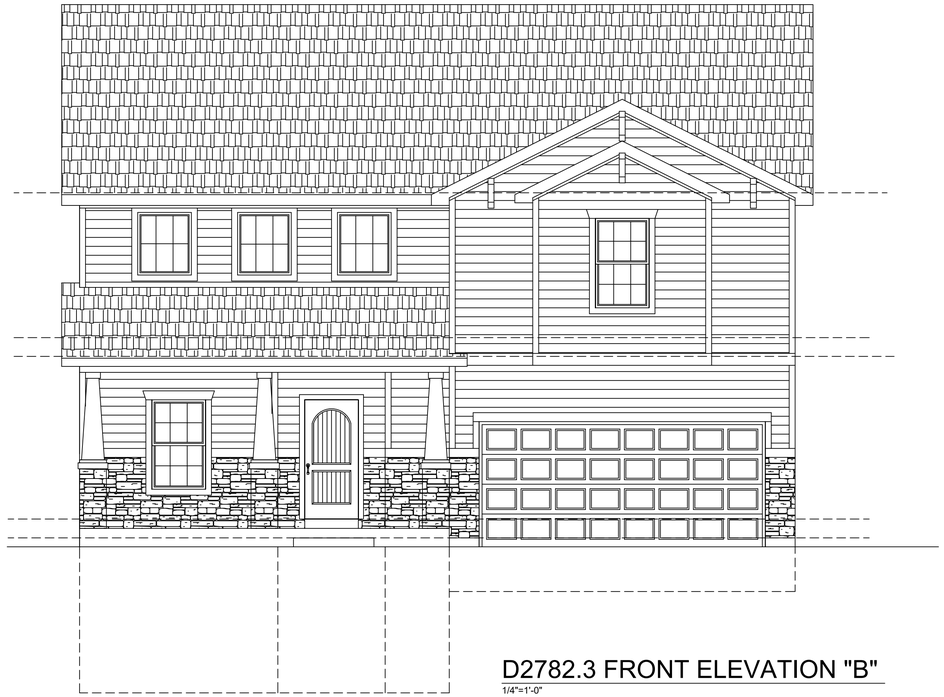
ELEVATION "A"

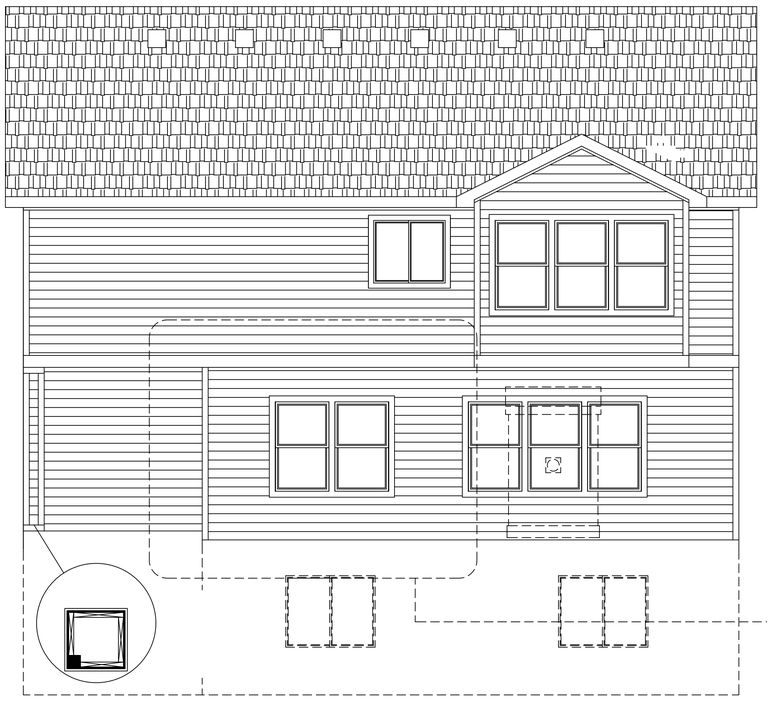
SHEET NUMBER
25



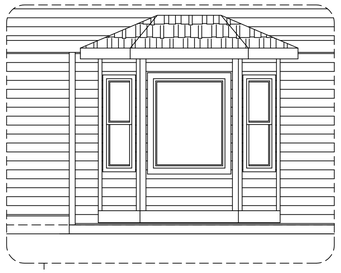
SIDE ELEVATION "B"
1/4"=1'-0"



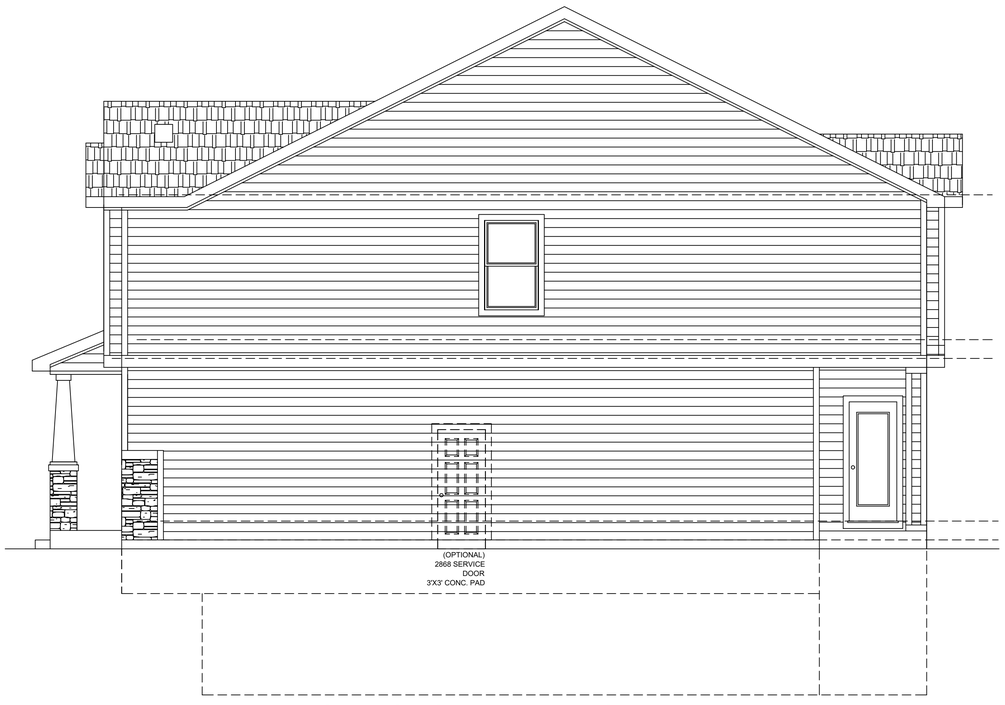
D2782.3 FRONT ELEVATION "B"
1/4"=1'-0"



REAR ELEVATION "B"
1/4"=1'-0"



OPT BAY WINDOW
1/4"=1'-0"




GARAGE SIDE ELEVATION "B"
1/4"=1'-0"

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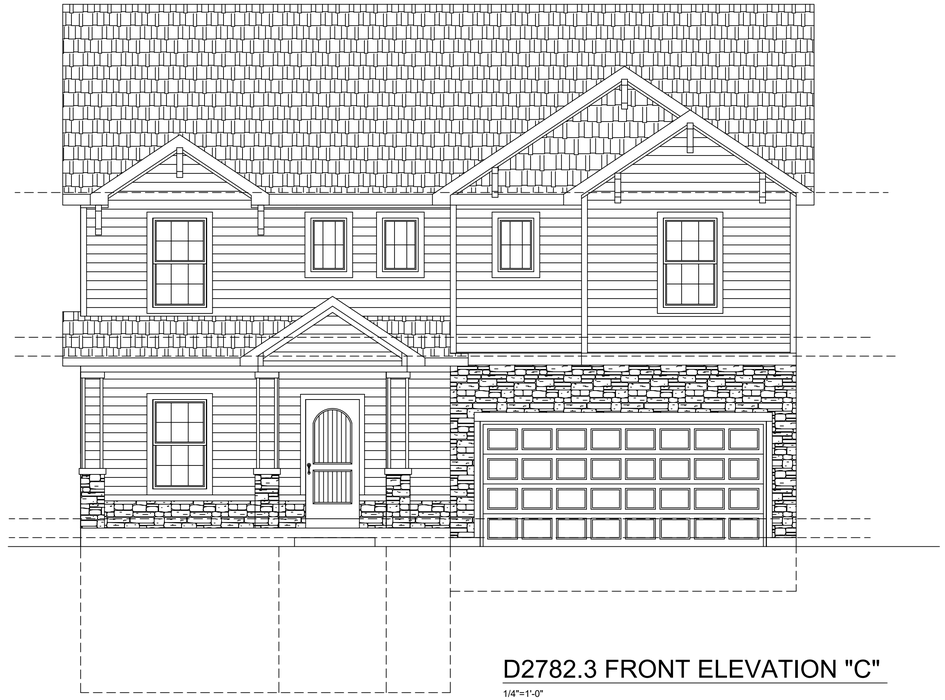
| BY | TYPE | DATE |
|---|---|---|
| | | |

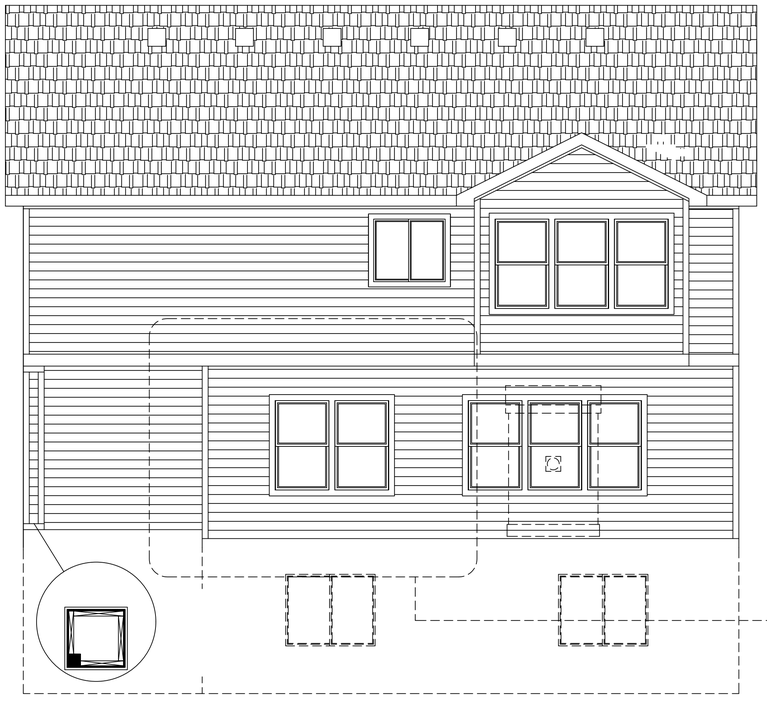
ELEVATION "B"

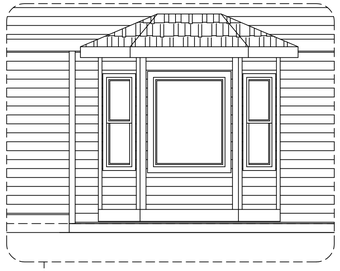
SHEET NUMBER
26

SIDE ELEVATION "C"
1/4"=1'-0"



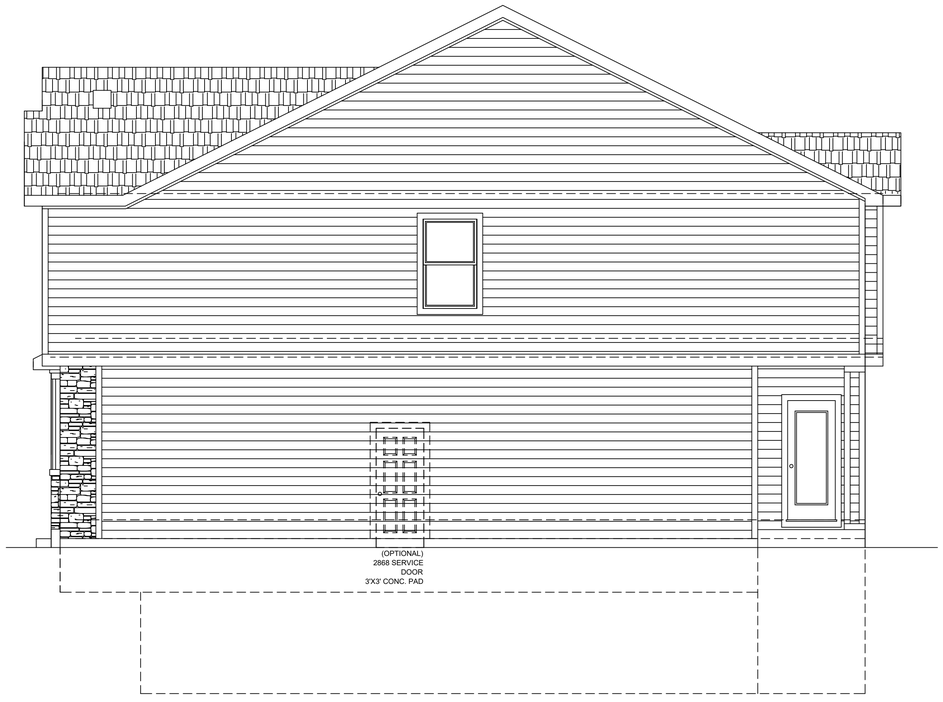
D2782.3 FRONT ELEVATION "C"
1/4"=1'-0"





OPT BAY WINDOW
1/4"=1'-0"

REAR ELEVATION "C"
1/4"=1'-0"




GARAGE SIDE ELEVATION "C"
1/4"=1'-0"

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719-598-5192

SHEET NAME
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PROJECT NAME
MASTER PLAN D2782.3

STAMPS/ENDORSEMENTS

DRAWN BY:
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DATE:
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SUBMITTALS / REVISIONS

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| BY | TYPE | DATE |
|---|---|---|
| | | |

ELEVATION "C"

SHEET NUMBER
27

# COYOTE CREEK FILING NO. 4

## COYOTE CREEK PA-4 LOCATED IN
## NE QUARTER OF SECTION 5, TOWNSHIP 1 NORTH, RANGE 66 WEST OF 6TH P.M., FORT LUPTON, COUNTY OF WELD, STATE OF COLORADO

# CONSTRUCTION PLANS

## KEY CONTACTS


OWNER:

LUPTON LAND, LLC (303) 587-1966
10221 PRESTWICK TRAIL
LONE TREE, CO 80124
ATTN: BOB QUINETTE

PLANNER/CIVIL ENGINEER/LANDSCAPE ARCHITECT

JR ENGINEERING (970) 305-6754
2900 SOUTH COLLEGE AVENUE, SUITE 3D
FORT COLLINS, CO 80525
ATTN: KEN MERRITT

CITY

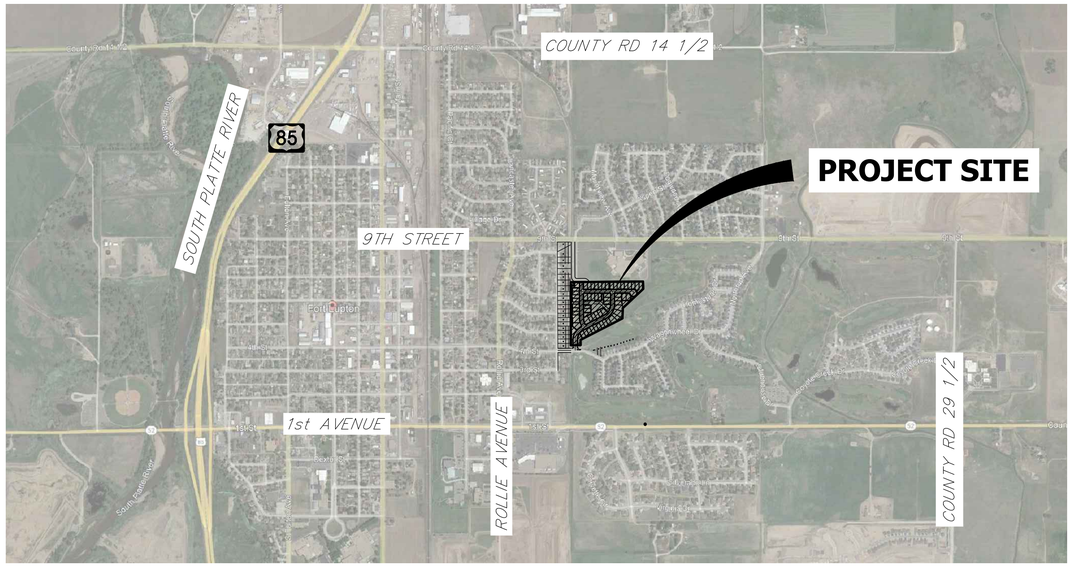
CITY OF FORT LUPTON, ENGINEERING (720) 466-6106
130 SOUTH McKINLEY AVENUE
FORT LUPTON, CO 80621
ATTN: TODD HODGES


## BENCHMARK:

WELD COUNTY BENCHMARK 4907, 3-3/4" PIPE CAP ON PIPE APPROXIMATELY 90 FEET WEST OF THE WESTERLY MOST RAILROAD TRACK AND 26 FEET SOUTH OF THE CENTERLINE OF 9TH STREET, ELEVATION=4908.22 (NAVD88)

## BASIS OF BEARING:

THE WEST LINE OF THE NORTHEAST QUARTER OF SECTION 5, TOWNSHIP 1 NORTH, RANGE 66 WEST OF THE 6TH PRINCIPAL MERIDIAN, BEING MONUMENTED AT THE NORTH END BY A 3-1/4" ALUMINUM CAP STAMPED "1/4 2003 PLS 14823" IN A RANGE BOX AND AT THE SOUTH END BY A #6 REBAR WITH 3-1/4" ALUMINUM CAP STAMP ILLEGIBLE OFF TO THE SIDE IN A RANGE BOX, BEARING N00°16'07"W AS REFERENCED TO COLORADO STATE PLANE NORTH ZONE.




PROJECT LOCATION MAP
SCALE: 1" = 1000'

## SHEET INDEX


| | | |
|---|---|---|
| 1 | – | COVER SHEET |
| 2 | – | GENERAL NOTES |
| 3 | – | OVERALL LEGEND |
| 4 | – | PUD FINAL PLAT |
| 5 | – | FINAL SITE PLAN |
| 6 | – | FINAL GRADING & EROSION CONTROL PLAN |
| 7-9 | – | FINAL STREET PLAN AND PROFILE |
| 10 | – | FINAL UTILITY PLAN |
| 11-13 | – | WATER PLAN & PROFILE |
| 14-16 | – | SANITARY SEWER PLAN & PROFILE |
| 17 | – | SERVICE PLAN |
| 18 | – | FINAL DRAINAGE PLAN |
| 19-21 | – | STORM SEWER PLAN & PROFILE |
| 22 | – | SIGNAGE PLAN |
| 23-24 | – | LANDSCAPE PLAN |
| 25-29 | – | DETAILS |
| 30-46 | – | PRODUCT ELEVATIONS & PLANS |


## LAND SUMMARY CHART

EXISTING ZONING – PUD MULTI-FAMILY:193 DWELLING UNITS, 14.9 DU'S/AC

PROPOSED ZONING – PUD SINGLE FAMILY DETACHED RESIDENTIAL

TOTAL SITE AREA – 13.351AC

NUMBER OF LOTS – 59 LOTS

GROSS DENSITY – 4.42 DU'S/AC

MINIMUM LOT SIZE – 5,206 SF

MAXIMUM LOT SIZE – 9,928 SF

AVERAGE LOT SIZE – 5,921 SF

| | | | |
|---|---|---|---|
| SINGLE FAMILY LOT AREA | 349,334SF | 8.0196AC | 60.0% OF SITE AREA |
| OPEN SPACE (TRACTS A-E) | 64,155SF | 1.4728AC | 11.0% OF SITE AREA |
| PARK SPACE (TRACT F) PUBLIC LAND DEDICATION | 44,213SF | 1.015AC | 7.70% OF SITE AREA |
| PUBLIC ROW | 123,866SF | 2.8436AC | 21.3% OF SITE AREA |
| TOTAL | 581,568SF | 13.351AC | 100% OF SITE AREA |

## SETBACK REQUIREMENTS

| | |
|---|---|
| FRONT SETBACK | 20' HOUSE / GARAGE |
| REAR YARD SETBACK | 20' |
| SIDE ACCESS SETBACK | 5' |
| CORNER SIDE YARD SETBACK AT ROW | 15' |

## PLAT NOTES

PRIOR TO FURTHER DEVELOPMENT OF COMMERCIAL BLOCKS/LOTS OR DEVELOPMENT OF RESIDENTIAL BLOCKS, A PRE-APPLICATION MEETING WILL BE REQUIRED TO DETERMINE THE APPROPRIATE LAND USE PROCESS. ANY FURTHER DIVISION OF BLOCKS MAY REQUIRE PRELIMINARY PLAT AND FINAL PLAT PROCESSES.

## DESIGN STANDARDS

NO HOME MODEL ELEVATION SHALL BE REPEATED MORE THAN ONCE EVERY THIRD (3RD) LOTS ON THE SAME SIDE OF THE STREET (E.G. THE FIRST AND FOURTH LOTS IN A ROW MAY CONTAIN THE SAME MODEL ELEVATION, BUT THE SECOND AND THIRD LOT MUST CONTAIN TWO (2) DIFFERENT MODEL ELEVATIONS.

ALL STREET FACING GARAGE DOORS ON GARAGES ATTACHED TO PRINCIPAL DWELLING STRUCTURES SHALL HAVE THE ABILITY TO BE PROUD OF THE FRONT FACADE OF THE DWELLING PORTION OF THE STRUCTURE AND/OR FRONT PORCH.

GARAGE DOORS SHALL NOT COMPRISE MORE THAN FORTY-SEVEN (47) PERCENT OF THE FRONT FACADE OF THE PRINCIPAL DWELLING STRUCTURE FOR TWO-CAR GARAGES NOR MORE THAN FIFTY-FIVE (55) PERCENT FOR THREE-CAR GARAGES.

ALL HOMES WILL INCORPORATE A SINGLE EARTH-TONED ASPHALT SHINGLE COLOR THAT WILL HARMONIZE WITH ALL EXTERIOR COLOR PALETTES WITHIN THE SUBDIVISION.

## FENCING STANDARDS

FENCES SHALL BE CONSTRUCTED PER THE FORT LUPTON MUNICIPAL CODE, EXCEPT THAT CHAIN LINK/WOVEN WIRE FENCES ARE NOT AN ALLOWED MATERIAL. (SEE DETAIL SHEET 11)

## UTILITY MAINTENANCE STATEMENT

ALL PUBLIC WATER , STORM SEWER AND SANITARY SEWER MAINS AND APPURTENANCES LOCATED IN PUBLIC ROW SHALL BE MAINTAINED BY THE CITY OF FORT LUPTON PUBLIC WORKS DEPARTMENT. ALL PUBLIC WATER , STORM SEWER, SANITARY SEWER MAINS AND APPURTENANCE S UNDER PRIVATE DRIVES ARE LOCATED IN UTILITY EASEMENTS. CITY IS RESPONSIBLE FOR MAINTENANCE OF THESE WATER,STORM AND SANITARY SEWER FACILITIES. CITY IS NOT RESPONSIBLE FOR REPAIR OR REPLACEMENT OF PRIVATE DRIVE, CURB AND GUTTER OR LANDSCAPING DAMAGED DURING UTILITY REPAIR OR MAINTENANCE.

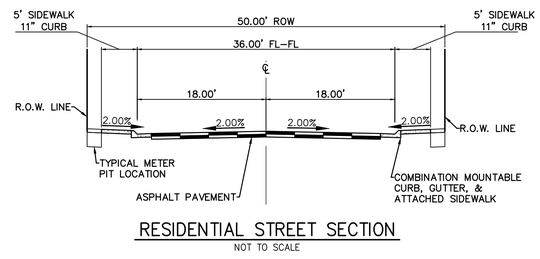
## P.U.D. LAND USE STANDARDS

SINGLE-FAMILY USES AND DENSITIES MAY BE ALLOWED ON PROPERTIES DESIGNATED MULTI-FAMILY.

SINGLE-FAMILY USES ON STANDARD LOTS. INCLUDING THE NECESSARY APPURTENANT AND ACCESSORY FACILITIES AND USES ASSOCIATED WITH SUCH LIVING AREAS. NO BUILDING OR LAND SHALL BE USED AND NO BUILDING SHALL BE HEREAFTER ERECTED OR STRUCTURALLY ALTERED , UNLESS OTHERWISE PROVIDED FOR IN THIS P.U.D., EXCEPT FOR SINGLE-FAMILY DWELLINGS. INCLUDING HOMES BUILT ON SITE . SINGLE-FAMILY DWELLINGS MAY INCLUDE HOME OCCUPATIONS.

ACCESSORY BUILDINGS TYPICALLY FOUND WITH THE ABOVE-PERMITTED USES SHALL BE ALLOWED.AN ACCESSORY BUILDING OR UTILITY SHED MAY NOT BE LOCATED SO AS TO ENCROACH ON ADJACENT PUBLIC OR PRIVATE PROPERTY OR EASEMENTS. IN NO INSTANCE SHALL AN ACCESSORY BUILDING OR UTILITY SHED BE PERMITTED IN THE FRONT YARD. SAID BUILDINGS SHALL BE SET BACK A MINIMUM OF TWENTY (20) FEET FROM ANY SIDE STREET ON A CORNER LOT. ONLY ONE (1) ACCESSORY BUILDING PER PLATTED LOT IS ALLOWED . ACCESSORY STRUCTURES SHALL ONLY BE ALLOWED AFTER THE PRINCIPAL DWELLING HAS BEEN PERMITTED AND CONSTRUCTED ON THE LOT. UTILITY SHEDS SHALL NOT BE CONSIDERED ACCESSORY BUILDINGS. BUT MAY NOT EXCEED 250 S.F. GFA.

BUILDING WALLS SHALL NOT BE WITHIN THE DEFINED SETBACKS AND EASEMENTS . ROOF OVERHANGS , CANTILEVERS , WINDOW WELLS AND FOOTERS MAY EXTEND THREE FEET OVER SETBACK LINES WHERE NOT ENCROACHING UPON EASEMENTS . REFER TO ARTICLE V SEC. 16-101 OF THE CITY OF FORT LUPTON MUNICIPAL CODE FOR GENERAL FENCING PROVISIONS. FENCING SHALL BE VINYL WITH COLOR APPROVED BY FORT LUPTON PLANNING DEPARTMENT PRIOR TO INSTALLATION.




RESIDENTIAL STREET SECTION
NOT TO SCALE

811 Know what's below. Call before you dig.

UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, JR ENGINEERING APPROVES THEIR USE ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

PREPARED FOR
LUPTON LAND, LLC
10221 PRESTWICK TRAIL
LONE TREE, CO 80124
BOB QUINETTE
303-587-1966


J·R ENGINEERING
A Westrian Company
Centennial 303-740-9393 • Colorado Springs 719-593-2593
Fort Collins 970-491-9888 • www.jrengineering.com


| No. | REVISION | BY | DATE |
|---|---|---|---|
| | | | |

| | |
|---|---|
| H-SCALE | N/A |
| V-SCALE | N/A |
| DATE | 11/17/21 |
| DESIGNED BY | ANI |
| DRAWN BY | ANI |
| CHECKED BY | |

COYOTE CREEK FILING NO. 4
COVER SHEET

SHEET 1 OF 46

JOB NO. 16093.00

# COYOTE CREEK FILING NO. 4

## GRADING AND EROSION CONTROL NOTES

A. ALL SITE GRADING (EXCAVATION, EMBANKMENT, AND COMPACTION) SHALL CONFORM TO THE RECOMMENDATIONS OF THE LATEST SOILS INVESTIGATION FOR THIS PROPERTY AND SHALL FURTHER BE IN CONFORMANCE WITH THE CITY OF FORT LUPTON'S "STANDARDS AND SPECIFICATIONS FOR THE DESIGN AND CONSTRUCTION OF PUBLIC IMPROVEMENTS," LATEST EDITION.

B. NATURAL VEGETATION SHALL BE RETAINED AND PROTECTED WHEREVER POSSIBLE. EXPOSURE OF SOIL TO EROSION BY REMOVAL OR DISTURBANCE OF VEGETATION SHALL BE LIMITED TO THE AREA REQUIRED FOR IMMEDIATE CONSTRUCTION OPERATION AND FOR THE SHORTEST PRACTICAL PERIOD OF TIME.

C. TOPSOIL SHALL BE STOCKPILED TO THE EXTENT PRACTICABLE ON THE SITE FOR USE ON AREAS TO BE REVEGETATED. ANY AND ALL STOCKPILES SHALL BE LOCATED AND PROTECTED FROM EROSIVE ELEMENTS.

D. TEMPORARY VEGETATION SHALL BE INSTALLED ON ALL DISTURBED AREAS WHERE PERMANENT SURFACE IMPROVEMENTS ARE NOT SCHEDULED FOR INSTALLATION WITHIN THREE MONTHS. VEGETATION SHALL BE A VIGOROUS, DROUGHT TOLERANT, NATIVE SPECIES MIX. (REFER TO SECTION 2.26.00 OF THESE STANDARDS AND SPECIFICATIONS FOR SEEDING MIX.) PROJECT SCHEDULING SHOULD TAKE ADVANTAGE OF SPRING OR FALL PLANTING SEASONS FOR NATURAL GERMINATION, BUT SEEDED AREAS SHALL BE IRRIGATED, IF CONDITIONS SO MERIT.

E. AT ALL TIMES, THE PROPERTY SHALL BE MAINTAINED AND/OR WATERED TO PREVENT WIND-CAUSED EROSION. EARTHWORK OPERATIONS SHALL BE DISCONTINUED WHEN FUGITIVE DUST SIGNIFICANTLY IMPACTS ADJACENT PROPERTY. IF EARTHWORK IS COMPLETE OR DISCONTINUED AND DUST FROM THE SITE CONTINUES TO CREATE PROBLEMS, THE OWNER/DEVELOPER SHALL IMMEDIATELY INSTITUTE MITIGATIVE MEASURES AND SHALL CORRECT DAMAGE TO ADJACENT PROPERTY.

F. TEMPORARY CUT/FILL SLOPES SHALL NOT EXCEED A STEEPNESS OF 2:1 (2H:1V). PERMANENT SLOPES SHALL NOT EXCEED 4:1 (4H:1V) IN AREAS TO BE SEEDED OR SODDED.

G. UTILITY CONSTRUCTION IS NOT APPROVED UNDER THIS PLAN.

H. THE OWNER/DEVELOPER SHALL PROVIDE ANY ADDITIONAL DUST ABATEMENT AND EROSION CONTROL MEASURES DEEMED NECESSARY BY THE CITY, SHOULD CONDITIONS MERIT THEM.

I. TEMPORARY FENCES SHALL BE INSTALLED ALONG ALL BOUNDARIES OF THE CONSTRUCTION LIMITS OR PROPERTY LINES AS SHOWN ON THE APPROVED EROSION CONTROL PLAN, TO PREVENT GRADING ON PROPERTY NOT OWNED BY THE DEVELOPER. IN ADDITION, THE CITY MAY REQUIRE ADDITIONAL TEMPORARY FENCES IF FIELD CONDITIONS SO MERIT THEM.

## SANITARY SEWER NOTES:

1. ALL SANITARY SEWER CONSTRUCTION SHALL CONFORM TO THE CITY OF FORT LUPTON ENGINEERING AND SPECIFICATIONS, LATEST VERSION.
2. ALL SEWER LINES SHALL BE PVC-ASTM D-3034, SDR 35 OR APPROVED EQUAL. ALL SEWER MAIN LINE SIZE 8" IN DIAMETER, UNLESS OTHERWISE NOTED.
3. SEWER LINES SHALL BE INSTALLED 5.00 FEET NORTH OR EAST OF STREET CENTERLINE, UNLESS OTHERWISE SHOWN ON PLANS. SEWER LINES SHALL BE 10.00 FEET FROM WATER LINES EXCEPT WHEN CROSSING EACH OTHER. SEWER LINES WHICH CROSS LESS THAN 1.50 FEET VERTICALLY FROM THE WATER MAIN SHALL BE ENCASED IN CONCRETE. USE RUBBER GASKETS FOR PVC ENCASEMENT.
4. SEWER RIM ELEVATIONS SHOWN ARE APPROXIMATE ONLY AND ARE NOT TO BE TAKEN AS FINAL ELEVATIONS. RING AND COVER SHALL BE SET IN CENTERED CONCRETE RINGS WITH RAM-NEK FOR ADJUSTMENT TO MATCH FINAL PAVEMENT ELEVATIONS.
5. THE CONTRACTOR AND SURVEY CREW SHALL VERIFY ELEVATIONS OF EXISTING SEWER LINES AND MANHOLES TO BE TIED TO PRIOR TO CONSTRUCTION OR STAKING OF SANITARY SEWER.
6. GRAVEL AND/OR TILE UNDERDRAINS SHALL BE INSTALLED IN ALL SEWER MAIN TRENCHES AS SHOWN ON THE SANITARY PLAN AND PROFILE SHEETS. UNDERDRAINS SHALL BE PVC-ASTM D-3034, SDR 35 INSTALLED WITHOUT GASKETS. THE CITY OF FORT LUPTON IS NOT RESPONSIBLE FOR MAINTENANCE OF UNDERDRAINS. SIZE OF UNDERDRAIN SERVICES SHALL BE 3".
7. SEWER SERVICE TEES FOR EACH UNIT SHALL BE STAKED BY A SURVEY CREW AND FURNISHED AND INSTALLED BY THE CONTRACTOR. THE CONTRACTOR SHALL FURNISH TO THE ENGINEER "AS-CONSTRUCTED" LOCATION OF TEES. SEWER WYES SHALL BE USED RATHER THAN TEES.
8. ALL MANHOLES SHALL BE 48-INCHES IN DIAMETER WITH 24-INCH RING AND COVER, ECCENTRIC CONE UNLESS OTHERWISE SPECIFIED.
9. PIPE BEDDING SHALL BE CLASS "B" AND SHALL CONFORM TO ASTM C-33 OR D-448 GRADATION NO. 6 OR 67.
10. AT LEAST FIVE (5) DAYS PRIOR TO THE START OF CONSTRUCTION, A PRE-CONSTRUCTION MEETING WILL BE HELD AT THE OFFICE OF THE PUBLIC WORKS MANAGER AND ATTENDED BY THE CONTRACTOR AND REPRESENTATIVES OF THE OTHER APPROVING AGENCIES. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO CONTACT THE PUBLIC WORKS MANAGER TO SCHEDULE THIS MEETING.
11. ALL PIPE LENGTHS ARE APPROXIMATE.
12. THE CONTRACTOR SHALL HAVE IN HIS POSSESSION AT ALL TIMES ONE (1) SIGNED COPY OF THE PLANS WHICH HAVE BEEN APPROVED BY THE CITY OF FOR LUPTON AND THE PUBLIC WORKS MANAGER.
13. ALL MANHOLES SHALL HAVE SHAPED INVERTS.
14. PRIOR TO THE START OF ANY WORK WHERE SEWER MAIN TO BE INSTALLED TIES INTO EXISTING CITY SEWER SYSTEMS, THE NEAREST MANHOLE TO THE POINT OF TIE-IN SHALL BE PLUGGED WITH A PLUMBER'S PLUG ON THE INLET SIDE BY THE CONTRACTOR. THIS PLUG SHALL REMAIN IN PLACE UNTIL FINAL ACCEPTANCE BY THE DISTRICT. IT'S PURPOSE SHALL BE TO PREVENT MUD, WATER, OR OTHER MATERIALS FROM ENTERING THE EXISTING LINE DURING CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PUMPING AND CLEANING THESE MANHOLES AND REMOVING THE PLUG WHEN SO INSTRUCTED BY THE PUBLIC WORKS MANAGER.
15. WHEN SANITARY SEWER SERVICES ARE GREATER THAN OR EQUAL TO ONE HUNDRED FEET IN LENGTH, THE CONTRACTOR SHALL INSTALL A CLEAN-OUT BEHIND THE SIDEWALK WHEN MAKING THE CONNECTION TO THE HOME.

UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, JR ENGINEERING APPROVES THEIR USE ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

PREPARED FOR
LUPTON LAND, LLC
10221 PRESTWICK TRAIL
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|---|---|
| H-SCALE | N/A |
| V-SCALE | N/A |
| DATE | 12/13/21 |
| DESIGNED BY | AJH |
| DRAWN BY | AJH |
| CHECKED BY | |

COYOTE CREEK FILING NO. 4

GENERAL NOTES

SHEET 2 OF 46

JOB NO. 16093.00

# COYOTE CREEK FILING NO. 4

## LAYER LINETYPE LEGEND

| | EXISTING | PROPOSED |
|---|---|---|
| PHASE LINE | | |
| MATCH LINE | | |
| SECTION LINE | | |
| BOUNDARY LINE | | |
| PROPERTY LINE | | |
| EASEMENT LINE | | |
| RIGHT OF WAY | | |
| R.O.W. A LINE | A | A |
| CENTERLINE | | |
| CITY LIMITS | | |
| WIRE FENCE | | |
| CHAIN LINK FENCE | | |
| WOOD FENCE | | |
| MASONRY FENCE | | |
| GUARDRAIL | | |
| CONC. BARRIER | | |
| CABLE TV | TV | TV |
| ELECTRIC | E | E |
| FIBER OPTIC | FO | FO |
| GAS MAIN | G | G |
| IRRIGATION MAIN | IRR | IRR |
| OIL/PETRO. MAIN | O | O |
| OVERHEAD UTILITY | OHU | OHU |
| SANITARY SEWER | S | |
| STORM DRAIN | | |
| TELEPHONE | T | T |
| WATER MAIN | W | |
| RAW WATER LINE | RWL | RWL |
| SWALE/WATERWAY FLOWLINE | | |
| DIVERSION DITCH | | |
| DIVERSION CHANNEL | | |
| MAJOR DRAINAGE BASIN | | |
| MINOR DRAINAGE BASIN | | |
| TOP OF SLOPE | | |
| TOE OF SLOPE | | |
| EDGE OF WATER | | |
| INDEX CONTOUR | 6100 | 6100 |
| INTERMEDIATE CONTOUR | | |
| DEPRESSION CONT. (INDEX) | 6100 | 6100 |
| DEPRESSION CONT. (INTER) | | |
| TOP OF CUTS | | |
| TOE OF FILLS | | |
| CUT AND FILL LINE | | C/F |
| SILT FENCE | SF | SF |
| 100 YEAR FLOODPLAIN | 100YR | 100YR |
| 500 YEAR FLOODPLAIN | 500YR | 500YR |
| FLOODWAY | FLDWY | FLDWY |
| BASE FLOOD ELEVATION | | |
| EDGE OF WETLANDS | | |
| STONE WALL | | |

## UTILITIES LEGEND

| | EXISTING | PROPOSED |
|---|---|---|
| **STORM SEWER** | | |
| MANHOLE | Ⓢ | ◉ |
| STORM INLET | | ▣ |
| AREA INLET – SQUARE | □ | |
| AREA INLET – ROUND | ○ | |
| FLARED END SECTION | ▷ | |
| RIPRAP | | |
| **SANITARY SEWER** | | |
| LINE MARKER | Mkr San | |
| SERVICE MARKER | | |
| CLEAN–OUT | | |
| MANHOLE W/ DIRECTIONAL FLOW ARROW | Ⓢ | |
| **WATER LINE** | | |
| LINE MARKER | Mkr W | |
| SERVICE MARKER | | |
| FIRE HYDRANT | | |
| FIRE CONNECTION | | |
| MANHOLE | Ⓦ | |
| BEND | | |
| BLOW–OFF VALVE | | |
| WELL | WELL | |
| METER | Ⓜ | |
| VALVE | | |
| REDUCER | | |
| THRUST BLOCK | | |
| CROSS | | |
| PLUG W/ THRUST BLOCK | | |
| TEE | | |
| REVERSE ANCHOR | | |
| ANODE | | |
| AIR & VACUUM VALVE ASSEMBLY | | |
| TRANSMISSION BLOW–OFF ASSEMBLY | | |
| **GAS LINE** | | |
| MARKER | Mkr G | |
| SERVICE MARKER | | |
| METER | Ⓖ | |
| VALVE | | |
| PLUG | | |
| TEE | | |
| **DRY UTILITIES** | | |
| CABLE TV MARKER | Mkr TV | |
| CABLE TELEVISION PEDESTAL | TV | |
| ELECTRIC MARKER | Mkr E | |
| ELECTRIC SERVICE MARKER | | |
| ELECTRICAL PEDESTAL | E | |
| ELECTRICAL METER | Ⓔ | |
| ELECTRICAL MANHOLE | Ⓔ | |
| FIBER–OPTIC MARKER | Mkr FO | |
| IRRIGATION PEDESTAL | I | |
| TELEPHONE MARKER | Mkr T | |
| TELEPHONE PEDESTAL | T | |
| TELEPHONE MANHOLE | Ⓣ | |
| UTILITY POLE | | |
| GUY ANCHOR | | |
| GUY POLE | | |
| **MISC. UTILITIES** | | |
| VENT PIPE | VP | VP |
| TEST HOLE DESIGNATOR | TH# FIRM AGENCY | |

## MONUMENTATION LEGEND

| | |
|---|---|
| ALUMINUM CAP – FOUND | AC |
| BRASS CAP – FOUND | BC |
| BENCHMARK – FOUND | |
| CROSS – FOUND | + |
| MONUMENT – SET | ○ |
| MONUMENT – FOUND (DEFAULT) | ● |
| MONUMENT – FOUND (ALTERNATE 1) | ■ |
| MONUMENT – FOUND (ALTERNATE 2) | ◉ |
| MONUMENT – FOUND (ALTERNATE 3) | ▲ |
| MONUMENT – FOUND (ALTERNATE 4) | ◬ |
| MONUMENT – FOUND (ALTERNATE 5) | ⬟ |
| MONUMENT – FOUND (ALTERNATE 6) | ❁ |
| MONUMENT – FOUND (ALTERNATE 7) | ⟁ |
| NAIL & WASHER – FOUND | NAIL & WASHER |
| PANEL – FOUND | |
| PK NAIL – FOUND | PK NAIL |
| ROW MONUMENT – FOUND | |
| ROW MARKER – FOUND | ⊡ |
| SECTION CORNER – FOUND | |
| SECTION CORNER – SET | |
| QUARTER–SECTION CORNER – FOUND | |
| QUARTER–SECTION CORNER – SET | |
| SECTION CENTER – FOUND | |
| SECTION CENTER – FOUND | |
| CONTROL/TRAVERSE POINT – SET | △ |

## TRAFFIC LEGEND

| | EXISTING | PROPOSED |
|---|---|---|
| PARKING METER | | |
| TRAFFIC SIGNAL BOX | | |
| TRAFFIC SIGNAL POLE | | |
| TRAFFIC SIGNAL | | |
| BARRICADE | | |
| GUARD RAIL POST | | |
| IMPACT ATTENUATOR | | |
| BRIDGE STYLE HIGHWAY SIGN POST | | |
| CANTILEVER STYLE HIGHWAY SIGN POST | | |
| SIGN | | |
| RAILROAD MARKER/SIGN | RR | |
| STREET LIGHT | | |
| STREET LIGHT – SINGLE | | |
| STREET LIGHT – DOUBLE | | |
| LUMINAIRE | | |
| ALTERNATE LUMINAIRE | | |
| SIGNAL MAST ARM W/ LUMINAIRE | | |
| PEDESTAL POLE FOUNDATION | | |
| TRAFFIC SIGNAL POLE | | |
| ROUND PULL BOX | | |
| MEDIUM PULL BOX | | |
| LARGE PULL BOX (20X33X15) | | |
| SIGNAL HEAD WITHOUT BACK PLATE | | |
| SIGNAL HEAD WITH BACK PLATE | | |
| PEDESTRIAN SIGNAL HEAD | | |
| VIDEO IMAGE DETECTOR | | |
| OPTICOM DETECTOR | | |
| VEHICLE DETECTION ZONE | | V |

## STORM WATER MANAGEMENT

| | KEY | SYMBOL |
|---|---|---|
| CHECK DAM | CD | |
| CONSTRUCTION ROAD STABILIZATION | CRS | |
| CURB SOCK INLET PROTECTION | CS | |
| CONCRETE WASHOUT AREA | CWA | |
| DIVERSION DITCH AND DIKE, TEMPORARY | DD | |
| DIVERSION CHANNEL, TEMPORARY | DV | |
| DEWATERING | DW | |
| EROSION CONTROL BLANKET | ECB | |
| INLET FILTER | IF | |
| INLET PROTECTION | IP | |
| MULCHING | MU | |
| OUTLET PROTECTION | OP | |
| PAVED FLUME | PF | |
| PERMENENT SEEDING | PS | |
| REINFORCED CONCRETE DAM | RCD | |
| ROUGH CUT STREET CONTROL | RCS | |
| SEDIMENT BASIN | SB | |
| SEDIMENT CONTROL LOG | SCL | |
| SILT FENCE | SF | |
| SURFACE ROUGHENING | SR | |
| STABILIZED STAGING AREA | SSA | |
| SEDIMENT TRAP | ST | |
| STRAW BALE BARRIER | STB | |
| TERRACING | TER | |
| TEMPORARY SEEDING | TS | |
| TEMPORARY STREAM CROSSING CULVERT/BRIDGE | TSC C | |
| TEMPORARY STREAM CROSSING FORD TYPE | TSC F | |
| TEMPORARY SLOPE DRAIN | TSD | |
| VEHICLE TRACKING CONTROL | VTC | |
| VEHICLE TRACKING CONTROL WITH WASH RACK | WR | |

## DRAINAGE REPORT PLANS

| | KEY |
|---|---|
| BASIN DESIGNATION (NO COEFFICIENT) | # / #.# |
| BASIN DESIGNATION (1 COEFFICIENT) | # / #.# \| # |
| BASIN DESIGNATION (2 COEFFICIENTS) | # / #.# \| # |
| ANALISYS POINT IDENTIFIER | # |
| BASIN DESIGNATION (HISTORIC) | # / #.# |
| BASIN DESIGNATION (DEVELOPED) | # / #.# |
| SUB–BASIN DESIGNATION (DEVELOPED) | # / ## |
| DRAINAGE PIPE IDENTIFIER | ## |
| DRAINAGE POINT IDENTIFIER (HEXAGONAL) | ## |
| DRAINAGE POINT IDENTIFIER (TRIANGULAR) | ? |
| SWMM DESIGNATION 1 | # |
| SWMM DESIGNATION 2 | # |
| SWMM DESIGNATION 3 | # |
| SWMM DESIGNATION 4 | ? |

## LANDSCAPE LEGEND

| | EXISTING | PROPOSED |
|---|---|---|
| TREE – CONIFEROUS | | |
| TREE – DECIDUOUS | | |
| SHRUB/BUSH | | |
| SHRUBS AND BUSHES | | |
| IRRIGATION BOX | | |
| IRRIGATION SPRINKLER | | |
| IRRIGATION VALVE | | |
| BOLLARD | | |
| FLAGPOLE | | FP |

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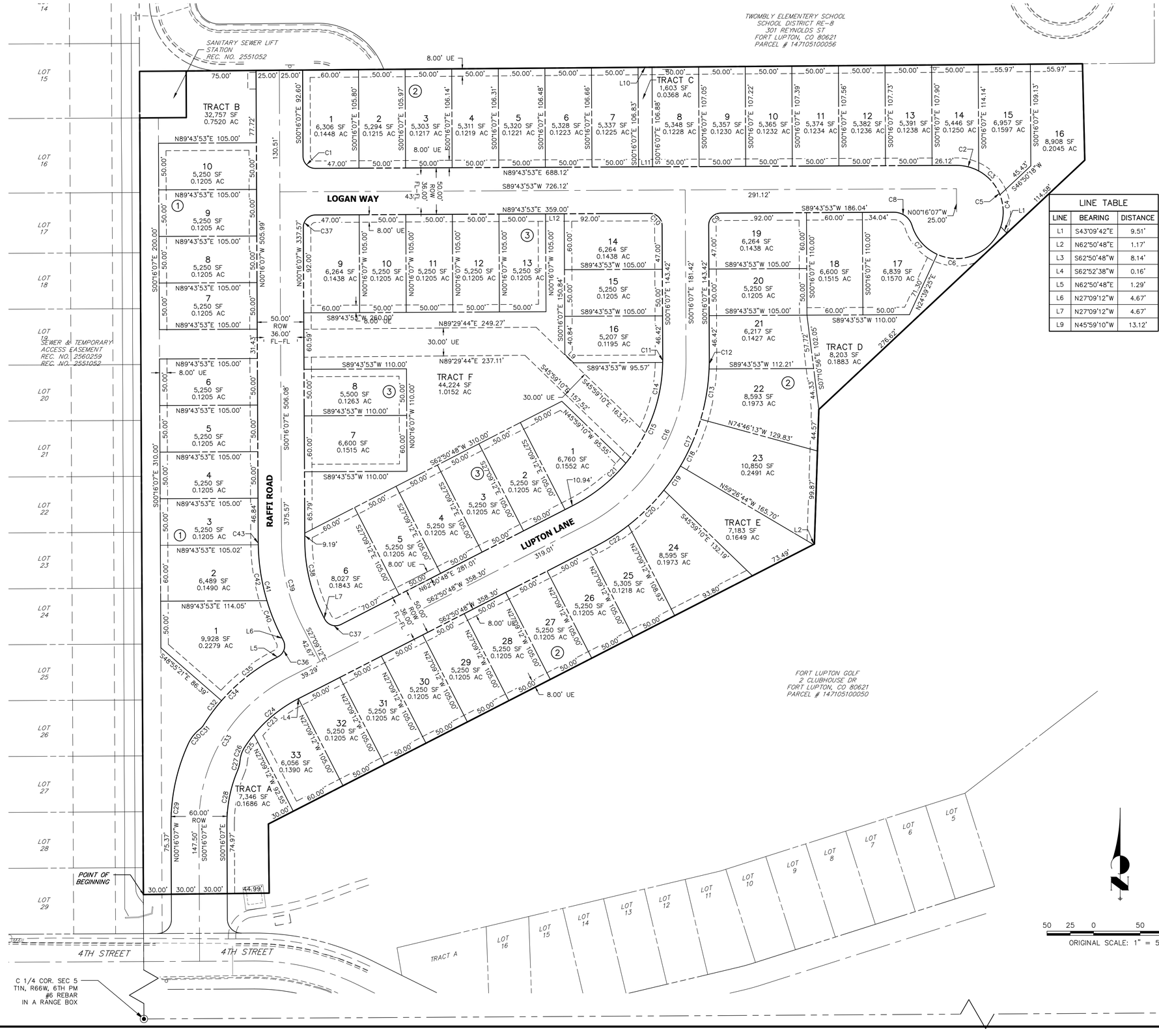
| H-SCALE | N/A |
| V-SCALE | N/A |
| DATE | 12/13/21 |
| DESIGNED BY | AJH |
| DRAWN BY | AJH |
| CHECKED BY | |

COYOTE CREEK FILING NO. 4

OVERALL LEGEND

SHEET 3 OF 46

JOB NO. 16093.00




| LINE TABLE | | |
|---|---|---|
| LINE | BEARING | DISTANCE |
| L1 | S43°09'42"E | 9.51' |
| L2 | N62°50'48"E | 1.17' |
| L3 | S62°50'48"W | 8.14' |
| L4 | S62°52'38"W | 0.16' |
| L5 | N62°50'48"E | 1.29' |
| L6 | N27°09'12"W | 4.67' |
| L7 | N27°09'12"W | 4.67' |
| L9 | N45°59'10"W | 13.12' |

| CURVE TABLE | | | | |
|---|---|---|---|---|
| CURVE | DELTA | RADIUS | LENGTH | CHORD |
| C1 | 90°00'00" | 13.00' | 20.42' | S45°16'07"E 18.38' |
| C2 | 28°31'44" | 50.00' | 24.90' | N76°00'15"W 24.64' |
| C3 | 40°06'33" | 50.00' | 35.00' | N41°41'07"W 34.29' |
| C4 | 40°06'33" | 50.00' | 35.00' | N01°34'34"W 34.29' |
| C5 | 253°23'54" | 50.00' | 221.13' | N36°25'51"E 80.18' |
| C8 | 73°23'54" | 20.00' | 25.62' | N53°34'09"W 23.90' |
| C9 | 90°00'00" | 13.00' | 20.42' | S44°43'53"W 18.38' |
| C10 | 90°00'00" | 13.00' | 20.42' | N45°16'07"W 18.38' |
| C11 | 1°10'19" | 175.00' | 3.58' | N00°19'03"E 3.58' |
| C12 | 2°46'17" | 225.00' | 10.88' | N01°07'02"E 10.88' |
| C13 | 13°56'57" | 225.00' | 54.78' | N09°28'39"E 54.64' |
| C14 | 38°23'55" | 175.00' | 117.28' | N20°06'10"E 115.10' |
| C15 | 63°06'55" | 175.00' | 192.77' | N31°17'21"E 183.17' |
| C17 | 63°06'55" | 225.00' | 247.85' | N31°17'21"E 235.51' |
| C18 | 13°58'29" | 225.00' | 54.88' | N23°26'23"E 54.74' |
| C19 | 8°00'31" | 225.00' | 31.45' | N34°25'53"E 31.42' |
| C20 | 13°41'21" | 225.00' | 53.76' | N45°16'49"E 53.63' |
| C21 | 23°32'40" | 175.00' | 71.91' | N51°04'28"E 71.41' |
| C22 | 10°43'19" | 225.00' | 42.10' | N57°29'09"E 42.04' |
| C23 | 23°30'43" | 150.00' | 61.55' | S51°05'27"W 61.12' |

| CURVE TABLE | | | | |
|---|---|---|---|---|
| CURVE | DELTA | RADIUS | LENGTH | CHORD |
| C24 | 29°55'48" | 150.00' | 78.36' | S47°52'54"W 77.47' |
| C25 | 6°25'05" | 150.00' | 16.80' | S36°07'33"W 16.79' |
| C26 | 27°40'04" | 32.00' | 15.45' | S19°04'59"W 15.30' |
| C27 | 17°37'16" | 36.00' | 11.07' | N14°03'35"E 11.03' |
| C28 | 23°08'19" | 145.00' | 58.56' | S11°18'03"W 58.16' |
| C29 | 24°48'28" | 205.00' | 88.76' | S12°08'07"W 88.07' |
| C30 | 27°59'58" | 42.00' | 20.52' | S38°32'20"W 20.32' |
| C31 | 20°50'59" | 15.00' | 5.46' | N42°06'50"E 5.43' |
| C32 | 9°23'19" | 200.00' | 32.77' | S36°22'59"W 32.74' |
| C34 | 31°09'28" | 200.00' | 108.76' | S47°16'04"W 107.43' |
| C35 | 21°46'10" | 200.00' | 75.99' | S51°57'44"W 75.53' |
| C36 | 90°00'00" | 13.00' | 20.42' | N17°50'48"E 18.38' |
| C37 | 90°00'00" | 13.00' | 20.42' | S44°43'53"W 18.38' |
| C37 | 90°00'00" | 13.00' | 20.42' | S72°09'12"E 18.38' |
| C38 | 26°53'05" | 175.00' | 82.11' | S13°42'39"E 81.36' |
| C40 | 10°34'57" | 225.00' | 41.56' | S21°51'43"E 41.50' |
| C41 | 26°53'05" | 225.00' | 105.58' | S13°42'39"E 104.61' |
| C42 | 15°29'53" | 225.00' | 60.86' | S08°49'19"E 60.67' |
| C43 | 0°48'16" | 225.00' | 3.16' | S00°40'14"E 3.16' |

811 Know what's below. Call before you dig.

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|---|---|---|---|

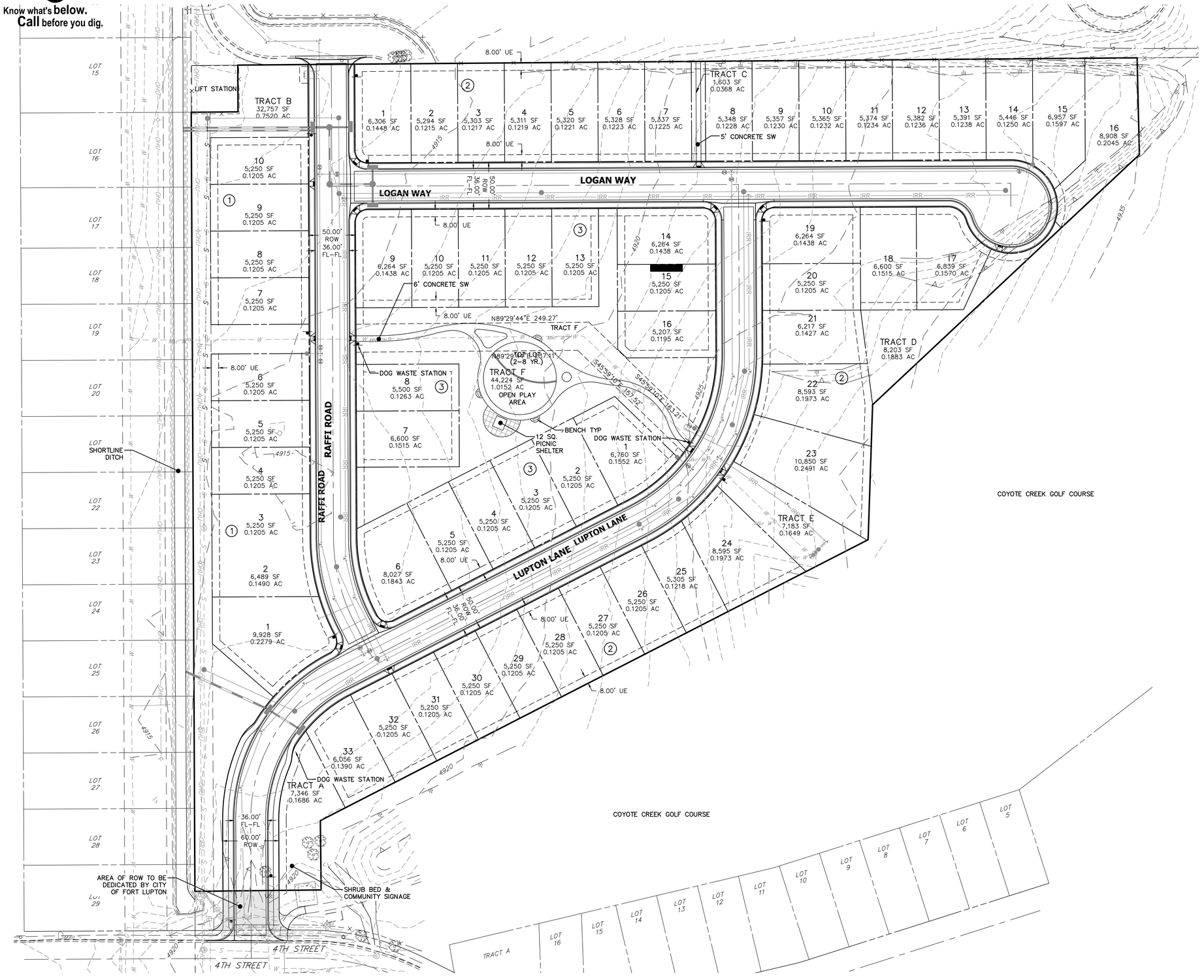
H-SCALE 1"=50'
V-SCALE 1"=X'
DATE 12/13/21
DESIGNED BY ANI
DRAWN BY ANI
CHECKED BY

# COYOTE CREEK FILING NO. 4
## PUD FINAL PLAT

SHEET 4 OF 46
JOB NO. 16093.00

# COYOTE CREEK FILING NO. 4

Know what's **below.** **Call** before you dig.




## SITE LEGEND

- BOUNDARY LINE
- PROPERTY LINE
- EXISTING EASEMENT LINE
- PROPOSED EASEMENT LINE
- RIGHT OF WAY
- EXISTING WOODEN FENCE
- EXISTING GAS MAIN
- EXISTING SANITARY SEWER
- PROPOSED SANITARY SEWER
- EXISTING WATER MAIN
- PROPOSED WATER MAIN
- PROPOSED ELECTRIC
- EXISTING STORM DRAIN
- PROPOSED STORM DRAIN
- EXISTING CURB AND GUTTER
- PROPOSED SIGN
- PROPOSED CURB AND GUTTER
- EXISTING STREET LIGHTS
- PROPOSED STREET LIGHT
- 3/4" METER VAULTS
- FIRE HYDRANT

50 25 0 50 100

ORIGINAL SCALE: 1" = 50'

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| H-SCALE | 1"=50' |
| V-SCALE | 1"=X' |
| DATE | 12/13/21 |
| DESIGNED BY | AJH |
| DRAWN BY | XXX |
| CHECKED BY | |

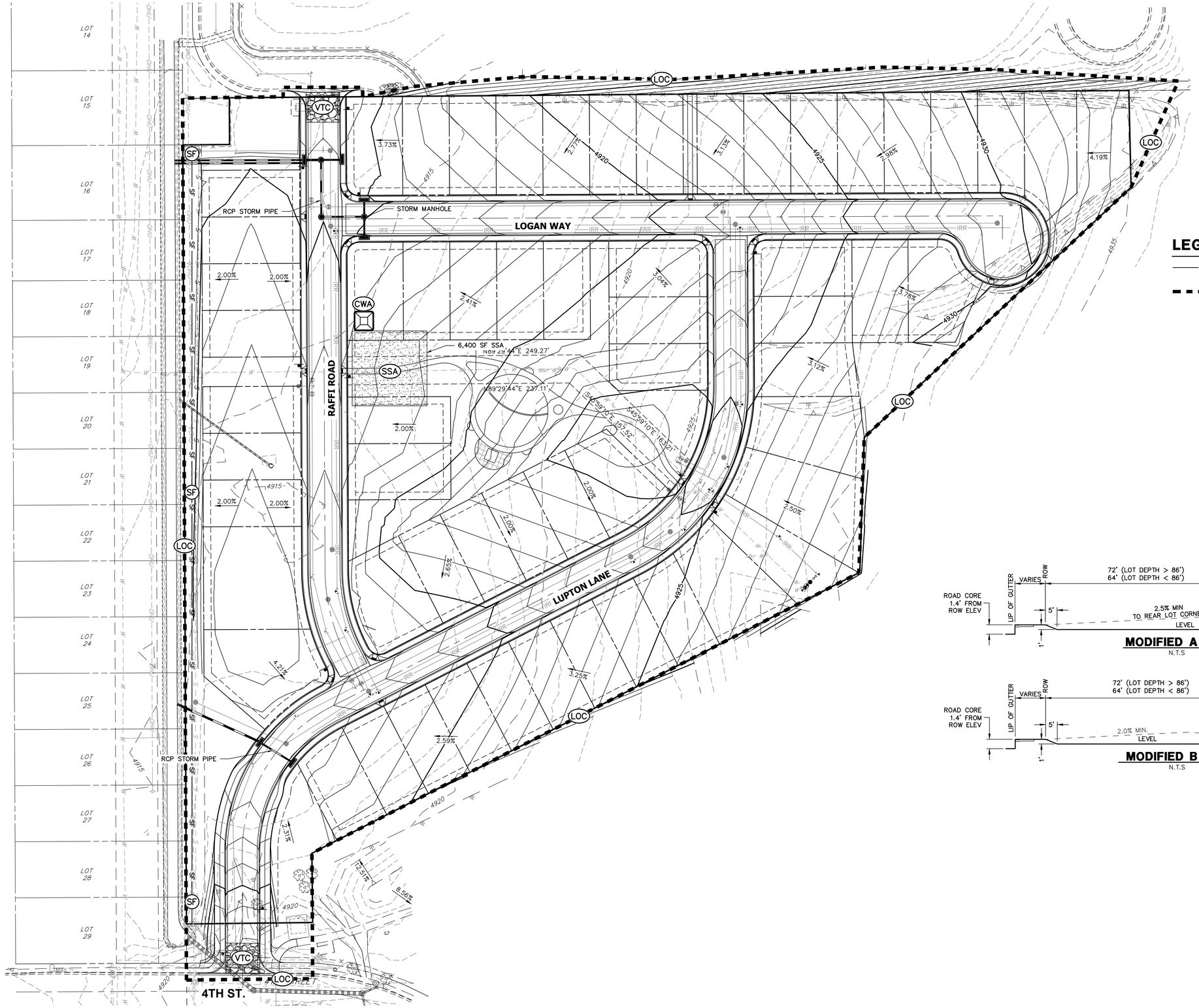
COYOTE CREEK FILING NO. 4

FINAL SITE PLAN

SHEET 5 OF 46

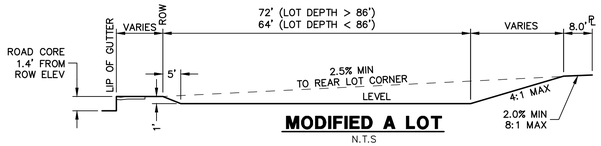
JOB NO. 16093.00

# COYOTE CREEK FILING NO. 4

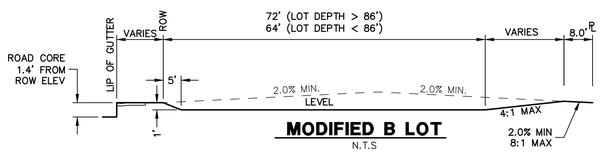



## LEGEND

- SF — SILT FENCE
- LOC — LIMITS OF CONSTRUCTION
- VTC — VEHICLE TRACKING CONTROL
- CWA — CONCRETE WASHOUT AREA
- IP — INLET PROTECTION
- SCL — SEDIMENT CONTROL LOG
- SSA — STABILIZED STAGING AREA




**MODIFIED A LOT**
N.T.S




**MODIFIED B LOT**
N.T.S

N

50 25 0 50 100
ORIGINAL SCALE: 1" = 50'

811 Know what's below. Call before you dig.

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Fort Collins 970-491-9888 • www.jrengineering.com


| No. | REVISION | BY | DATE |
|---|---|---|---|
| | | | |

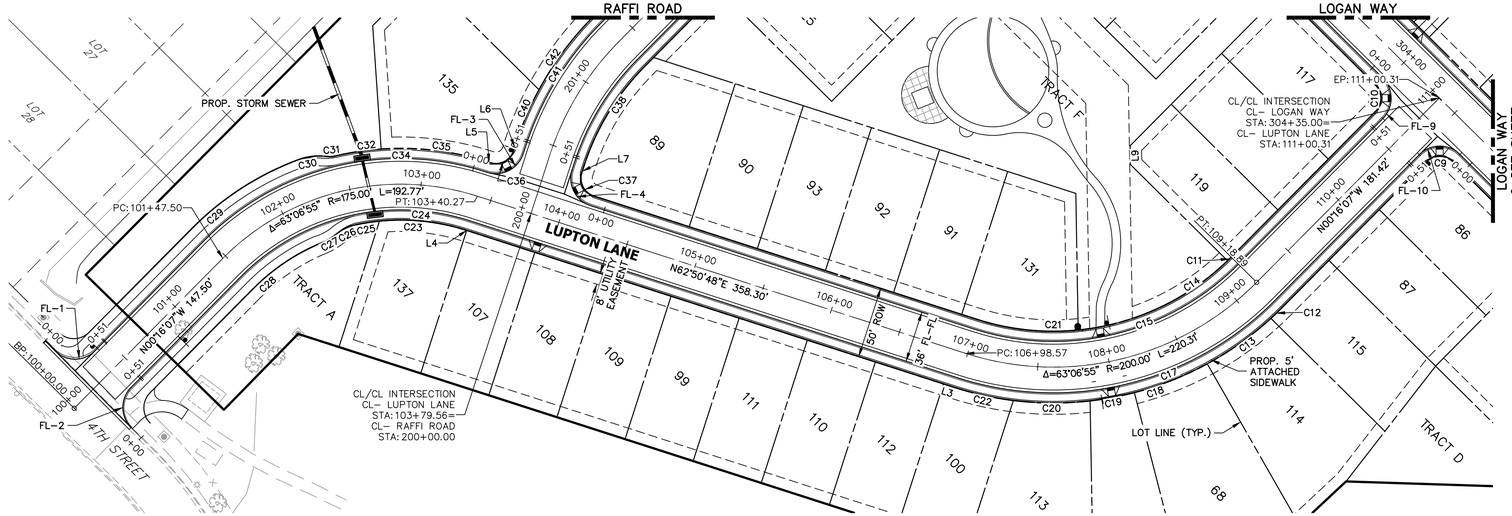
| | | | |
|---|---|---|---|
| H-SCALE | 1"=50' | DESIGNED BY | AJH |
| V-SCALE | N/A | DRAWN BY | CRB |
| DATE | 12/13/21 | CHECKED BY | |

COYOTE CREEK FILING NO. 4

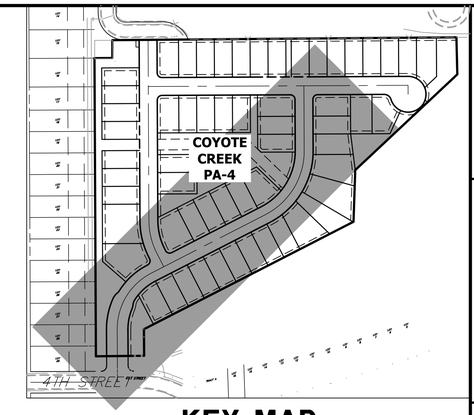
FINAL GRADING & EROSION CONTROL PLAN

SHEET 4 OF 46

JOB NO. 16093.00

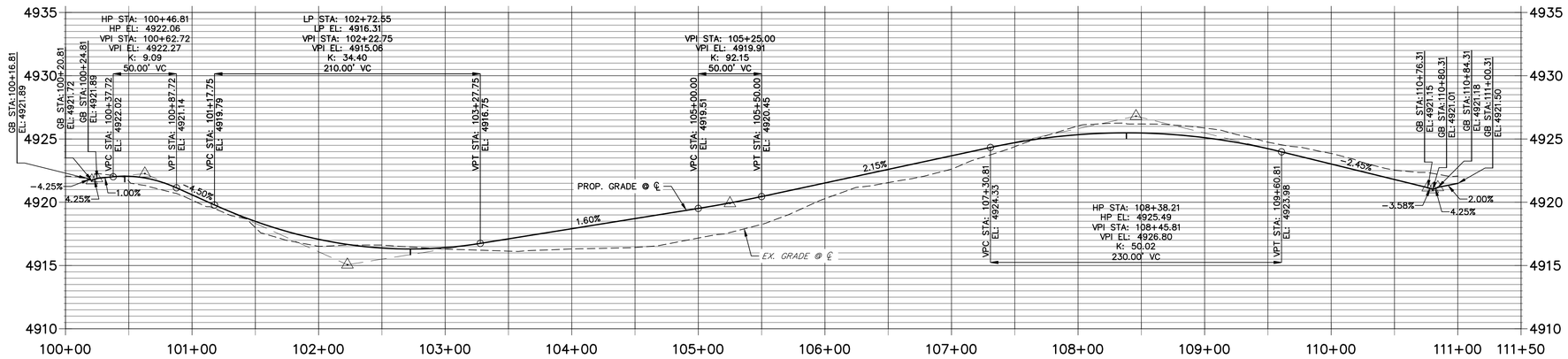



LUPTON LANE
STA. 100+00.00 TO 111+00.31




**KEY MAP**
N.T.S.

# CL- LUPTON LANE PROFILE
# STA 100+00.00 TO 111+50.00

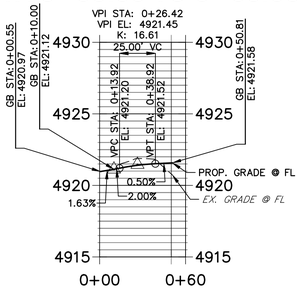



| LINE TABLE | | |
|---|---|---|
| LINE | BEARING | DISTANCE |
| L1 | S43°09'42"E | 9.51' |
| L2 | N62°50'48"E | 1.17' |
| L3 | S62°50'48"W | 8.14' |
| L4 | S62°52'38"W | 0.16' |
| L5 | N62°50'48"E | 1.29' |
| L6 | N27°09'12"W | 4.67' |
| L7 | N27°09'12"W | 4.67' |
| L9 | N45°59'10"W | 13.12' |

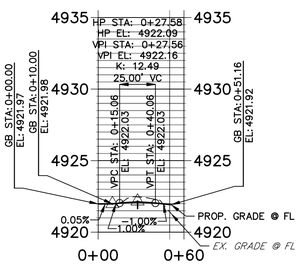
| CURVE TABLE | | | | |
|---|---|---|---|---|
| CURVE | DELTA | RADIUS | LENGTH | CHORD |
| C1 | 90°00'00" | 13.00' | 20.42' | S45°16'07"E 18.38' |
| C2 | 28°31'44" | 50.00' | 24.90' | N76°00'15"W 24.64' |
| C3 | 40°06'33" | 50.00' | 35.00' | N41°41'07"W 34.29' |
| C4 | 40°06'33" | 50.00' | 35.00' | N01°34'34"W 34.29' |
| C5 | 253°23'54" | 50.00' | 221.13' | N36°25'51"E 80.18' |
| C8 | 73°23'54" | 20.00' | 25.62' | N53°34'09"W 23.90' |
| C9 | 90°00'00" | 13.00' | 20.42' | S44°43'53"W 18.38' |
| C10 | 90°00'00" | 13.00' | 20.42' | N45°16'07"W 18.38' |
| C11 | 1°10'19" | 175.00' | 3.58' | N00°19'03"E 3.58' |
| C12 | 2°46'17" | 225.00' | 10.88' | N01°07'02"E 10.88' |
| C13 | 13°56'57" | 225.00' | 54.78' | N09°28'39"E 54.64' |
| C14 | 38°23'55" | 175.00' | 117.28' | N20°06'10"E 115.10' |
| C15 | 63°06'55" | 175.00' | 192.77' | N31°17'21"E 183.17' |
| C17 | 63°06'55" | 225.00' | 247.85' | N31°17'21"E 235.51' |
| C18 | 13°58'29" | 225.00' | 54.88' | N23°26'23"E 54.74' |
| C19 | 8°00'31" | 225.00' | 31.45' | N34°25'53"E 31.42' |
| C20 | 13°41'21" | 225.00' | 53.76' | N45°16'49"E 53.63' |
| C21 | 23°32'40" | 175.00' | 71.91' | N51°04'28"E 71.41' |
| C22 | 10°43'19" | 225.00' | 42.10' | N57°29'09"E 42.04' |
| C23 | 23°30'43" | 150.00' | 61.55' | S51°05'27"W 61.12' |

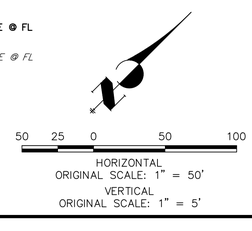
| CURVE TABLE | | | | |
|---|---|---|---|---|
| CURVE | DELTA | RADIUS | LENGTH | CHORD |
| C24 | 29°55'48" | 150.00' | 78.36' | S47°52'54"W 77.47' |
| C25 | 6°25'05" | 150.00' | 16.80' | S36°07'33"W 16.79' |
| C26 | 27°40'04" | 32.00' | 15.45' | S19°04'59"W 15.30' |
| C27 | 17°37'16" | 36.00' | 11.07' | N14°03'35"E 11.03' |
| C28 | 23°08'19" | 145.00' | 58.56' | S11°18'03"W 58.16' |
| C29 | 24°48'28" | 205.00' | 88.76' | S12°08'07"W 88.07' |
| C30 | 27°59'58" | 42.00' | 20.52' | S38°32'20"W 20.32' |
| C31 | 20°50'59" | 15.00' | 5.46' | N42°06'50"E 5.43' |
| C32 | 9°23'19" | 200.00' | 32.77' | S36°22'59"W 32.74' |
| C34 | 31°09'28" | 200.00' | 108.76' | S47°16'04"W 107.43' |
| C35 | 21°46'10" | 200.00' | 75.99' | S51°57'44"W 75.53' |
| C36 | 90°00'00" | 13.00' | 20.42' | N17°50'48"E 18.38' |
| C37 | 90°00'00" | 13.00' | 20.42' | S44°43'53"W 18.38' |
| C37 | 90°00'00" | 13.00' | 20.42' | S72°09'12"E 18.38' |
| C38 | 26°53'05" | 175.00' | 82.11' | S13°42'39"E 81.36' |
| C40 | 10°34'57" | 225.00' | 41.56' | S21°51'43"E 41.50' |
| C41 | 26°53'05" | 225.00' | 105.58' | S13°42'39"E 104.61' |
| C42 | 15°29'53" | 225.00' | 60.86' | S08°49'19"E 60.67' |
| C43 | 0°48'16" | 225.00' | 3.16' | S00°40'14"E 3.16' |

## FL-1 PROFILE
## STA 0+00.00 TO 0+60.00




## FL-2 PROFILE
## STA 0+00.00 TO 0+60.00




HORIZONTAL
ORIGINAL SCALE: 1" = 50'
VERTICAL
ORIGINAL SCALE: 1" = 5'

Know what's **below.**
**Call** before you dig.

## ENGINEER'S STATEMENT

PREPARED UNDER MY DIRECT SUPERVISION

COLORADO LICENSED ANDREW J. HUGILL 57007 PROFESSIONAL ENGINEER

ANDREW J. HUGILL, PE
COLORADO LIC. PE NO. 57007
FOR AND ON BEHALF OF JR ENGINEERING, LLC.

DATE

UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, JR ENGINEERING APPROVES THEIR USE ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

PREPARED FOR
LUPTON LAND, LLC
10221 PRESTWICK TRAIL
LONE TREE, CO 80124
BOB QUINETTE
P-303.587.1966

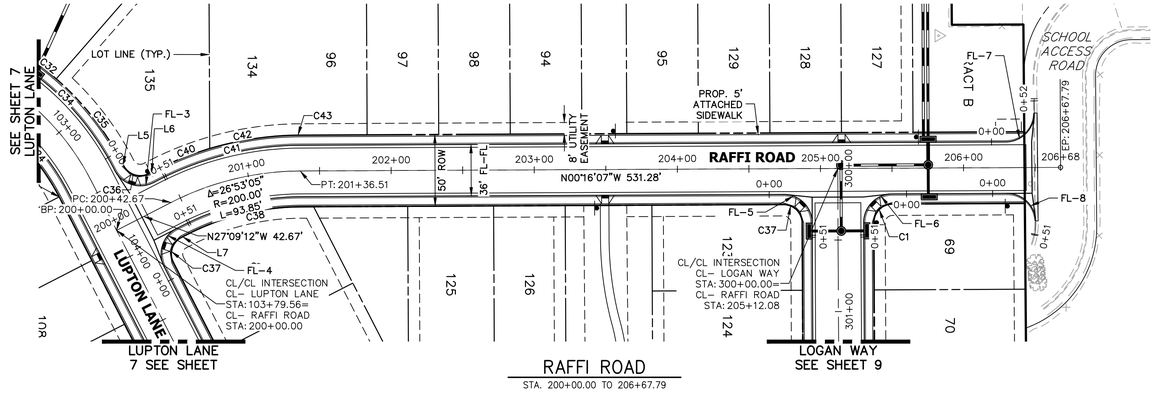
J·R ENGINEERING
A Westrian Company
Centennial 303-740-9393 • Colorado Springs 719-593-2593
Fort Collins 970-491-9888 • www.jrengineering.com

| No. | REVISION | BY | DATE |
|---|---|---|---|
| | | | |

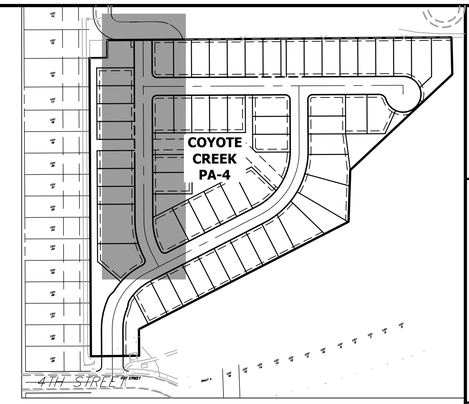
| | |
|---|---|
| H-SCALE | 1"=50' |
| V-SCALE | 1"=5' |
| DATE | 12/13/21 |
| DESIGNED BY | AJH |
| DRAWN BY | CRB |
| CHECKED BY | |

COYOTE CREEK FILING NO. 4
FINAL STREET PLAN AND PROFILE

SHEET 7 OF 46
JOB NO. 16093.00

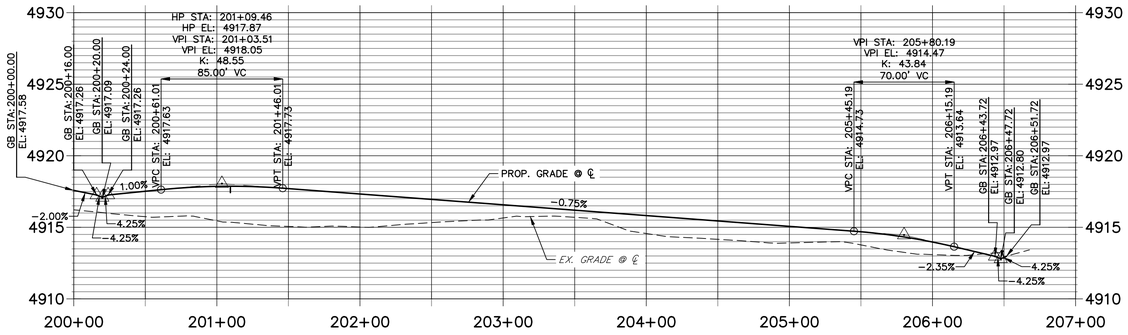



RAFFI ROAD
STA. 200+00.00 TO 206+67.79

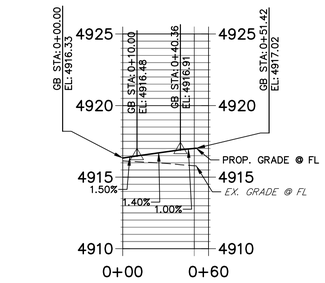



## KEY MAP
N.T.S.

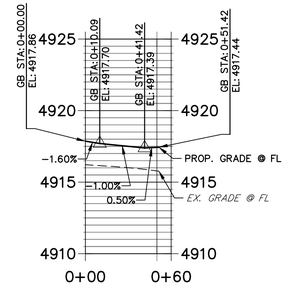
## CL- RAFFI ROAD PROFILE
## STA 200+00.00 TO 207+00.00



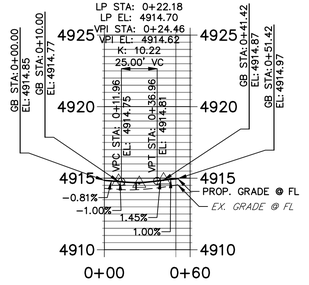

## FL-3 PROFILE
## STA 0+00.00 TO 0+60.00



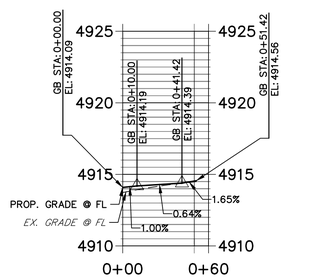

## FL-4 PROFILE
## STA 0+00.00 TO 0+60.00



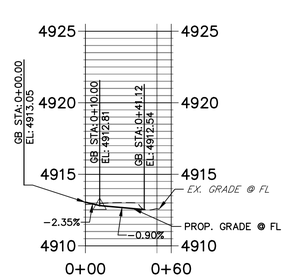

## FL-5 PROFILE
## STA 0+00.00 TO 0+60.00



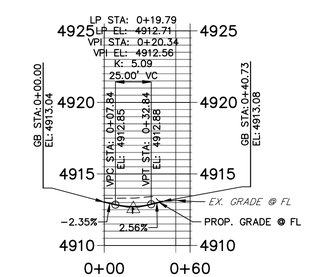

## FL-6 PROFILE
## STA 0+00.00 TO 0+60.00




## FL-7 PROFILE
## STA 0+00.00 TO 0+60.00




## FL-8 PROFILE
## STA 0+00.00 TO 0+60.00




| LINE TABLE | | |
|---|---|---|
| LINE | BEARING | DISTANCE |
| L1 | S43°09'42"E | 9.51' |
| L2 | N62°50'48"E | 1.17' |
| L3 | S62°50'48"W | 8.14' |
| L4 | S62°52'38"W | 0.16' |
| L5 | N62°50'48"E | 1.29' |
| L6 | N27°09'12"W | 4.67' |
| L7 | N27°09'12"W | 4.67' |
| L9 | N45°59'10"W | 13.12' |

| CURVE TABLE | | | | |
|---|---|---|---|---|
| CURVE | DELTA | RADIUS | LENGTH | CHORD |
| C1 | 90°00'00" | 13.00' | 20.42' | S45°16'07"E 18.38' |
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| C3 | 40°06'33" | 50.00' | 35.00' | N41°41'07"W 34.29' |
| C4 | 40°06'33" | 50.00' | 35.00' | N01°34'34"W 34.29' |
| C5 | 253°23'54" | 50.00' | 221.13' | N36°25'51"E 80.18' |
| C8 | 73°23'54" | 20.00' | 25.62' | N53°34'09"W 23.90' |
| C9 | 90°00'00" | 13.00' | 20.42' | S44°43'53"W 18.38' |
| C10 | 90°00'00" | 13.00' | 20.42' | N45°16'07"W 18.38' |
| C11 | 1°10'19" | 175.00' | 3.58' | N00°19'03"E 3.58' |
| C12 | 2°46'17" | 225.00' | 10.88' | N01°07'02"E 10.88' |
| C13 | 13°56'57" | 225.00' | 54.78' | N09°28'39"E 54.64' |
| C14 | 38°23'55" | 175.00' | 117.28' | N20°06'10"E 115.10' |
| C15 | 63°06'55" | 175.00' | 192.77' | N31°17'21"E 183.17' |
| C17 | 63°06'55" | 225.00' | 247.85' | N31°17'21"E 235.51' |
| C18 | 13°58'29" | 225.00' | 54.88' | N23°26'23"E 54.74' |
| C19 | 8°00'31" | 225.00' | 31.45' | N34°25'53"E 31.42' |
| C20 | 13°41'21" | 225.00' | 53.76' | N45°16'49"E 53.63' |
| C21 | 23°32'40" | 175.00' | 71.91' | N51°04'28"E 71.41' |
| C22 | 10°43'19" | 225.00' | 42.10' | N57°29'09"E 42.04' |
| C23 | 23°30'43" | 150.00' | 61.55' | S51°05'27"W 61.12' |

| CURVE TABLE | | | | |
|---|---|---|---|---|
| CURVE | DELTA | RADIUS | LENGTH | CHORD |
| C24 | 29°55'48" | 150.00' | 78.36' | S47°52'54"W 77.47' |
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| C26 | 27°40'04" | 32.00' | 15.45' | S19°04'59"W 15.30' |
| C27 | 17°37'16" | 36.00' | 11.07' | N14°03'35"E 11.03' |
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| C29 | 24°48'28" | 205.00' | 88.76' | S12°08'07"W 88.07' |
| C30 | 27°59'58" | 42.00' | 20.52' | S38°32'20"W 20.32' |
| C31 | 20°50'59" | 15.00' | 5.46' | N42°06'50"E 5.43' |
| C32 | 9°23'19" | 200.00' | 32.77' | S36°22'59"W 32.74' |
| C34 | 31°09'28" | 200.00' | 108.76' | S47°16'04"W 107.43' |
| C35 | 21°46'10" | 200.00' | 75.99' | S51°57'44"W 75.53' |
| C36 | 90°00'00" | 13.00' | 20.42' | N17°50'48"E 18.38' |
| C37 | 90°00'00" | 13.00' | 20.42' | S44°43'53"W 18.38' |
| C37 | 90°00'00" | 13.00' | 20.42' | S72°09'12"E 18.38' |
| C38 | 26°53'05" | 175.00' | 82.11' | S13°42'39"E 81.36' |
| C40 | 10°34'57" | 225.00' | 41.56' | S21°51'43"E 41.50' |
| C41 | 26°53'05" | 225.00' | 105.58' | S13°42'39"E 104.61' |
| C42 | 15°29'53" | 225.00' | 60.86' | S08°49'19"E 60.67' |
| C43 | 0°48'16" | 225.00' | 3.16' | S00°40'14"E 3.16' |

Know what's below. Call before you dig.

50 25 0 50 100

HORIZONTAL
ORIGINAL SCALE: 1" = 50'
VERTICAL
ORIGINAL SCALE: 1" = 5'

## ENGINEER'S STATEMENT

PREPARED UNDER MY DIRECT SUPERVISION

COLORADO REGISTERED ANDREW J. HUGILL 57007 PROFESSIONAL ENGINEER

ANDREW J. HUGILL, PE DATE
COLORADO LIC. PE NO. 57007
FOR AND ON BEHALF OF JR ENGINEERING, LLC.

UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, JR ENGINEERING APPROVES THEIR USE ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

PREPARED FOR
LUPTON LAND, LLC
10221 PRESTWICK TRAIL
LONE TREE, CO 80124
BOB QUINETTE
P-303.587.1966

J·R ENGINEERING
A Westrian Company
Centennial 303-740-9393 • Colorado Springs 719-593-2593
Fort Collins 970-491-9888 • www.jrengineering.com

| No. | REVISION | BY | DATE |
|---|---|---|---|
| | | | |

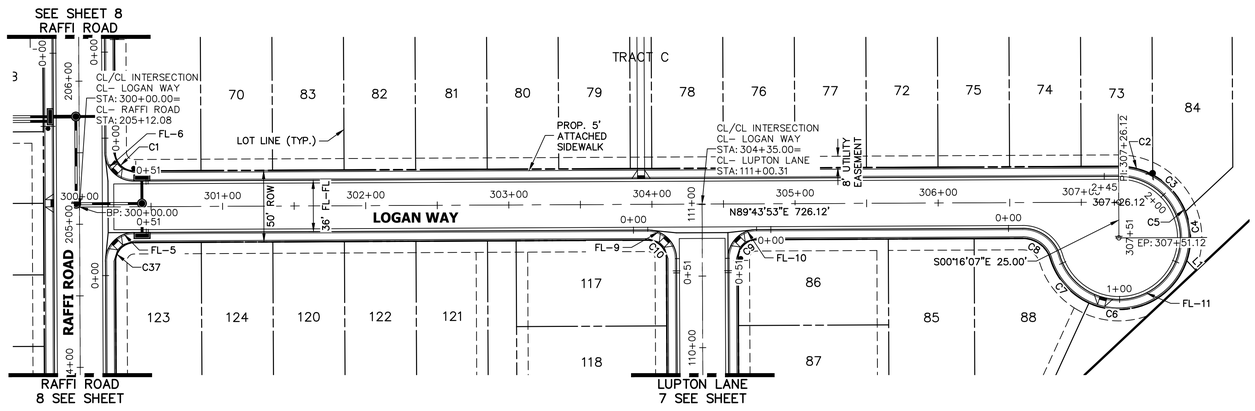
| | |
|---|---|
| H-SCALE | 1"=50' |
| V-SCALE | 1"=5' |
| DATE | 12/13/21 |
| DESIGNED BY | AJH |
| DRAWN BY | CRB |
| CHECKED BY | |

COYOTE CREEK FILING NO. 4

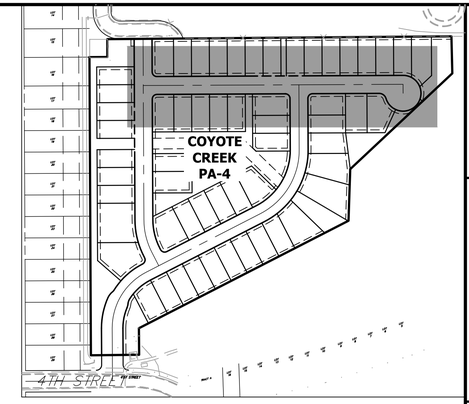
FINAL STREET PLAN AND PROFILE

SHEET 8 OF 46

JOB NO. 16093.00

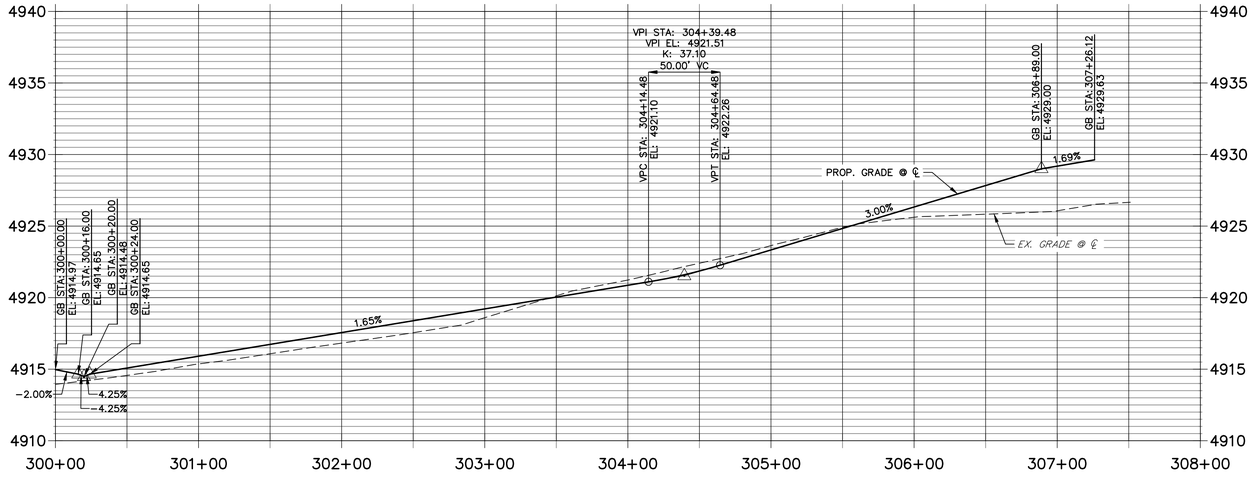



LOGAN WAY
STA. 300+00.00 TO 307+51.12

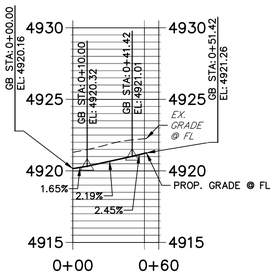



**KEY MAP**
N.T.S.

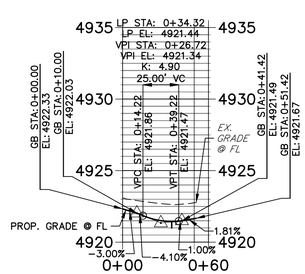
## CL- LOGAN WAY PROFILE
## STA 300+00.00 TO 308+00.00



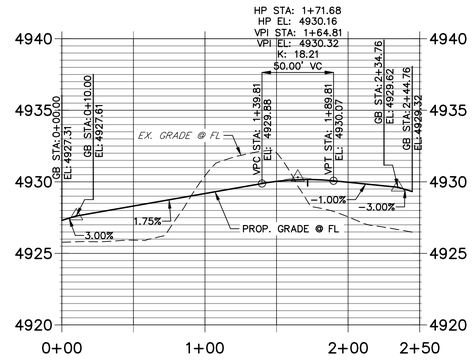

## FL-9 PROFILE
## STA 0+00.00 TO 0+60.00




## FL-10 PROFILE
## STA 0+00.00 TO 0+60.00



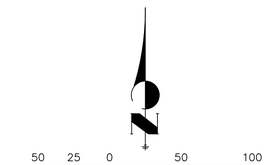

## FL-11 PROFILE
## STA 0+00.00 TO 2+50.00




| LINE TABLE | | |
|---|---|---|
| LINE | BEARING | DISTANCE |
| L1 | S43°09'42"E | 9.51' |
| L2 | N62°50'48"E | 1.17' |
| L3 | S62°50'48"W | 8.14' |
| L4 | S62°52'38"W | 0.16' |
| L5 | N62°50'48"E | 1.29' |
| L6 | N27°09'12"W | 4.67' |
| L7 | N27°09'12"W | 4.67' |
| L9 | N45°59'10"W | 13.12' |

| CURVE TABLE | | | | |
|---|---|---|---|---|
| CURVE | DELTA | RADIUS | LENGTH | CHORD |
| C1 | 90°00'00" | 13.00' | 20.42' | S45°16'07"E 18.38' |
| C2 | 28°31'44" | 50.00' | 24.90' | N76°00'15"W 24.64' |
| C3 | 40°06'33" | 50.00' | 35.00' | N41°41'07"W 34.29' |
| C4 | 40°06'33" | 50.00' | 35.00' | N01°34'34"W 34.29' |
| C5 | 253°23'54" | 50.00' | 221.13' | N36°25'51"E 80.18' |
| C8 | 73°23'54" | 20.00' | 25.62' | N53°34'09"W 23.90' |
| C9 | 90°00'00" | 13.00' | 20.42' | S44°43'53"W 18.38' |
| C10 | 90°00'00" | 13.00' | 20.42' | N45°16'07"W 18.38' |
| C11 | 1°10'19" | 175.00' | 3.58' | N00°19'03"E 3.58' |
| C12 | 2°46'17" | 225.00' | 10.88' | N01°07'02"E 10.88' |
| C13 | 13°56'57" | 225.00' | 54.78' | N09°28'39"E 54.64' |
| C14 | 38°23'55" | 175.00' | 117.28' | N20°06'10"E 115.10' |
| C15 | 63°06'55" | 175.00' | 192.77' | N31°17'21"E 183.17' |
| C17 | 63°06'55" | 225.00' | 247.85' | N31°17'21"E 235.51' |
| C18 | 13°58'29" | 225.00' | 54.88' | N23°26'23"E 54.74' |
| C19 | 8°00'31" | 225.00' | 31.45' | N34°25'53"E 31.42' |
| C20 | 13°41'21" | 225.00' | 53.76' | N45°16'49"E 53.63' |
| C21 | 23°32'40" | 175.00' | 71.91' | N51°04'28"E 71.41' |
| C22 | 10°43'19" | 225.00' | 42.10' | N57°29'09"E 42.04' |
| C23 | 23°30'43" | 150.00' | 61.55' | S51°05'27"W 61.12' |

| CURVE TABLE | | | | |
|---|---|---|---|---|
| CURVE | DELTA | RADIUS | LENGTH | CHORD |
| C24 | 29°55'48" | 150.00' | 78.36' | S47°52'54"W 77.47' |
| C25 | 6°25'05" | 150.00' | 16.80' | S36°07'33"W 16.79' |
| C26 | 27°40'04" | 32.00' | 15.45' | S19°04'59"W 15.30' |
| C27 | 17°37'16" | 36.00' | 11.07' | N14°03'35"E 11.03' |
| C28 | 23°08'19" | 145.00' | 58.56' | S11°18'03"W 58.16' |
| C29 | 24°48'28" | 205.00' | 88.76' | S12°08'07"W 88.07' |
| C30 | 27°59'58" | 42.00' | 20.52' | S38°32'20"W 20.32' |
| C31 | 20°50'59" | 15.00' | 5.46' | N42°06'50"E 5.43' |
| C32 | 9°23'19" | 200.00' | 32.77' | S36°22'59"W 32.74' |
| C34 | 31°09'28" | 200.00' | 108.76' | S47°16'04"W 107.43' |
| C35 | 21°46'10" | 200.00' | 75.99' | S51°57'44"W 75.53' |
| C36 | 90°00'00" | 13.00' | 20.42' | N17°50'48"E 18.38' |
| C37 | 90°00'00" | 13.00' | 20.42' | S44°43'53"W 18.38' |
| C37 | 90°00'00" | 13.00' | 20.42' | S72°09'12"E 18.38' |
| C38 | 26°53'05" | 175.00' | 82.11' | S13°42'39"E 81.36' |
| C40 | 10°34'57" | 225.00' | 41.56' | S21°51'43"E 41.50' |
| C41 | 26°53'05" | 225.00' | 105.58' | S13°42'39"E 104.61' |
| C42 | 15°29'53" | 225.00' | 60.86' | S08°49'19"E 60.67' |
| C43 | 0°48'16" | 225.00' | 3.16' | S00°40'14"E 3.16' |




Know what's **below.**
**Call** before you dig.

## ENGINEER'S STATEMENT

PREPARED UNDER MY DIRECT SUPERVISION

ANDREW J. HUGILL, PE
COLORADO LIC. PE NO. 57007
FOR AND ON BEHALF OF JR ENGINEERING, LLC.

DATE

UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, JR ENGINEERING APPROVES THEIR USE ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

PREPARED FOR
LUPTON LAND, LLC
10221 PRESTWICK TRAIL
LONE TREE, CO 80124
BOB QUINETTE
P-303.587.1966

J·R ENGINEERING
A Westrian Company
Centennial 303-740-9393 • Colorado Springs 719-593-2593
Fort Collins 970-491-9888 • www.jrengineering.com

| No. | REVISION | BY | DATE |
|---|---|---|---|
| | | | |

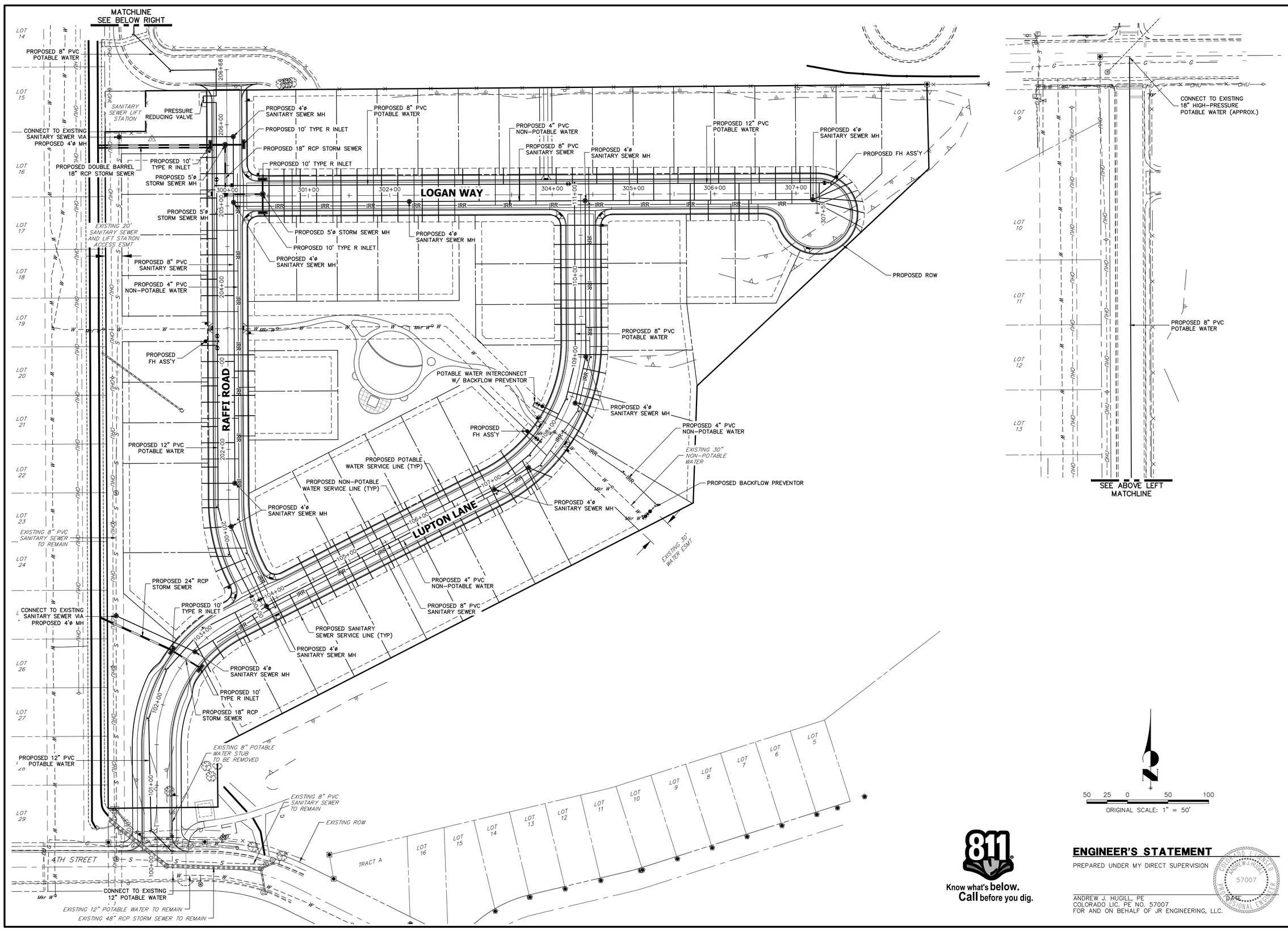
| | |
|---|---|
| H-SCALE | 1"=50' |
| V-SCALE | 1"=5' |
| DATE | 12/13/21 |
| DESIGNED BY | AJH |
| DRAWN BY | CRB |
| CHECKED BY | |

COYOTE CREEK FILING NO. 4

FINAL STREET PLAN AND PROFILE

SHEET 9 OF 46

JOB NO. 16093.00




UNTIL SUCH TIME AS THESE PLANS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, JR ENGINEERING APPROVES THEIR USE ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

PREPARED FOR
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10221 PRESTWICK TRAIL
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| No. | REVISION | BY | DATE |
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|---|---|---|---|
| H-SCALE | 1"=50' | DESIGNED BY | SWW |
| V-SCALE | N/A | DRAWN BY | SWW |
| DATE | 12/13/21 | CHECKED BY | |

COYOTE CREEK FILING NO. 4

FINAL UTILITY PLAN

Know what's below. Call before you dig.

## ENGINEER'S STATEMENT

PREPARED UNDER MY DIRECT SUPERVISION

ANDREW J. HUGILL, PE
COLORADO LIC. PE NO. 57007
FOR AND ON BEHALF OF JR ENGINEERING, LLC.

COLORADO LICENSED ANDREW J. HUGILL 57007 PROFESSIONAL ENGINEER

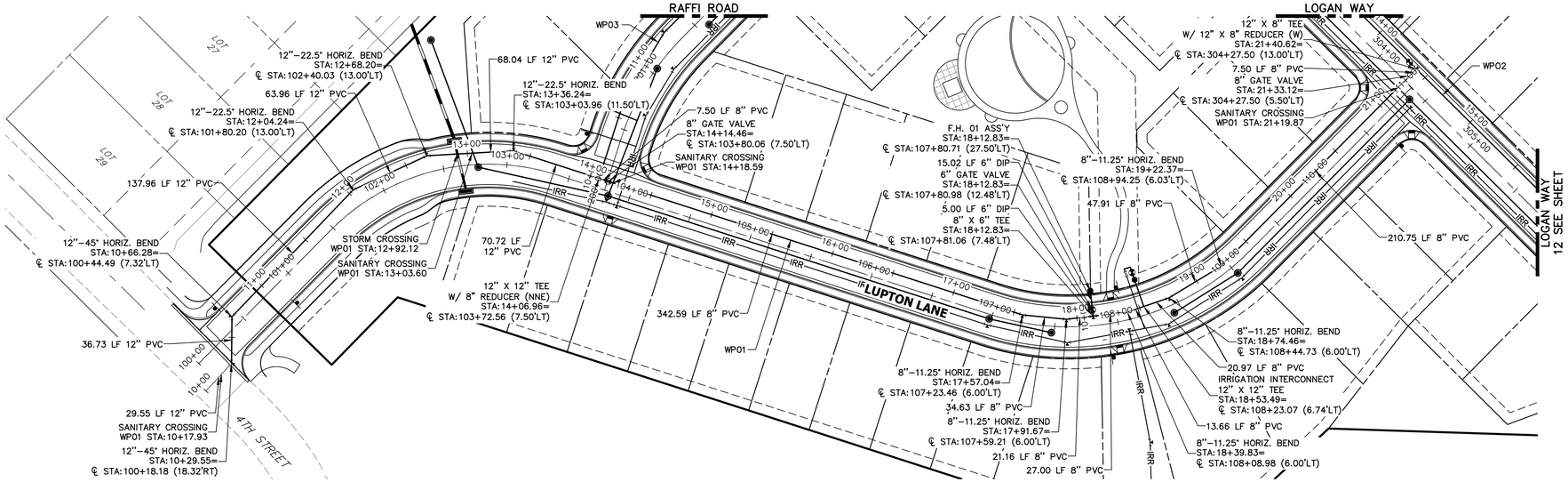
DATE

SHEET 10 OF 46

JOB NO. 16093.00

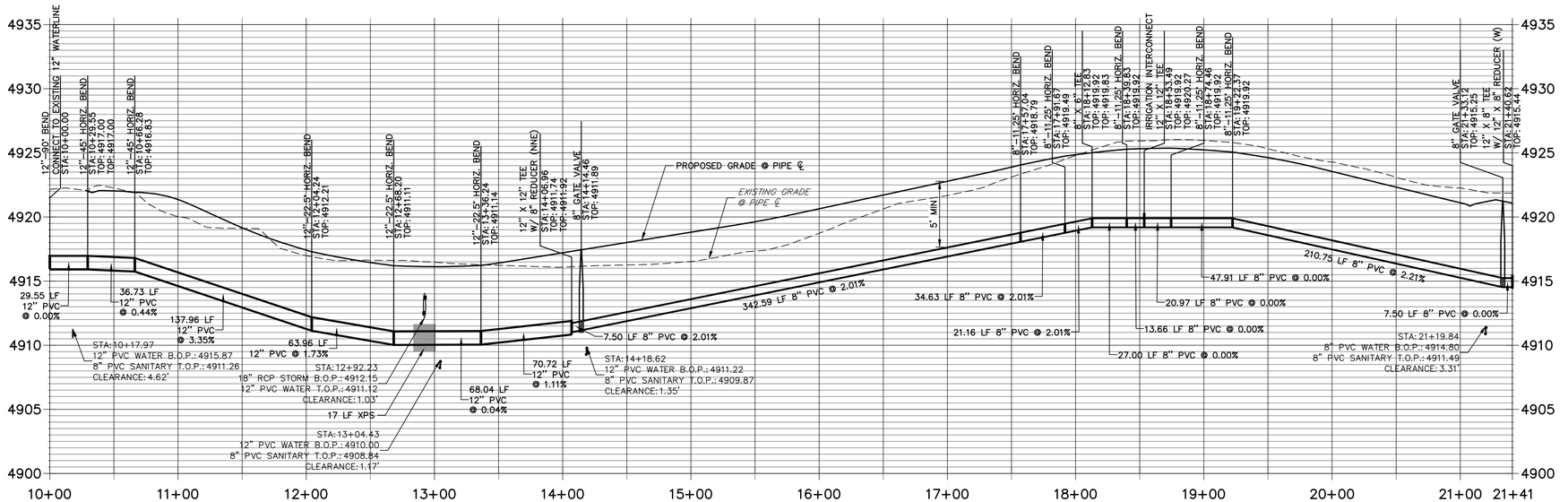
## NOTES:

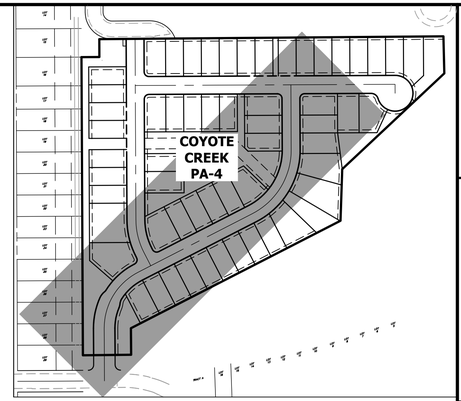
1. ALL STATIONING IS PIPE CENTERLINE EQUATED TO ROADWAY CENTERLINE, UNLESS OTHERWISE NOTED.

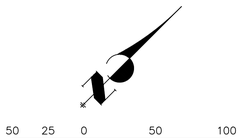



LUPTON LANE
STA. 100+00.00 TO 111+00.31

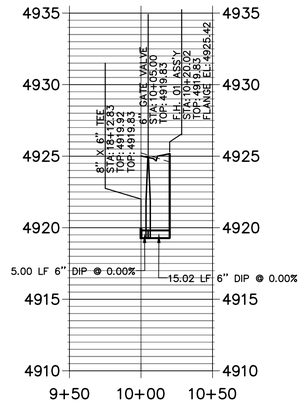
## WP01 PROFILE
## STA 10+00.00 TO 21+40.62




## FH01 PROFILE
## STA 9+50.00 TO 10+50.00




Know what's below.
Call before you dig.

## ENGINEER'S STATEMENT

PREPARED UNDER MY DIRECT SUPERVISION

COLORADO LICENSED
ANDREW J. HUGILL
57007
PROFESSIONAL ENGINEER

ANDREW J. HUGILL, PE
COLORADO LIC. PE NO. 57007
FOR AND ON BEHALF OF JR ENGINEERING, LLC.

DATE

UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, JR ENGINEERING APPROVES THEIR USE ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

PREPARED FOR
LUPTON LAND, LLC
10221 PRESTWICK TRAIL
LONE TREE, CO 80124
BOB QUINETTE
P-303.587.1966

J·R ENGINEERING
A Westrian Company
Centennial 303-740-9393 • Colorado Springs 719-593-2593
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| No. | REVISION | BY | DATE |
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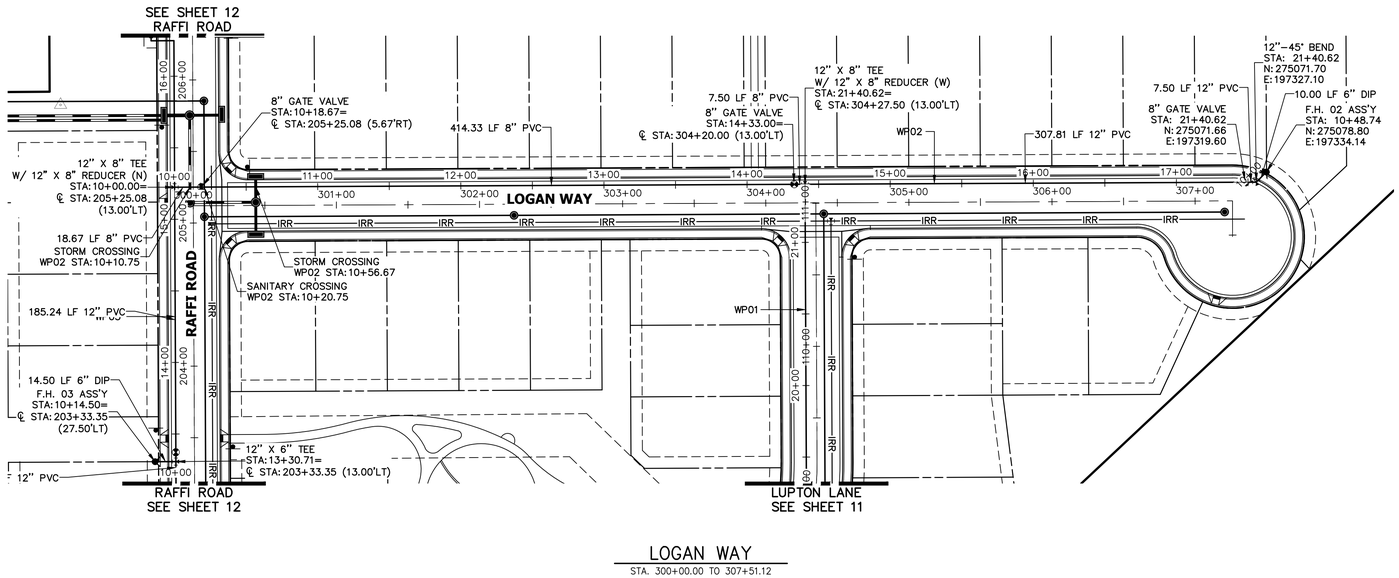
| | | | |
|---|---|---|---|
| H-SCALE | 1"=50' | DESIGNED BY | SWW |
| V-SCALE | 1"=5' | DRAWN BY | SWW |
| DATE | 12/13/21 | CHECKED BY | |

COYOTE CREEK FILING NO 4

WATER PLAN & PROFILE

SHEET 11 OF 46

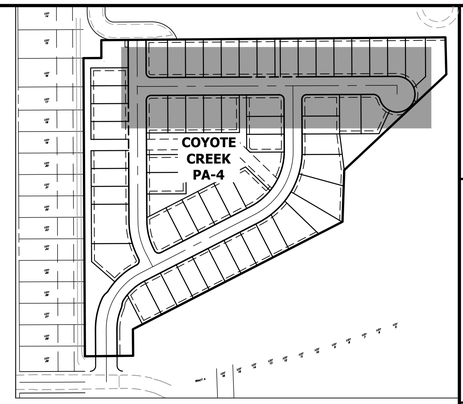
JOB NO. 16093.00

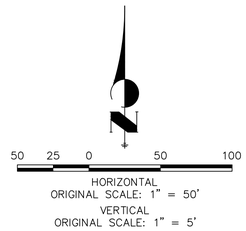



LOGAN WAY
STA. 300+00.00 TO 307+51.12

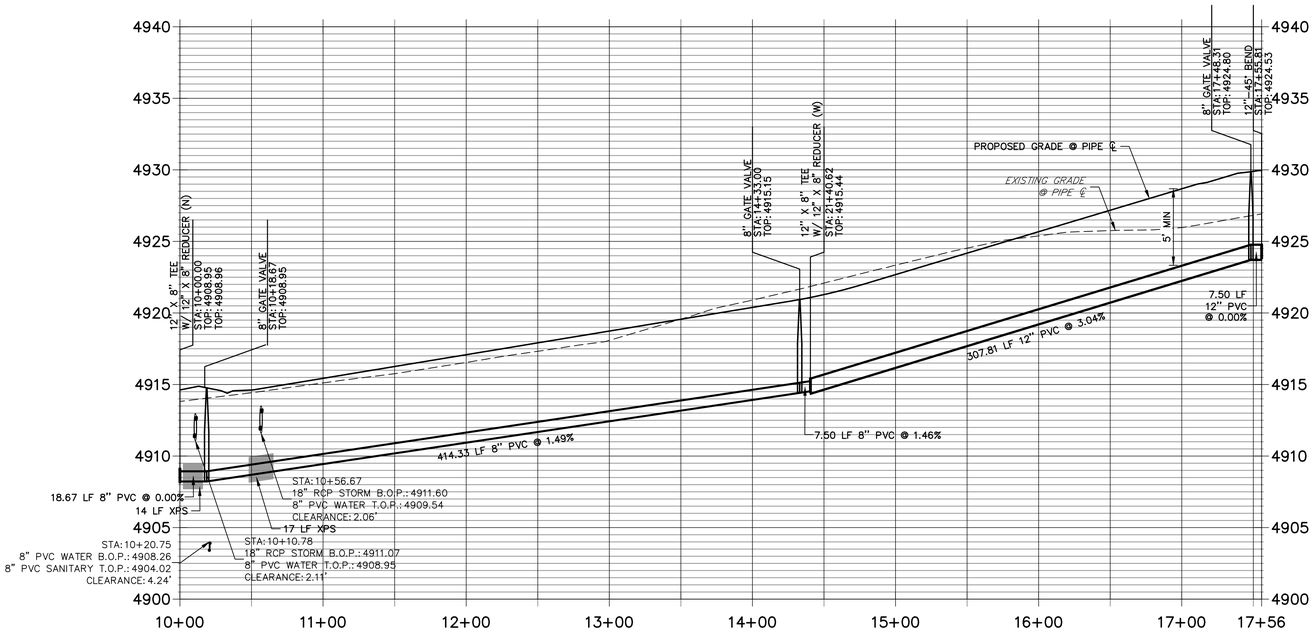
## NOTES:

1. ALL STATIONING IS PIPE CENTERLINE EQUATED TO ROADWAY CENTERLINE, UNLESS OTHERWISE NOTED.

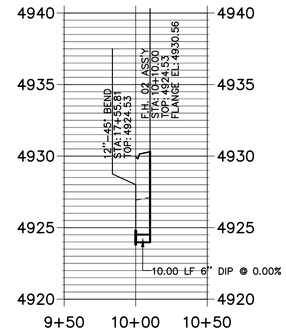


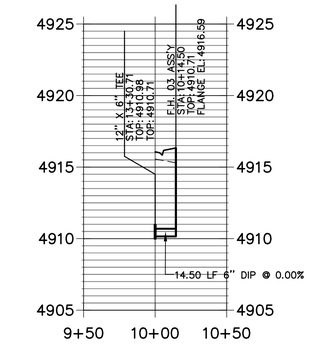

## WP02 PROFILE
## STA 10+00.00 TO 17+55.81




## FH02 PROFILE
## STA 9+50.00 TO 10+50.00




## FH03 PROFILE
## STA 9+50.00 TO 10+50.00

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## ENGINEER'S STATEMENT

PREPARED UNDER MY DIRECT SUPERVISION

ANDREW J. HUGILL, PE
COLORADO LIC. PE NO. 57007
FOR AND ON BEHALF OF JR ENGINEERING, LLC.

DATE:

UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, JR ENGINEERING APPROVES THEIR USE ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

PREPARED FOR
LUPTON LAND, LLC
10221 PRESTWICK TRAIL
LONE TREE, CO 80124
BOB QUINETTE
P-303.587.1966

J·R ENGINEERING
A Westrian Company
Centennial 303-740-9393 • Colorado Springs 719-593-2593
Fort Collins 970-491-9888 • www.jrengineering.com

| No. | REVISION | BY | DATE |
|---|---|---|---|
| | | | |

| | |
|---|---|
| H-SCALE | 1"=50' |
| V-SCALE | 1"=5' |
| DATE | 12/13/21 |
| DESIGNED BY | SWW |
| DRAWN BY | SWW |
| CHECKED BY | |

COYOTE CREEK FILING NO 4

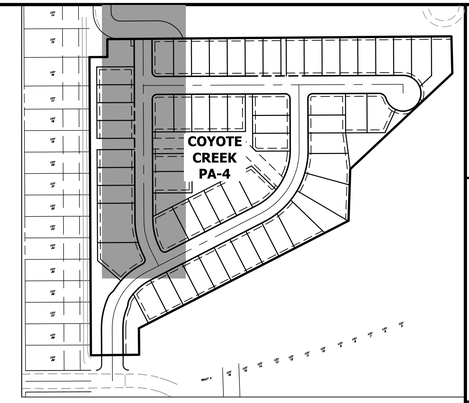
WATER PLAN & PROFILE

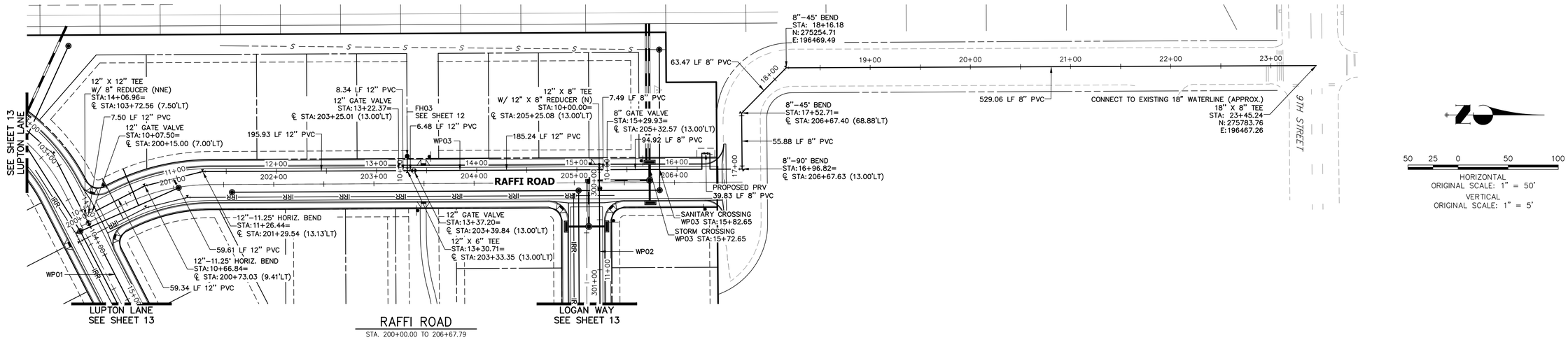
SHEET 12 OF 46

JOB NO. 16093.00

## NOTES:

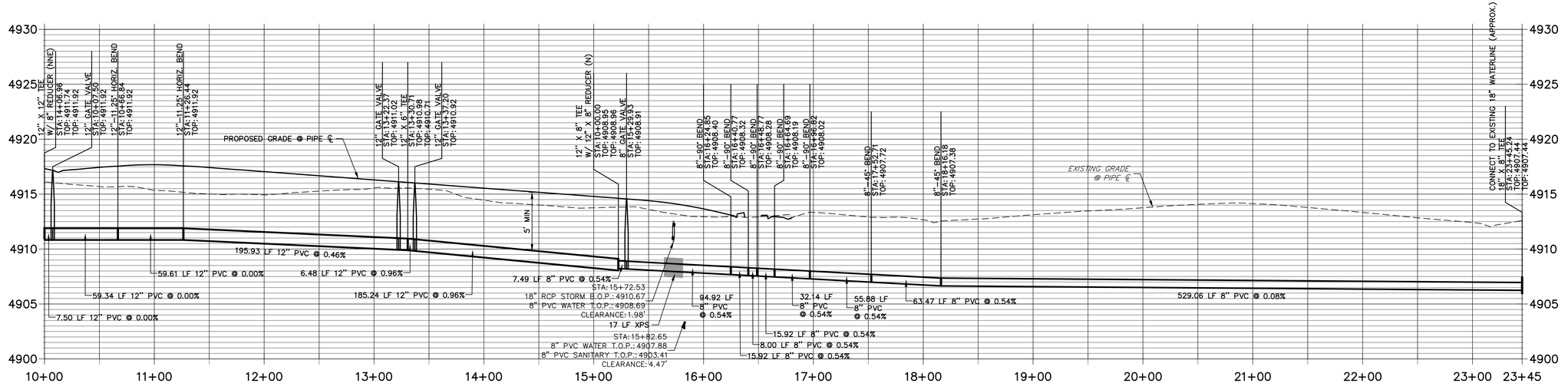
1. ALL STATIONING IS PIPE CENTERLINE EQUATED TO ROADWAY CENTERLINE, UNLESS OTHERWISE NOTED.




RAFFI ROAD
STA. 200+00.00 TO 206+67.79

## WP03 PROFILE
## STA 10+00.00 TO 23+45.24




811 Know what's below. Call before you dig.

## ENGINEER'S STATEMENT

PREPARED UNDER MY DIRECT SUPERVISION

ANDREW J. HUGILL, PE
COLORADO LIC. PE NO. 57007
FOR AND ON BEHALF OF JR ENGINEERING, LLC.

COLORADO LICENSED ANDREW J. HUGILL 57007 PROFESSIONAL ENGINEER

UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, JR ENGINEERING APPROVES THEIR USE ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

PREPARED FOR
LUPTON LAND, LLC
10221 PRESTWICK TRAIL
LONE TREE, CO 80124
BOB QUINETTE
P-303.587.1966

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| No. | REVISION | BY | DATE |
|---|---|---|---|
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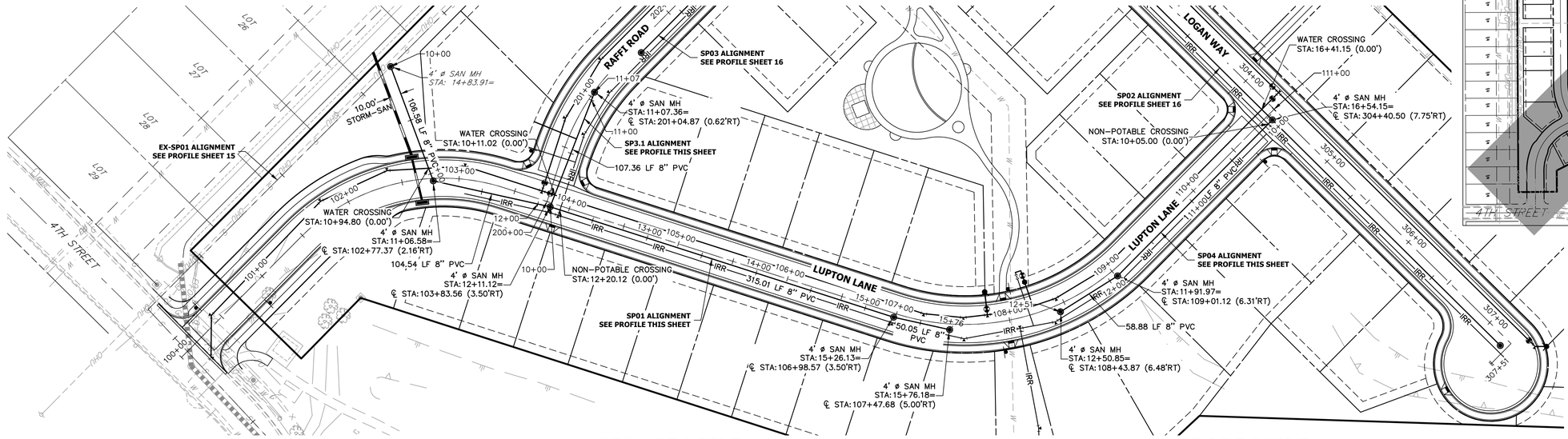
H-SCALE 1"=50'
V-SCALE 1"=5'
DATE 12/13/21
DESIGNED BY SWW
DRAWN BY SWW
CHECKED BY

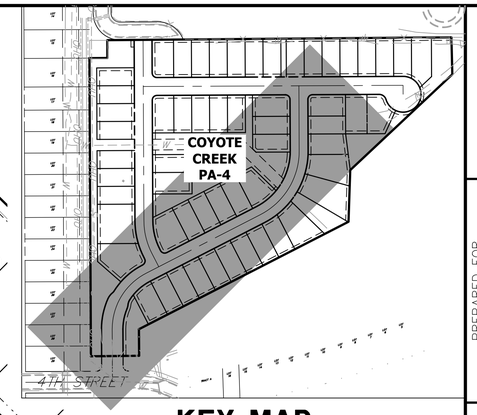
COYOTE CREEK FILING NO 4

WATER PLAN & PROFILE

SHEET 13 OF 46

JOB NO. 16093.00



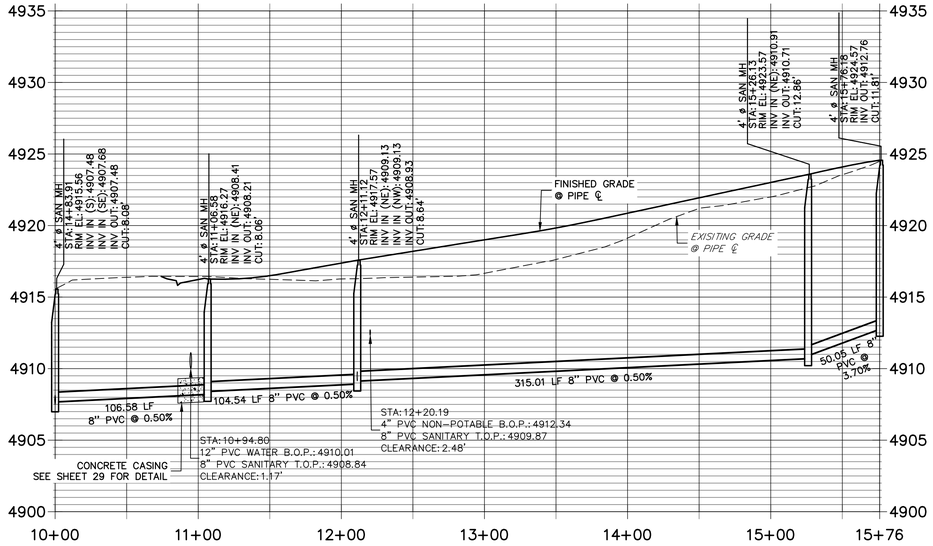

## KEY MAP

N.T.S.

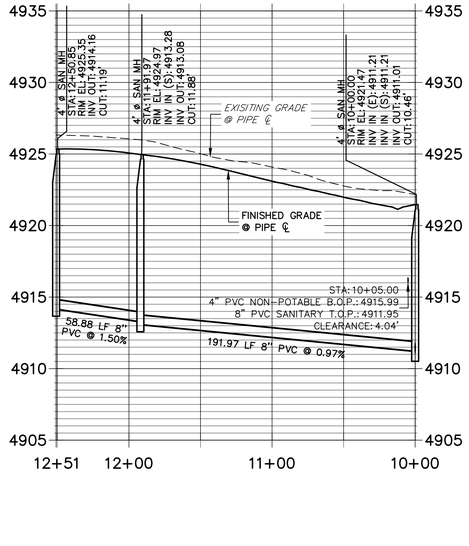
50 25 0 50 100

HORIZONTAL
ORIGINAL SCALE: 1" = 50'
VERTICAL
ORIGINAL SCALE: 1" = 5'

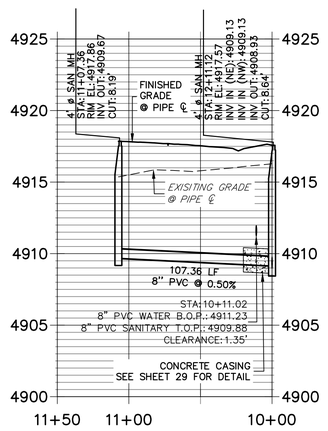
## SP01 PROFILE
## STA 10+00.00 TO 15+76.18




## SP04 PROFILE
## STA 10+00.00 TO 12+50.85




## SP3.1 PROFILE
## STA 10+00.00 TO 11+50.00




**811** Know what's **below.** **Call** before you dig.

### BASIS OF BEARING:

THE WEST LINE OF THE NORTHEAST QUARTER OF SECTION 5, TOWNSHIP 1 NORTH, RANGE 66 WEST OF THE 6TH PRINCIPAL MERIDIAN, BEING MONUMENTED AT THE NORTH END BY A 3-1/4" ALUMINUM CAP STAMPED "1/4 2003 PLS 14823" IN A RANGE BOX AND AT THE SOUTH END BY A #6 REBAR WITH 3-1/4" ALUMINUM CAP STAMP ILLEGIBLE OFF TO THE SIDE IN A RANGE BOX, BEARING N00°16'07"W AS REFERENCED TO COLORADO STATE PLANE NORTH ZONE.

### BENCHMARK:

WELD COUNTY BENCHMARK 4907, 3-3/4" PIPE CAP ON PIPE APPROXIMATELY 90 FEET WEST OF THE WESTERLY MOST RAILROAD TRACK AND 26 FEET SOUTH OF THE CENTERLINE OF 9TH STREET, ELEVATION=4908.22 (NAVD88)

### ENGINEER'S STATEMENT

PREPARED UNDER MY DIRECT SUPERVISION

COLORADO REGISTERED ANDREW J. HUGILL 57007 PROFESSIONAL ENGINEER

ANDREW J. HUGILL, PE
COLORADO LIC. PE NO. 57007
FOR AND ON BEHALF OF JR ENGINEERING, LLC.

DATE

UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, JR ENGINEERING APPROVES THEIR USE ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

PREPARED FOR
LUPTON LAND, LLC
10221 PRESTWICK TRAIL
LONE TREE, CO 80124
BOB QUINETTE
P-303.587.1966

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Centennial 303-740-9393 • Colorado Springs 719-593-2593
Fort Collins 970-491-9888 • www.jrengineering.com

| No. | REVISION | BY | DATE |
|---|---|---|---|
| | | | |

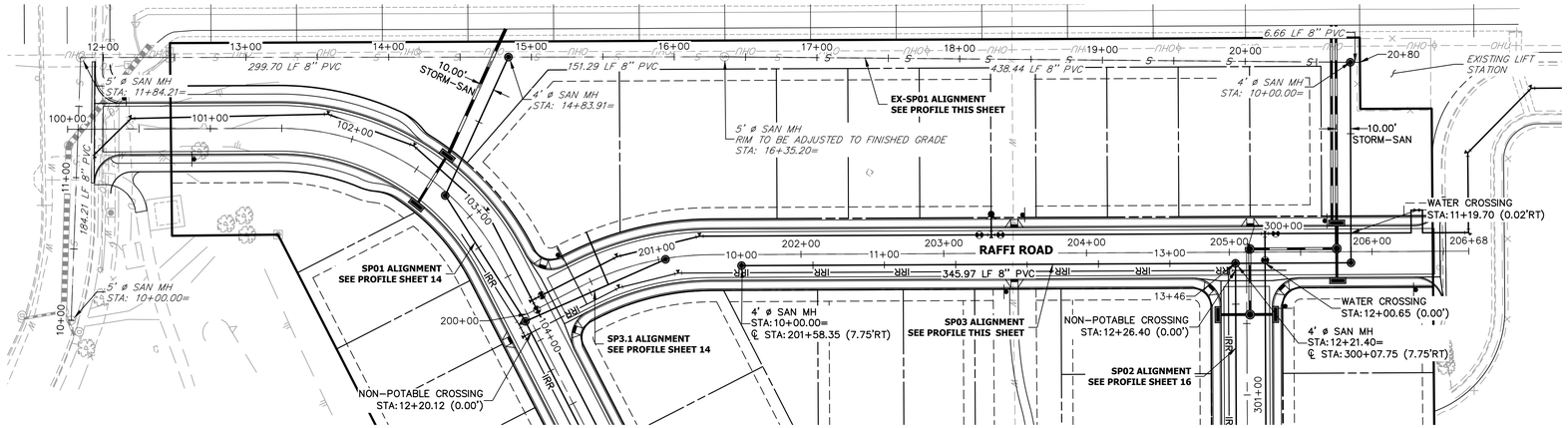
| | |
|---|---|
| H-SCALE | 1"=50' |
| V-SCALE | 1"=5' |
| DATE | 12/13/21 |
| DESIGNED BY | AHC |
| DRAWN BY | AHC |
| CHECKED BY | |

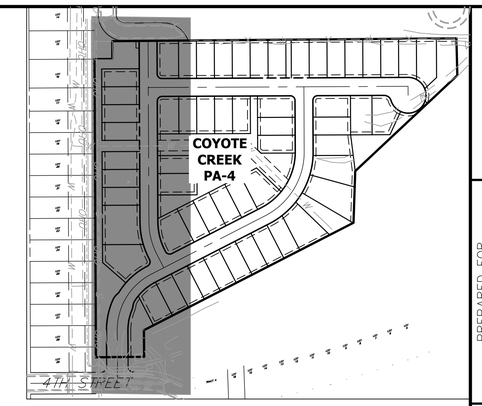
COYOTE CREEK FILING NO 4

SANITARY SEWER PLAN & PROFILE

SHEET 14 OF 46

JOB NO. 16093.00

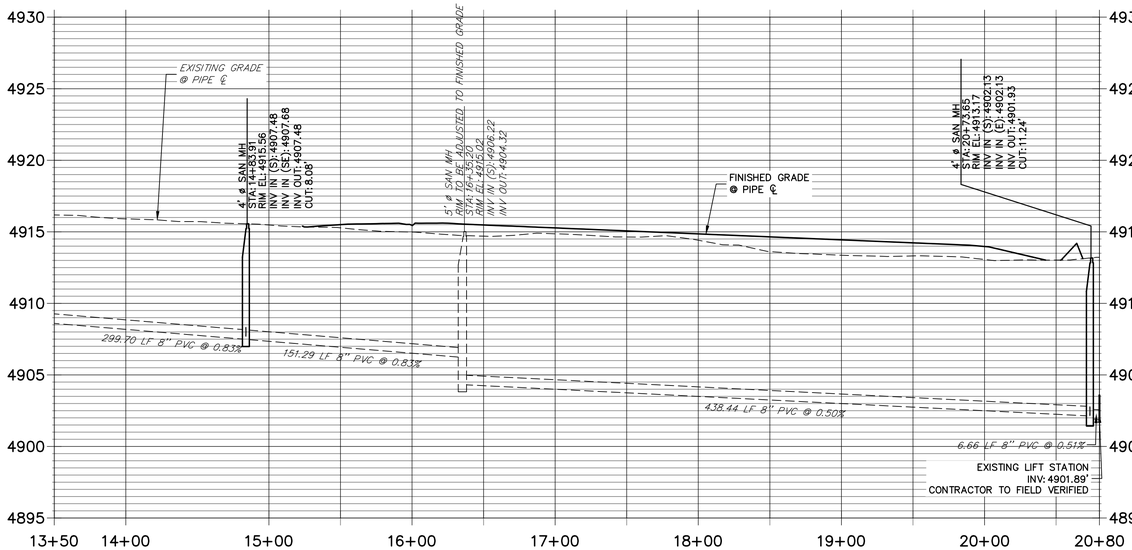


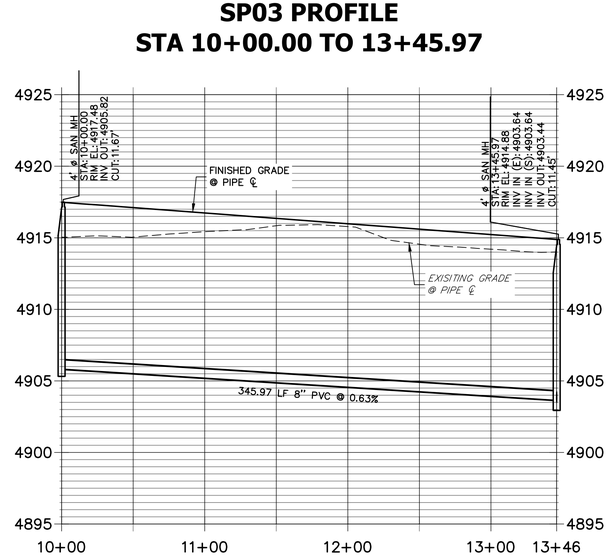

## KEY MAP
N.T.S.

50 25 0 50 100
HORIZONTAL ORIGINAL SCALE: 1" = 50'
VERTICAL ORIGINAL SCALE: 1" = 5'

## EX-SP01 PROFILE
## STA 13+50.00 TO 20+80.31




## SP03 PROFILE
## STA 10+00.00 TO 13+45.97




Know what's below. Call before you dig.

## BASIS OF BEARING:
THE WEST LINE OF THE NORTHEAST QUARTER OF SECTION 5, TOWNSHIP 1 NORTH, RANGE 66 WEST OF THE 6TH PRINCIPAL MERIDIAN, BEING MONUMENTED AT THE NORTH END BY A 3-1/4" ALUMINUM CAP STAMPED "1/4 2003 PLS 14823" IN A RANGE BOX AND AT THE SOUTH END BY A #6 REBAR WITH 3-1/4" ALUMINUM CAP STAMP ILLEGIBLE OFF TO THE SIDE IN A RANGE BOX, BEARING N00°16'07"W AS REFERENCED TO COLORADO STATE PLANE NORTH ZONE.

## BENCHMARK:
WELD COUNTY BENCHMARK 4907, 3-3/4" PIPE CAP ON PIPE APPROXIMATELY 90 FEET WEST OF THE WESTERLY MOST RAILROAD TRACK AND 26 FEET SOUTH OF THE CENTERLINE OF 9TH STREET, ELEVATION=4908.22 (NAVD88)

## ENGINEER'S STATEMENT
PREPARED UNDER MY DIRECT SUPERVISION

ANDREW J. HUGILL, PE
COLORADO LIC. PE NO. 57007
FOR AND ON BEHALF OF JR ENGINEERING, LLC.

DATE

ANDREW J. HUGILL 57007 REGISTERED PROFESSIONAL ENGINEER

UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, JR ENGINEERING APPROVES THEIR USE ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

PREPARED FOR
LUPTON LAND, LLC
10221 PRESTWICK TRAIL
LONE TREE, CO 80124
BOB QUINETTE
P-303.587.1966

J·R ENGINEERING
A Westrian Company
Centennial 303-740-9393 • Colorado Springs 719-593-2593
Fort Collins 970-491-9888 • www.jrengineering.com

| No. | REVISION | BY | DATE |
|---|---|---|---|
| | | | |

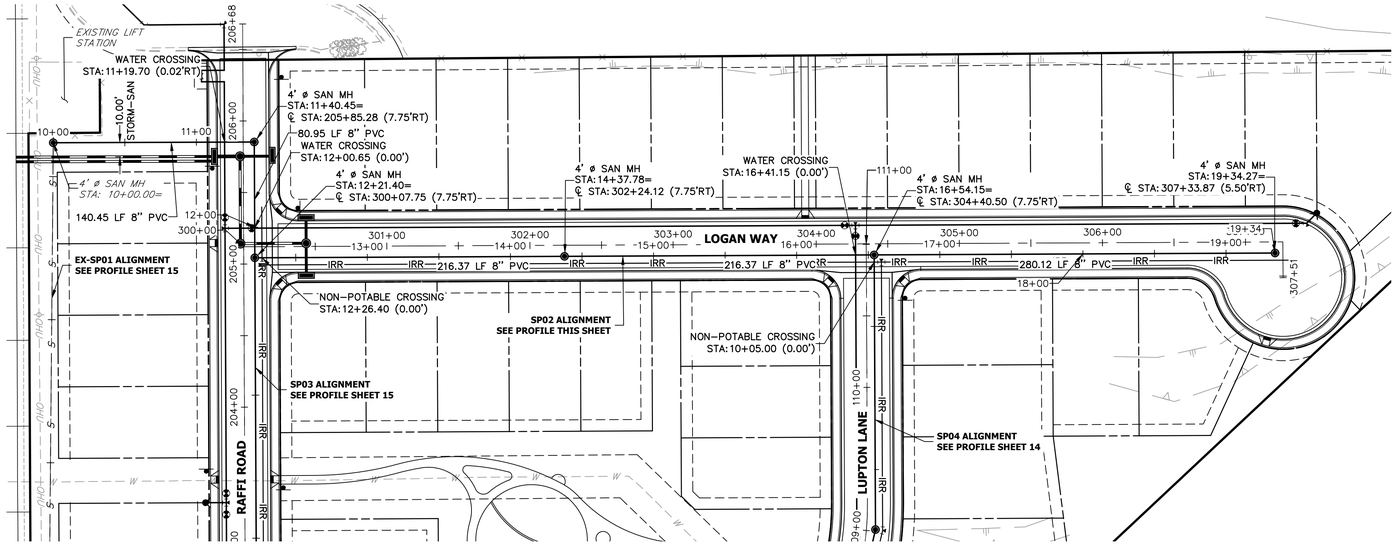
| | |
|---|---|
| H-SCALE | 1"=50' |
| V-SCALE | 1"=5' |
| DATE | 12/13/21 |
| DESIGNED BY | AHC |
| DRAWN BY | AHC |
| CHECKED BY | |

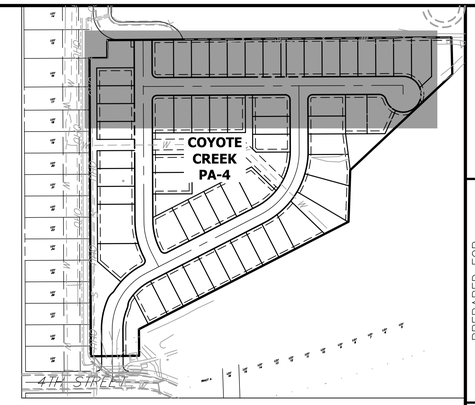
COYOTE CREEK FILING NO 4

SANITARY SEWER PLAN & PROFILE

SHEET 15 OF 46

JOB NO. 16093.00



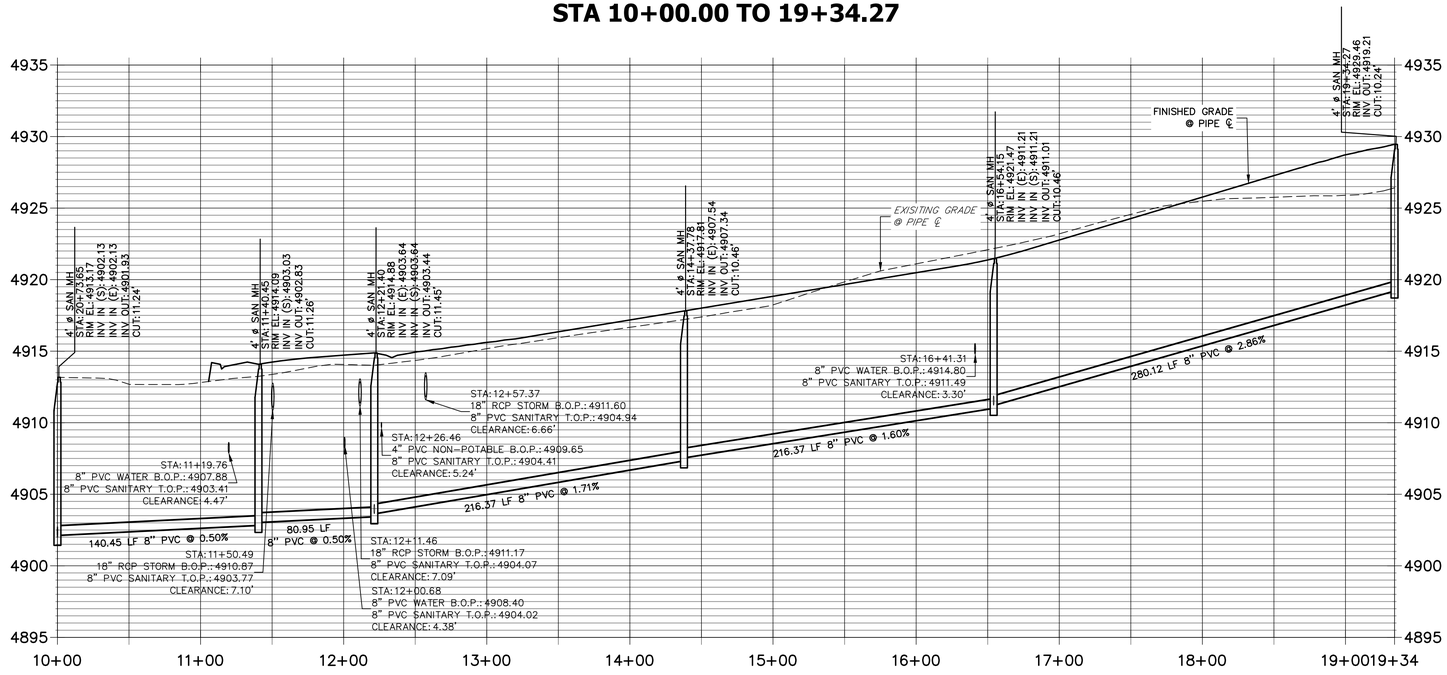

## KEY MAP

N.T.S.

50 25 0 50 100

HORIZONTAL
ORIGINAL SCALE: 1" = 50'
VERTICAL
ORIGINAL SCALE: 1" = 5'

## SP02 PROFILE
## STA 10+00.00 TO 19+34.27

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COLORADO REGISTERED ANDREW J. HUGILL 57007 PROFESSIONAL ENGINEER

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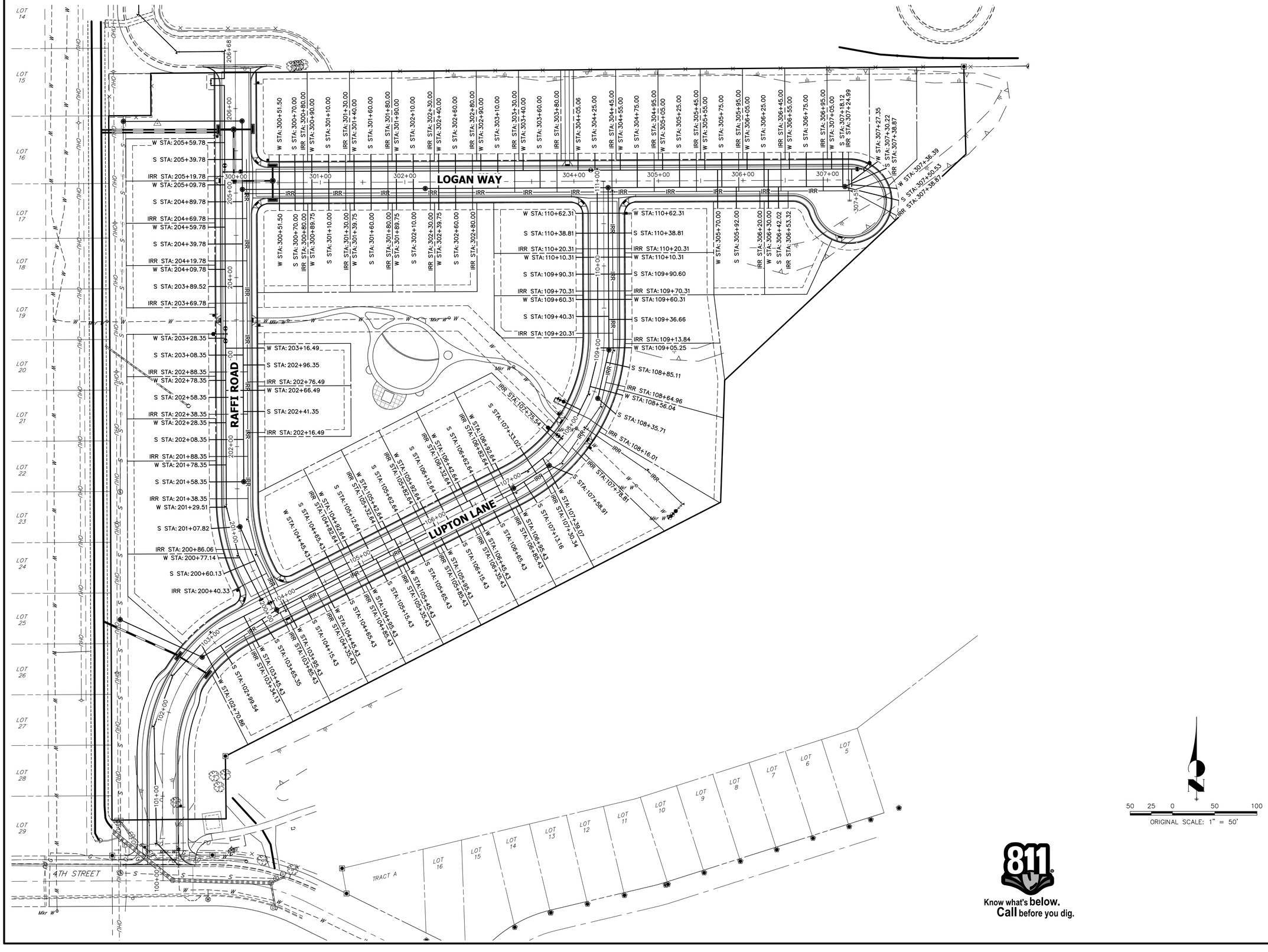
| V-SCALE | 1"=5' |
| DATE | 12/13/21 |
| DESIGNED BY | AHC |
| DRAWN BY | AHC |
| CHECKED BY | |

COYOTE CREEK FILING NO 4

SANITARY SEWER PLAN & PROFILE

SHEET 16 OF 46

JOB NO. 16093.00


LOGAN WAY
RAFFI ROAD
LUPTON LANE
4TH STREET
TRACT A
LOT 14
LOT 15
LOT 16
LOT 17
LOT 18
LOT 19
LOT 20
LOT 21
LOT 22
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111+00
110+00
109+00
108+00
107+00
106+00
105+00
104+00
103+00
102+00
101+00
100+00
W STA: 205+59.78
S STA: 205+39.78
IRR STA: 205+19.78
W STA: 205+09.78
S STA: 204+89.78
IRR STA: 204+69.78
W STA: 204+59.78
S STA: 204+39.78
IRR STA: 204+19.78
W STA: 204+09.78
S STA: 203+89.52
IRR STA: 203+69.78
W STA: 203+28.35
S STA: 203+08.35
IRR STA: 202+88.35
W STA: 202+78.35
S STA: 202+58.35
IRR STA: 202+38.35
W STA: 202+28.35
S STA: 202+08.35
IRR STA: 201+88.35
W STA: 201+78.35
S STA: 201+58.35
IRR STA: 201+38.35
W STA: 201+29.51
S STA: 201+07.82
IRR STA: 200+86.06
W STA: 200+77.14
S STA: 200+60.13
IRR STA: 200+40.33
W STA: 300+51.50
S STA: 300+70.00
IRR STA: 300+80.00
W STA: 300+90.00
S STA: 301+10.00
IRR STA: 301+30.00
W STA: 301+40.00
S STA: 301+60.00
IRR STA: 301+80.00
W STA: 301+90.00
S STA: 302+10.00
IRR STA: 302+30.00
W STA: 302+40.00
S STA: 302+60.00
IRR STA: 302+80.00
W STA: 302+90.00
S STA: 303+10.00
IRR STA: 303+30.00
W STA: 303+40.00
S STA: 303+60.00
IRR STA: 303+80.00
W STA: 304+05.06
S STA: 304+25.00
IRR STA: 304+45.00
W STA: 304+55.00
S STA: 304+75.00
IRR STA: 304+95.00
W STA: 305+05.00
S STA: 305+25.00
IRR STA: 305+45.00
W STA: 305+55.00
S STA: 305+75.00
IRR STA: 305+95.00
W STA: 306+05.00
S STA: 306+25.00
IRR STA: 306+45.00
W STA: 306+55.00
S STA: 306+75.00
IRR STA: 306+95.00
W STA: 307+05.00
S STA: 307+18.12
IRR STA: 307+24.99
W STA: 307+27.35
S STA: 307+30.22
IRR STA: 307+38.87
W STA: 307+36.39
S STA: 307+50.53
IRR STA: 307+58.87
W STA: 110+62.31
S STA: 110+38.81
IRR STA: 110+20.31
W STA: 110+10.31
S STA: 109+90.31
IRR STA: 109+70.31
W STA: 109+60.31
S STA: 109+40.31
IRR STA: 109+20.31
W STA: 109+05.25
S STA: 109+36.66
IRR STA: 109+13.84
S STA: 108+85.11
IRR STA: 108+64.96
W STA: 108+56.04
S STA: 108+35.71
IRR STA: 108+16.01
S STA: 107+58.91
IRR STA: 107+78.81
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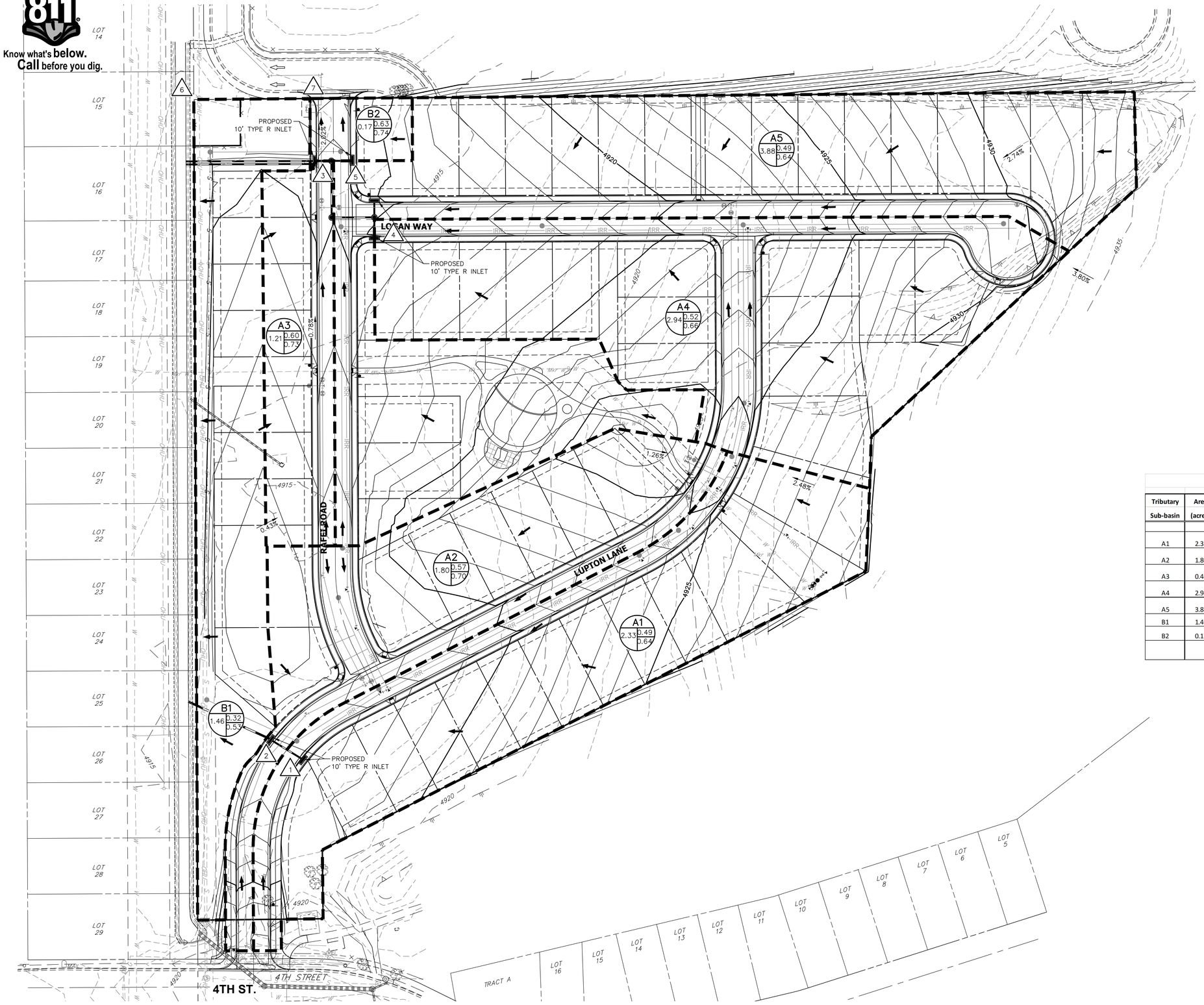
S STA: 106+75.43
IRR STA: 106+55.43
W STA: 106+45.43
S STA: 106+15.43
IRR STA: 105+95.43
W STA: 105+85.43
S STA: 105+65.43
IRR STA: 105+45.43
W STA: 105+35.43
S STA: 105+15.43
IRR STA: 104+95.43
W STA: 104+85.43
S STA: 104+65.43
IRR STA: 104+45.43
W STA: 104+35.43
S STA: 104+15.43
IRR STA: 103+95.43
W STA: 103+85.43
S STA: 103+65.35
IRR STA: 103+34.13
W STA: 102+99.54
S STA: 102+70.86
IRR STA: 107+75.54
W STA: 106+92.64
S STA: 106+82.64
IRR STA: 106+62.64
W STA: 106+42.64
S STA: 106+12.64
IRR STA: 105+92.64
W STA: 105+82.64
S STA: 105+62.64
IRR STA: 105+42.64
W STA: 105+32.64
S STA: 105+12.64
IRR STA: 104+92.64
W STA: 104+82.64
S STA: 104+65.43
IRR STA: 104+45.43
W STA: 203+16.49
S STA: 202+96.35
IRR STA: 202+76.49
W STA: 202+66.49
S STA: 202+41.35
IRR STA: 202+16.49
206+68
206+00
207+00
Mkr W
Mkr X
Mkr O
Mkr S
Mkr W
Mkr W
Mkr W

# COYOTE CREEK FILING NO. 4

Know what's below. Call before you dig.




**BASIN SUMMARY TABLE**

| Tributary Sub-basin | Area (acres) | Percent Impervious | $C_5$ | $C_{100}$ | $t_c$ (min) | $Q_5$ (cfs) | $Q_{100}$ (cfs) |
|---|---|---|---|---|---|---|---|
| A1 | 2.33 | 52% | 0.49 | 0.64 | 13.0 | 3.9 | 9.8 |
| A2 | 1.80 | 62% | 0.57 | 0.70 | 11.4 | 3.8 | 8.8 |
| A3 | 0.48 | 64% | 0.60 | 0.73 | 9.7 | 1.1 | 2.6 |
| A4 | 2.94 | 56% | 0.52 | 0.66 | 11.1 | 5.7 | 13.8 |
| A5 | 3.88 | 51% | 0.49 | 0.64 | 13.7 | 6.4 | 16.1 |
| B1 | 1.46 | 29% | 0.32 | 0.53 | 13.8 | 1.6 | 5.0 |
| B2 | 0.17 | 69% | 0.63 | 0.74 | 5.0 | 0.5 | 1.2 |

N

50 25 0 50 100

ORIGINAL SCALE: 1" = 50'

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PREPARED FOR
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LONE TREE, CO 80124
BOB QUINETTE
P-303.587.1966


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| No. | REVISION | BY | DATE |
|---|---|---|---|
| | | | |

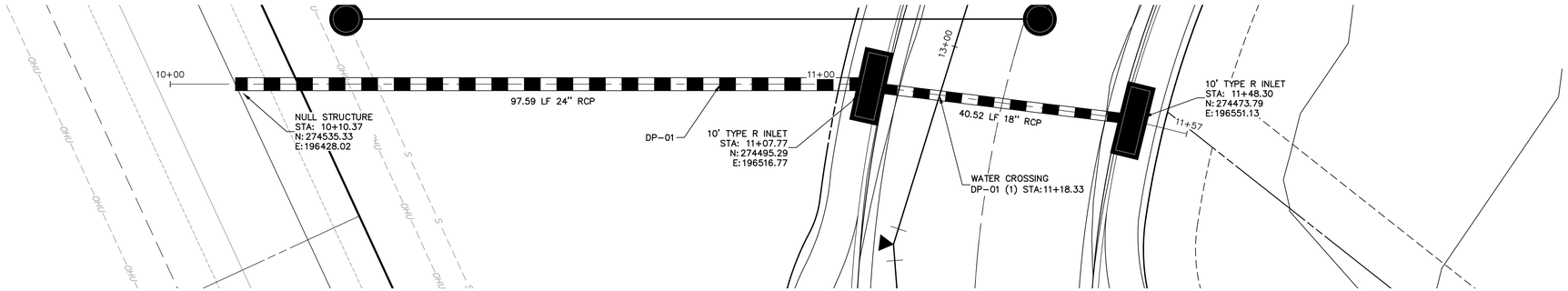
| | |
|---|---|
| H-SCALE | 1"=50' |
| V-SCALE | 1"=X' |
| DATE | 12/13/21 |
| DESIGNED BY | AJH |
| DRAWN BY | XXX |
| CHECKED BY | |

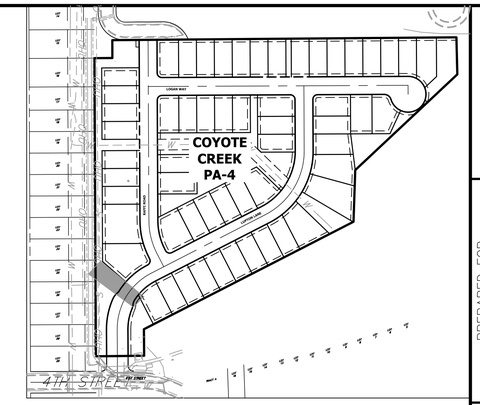
COYOTE CREEK FILING NO. 4

FINAL DRAINAGE PLAN

SHEET 18 OF 27

JOB NO. 16093.00

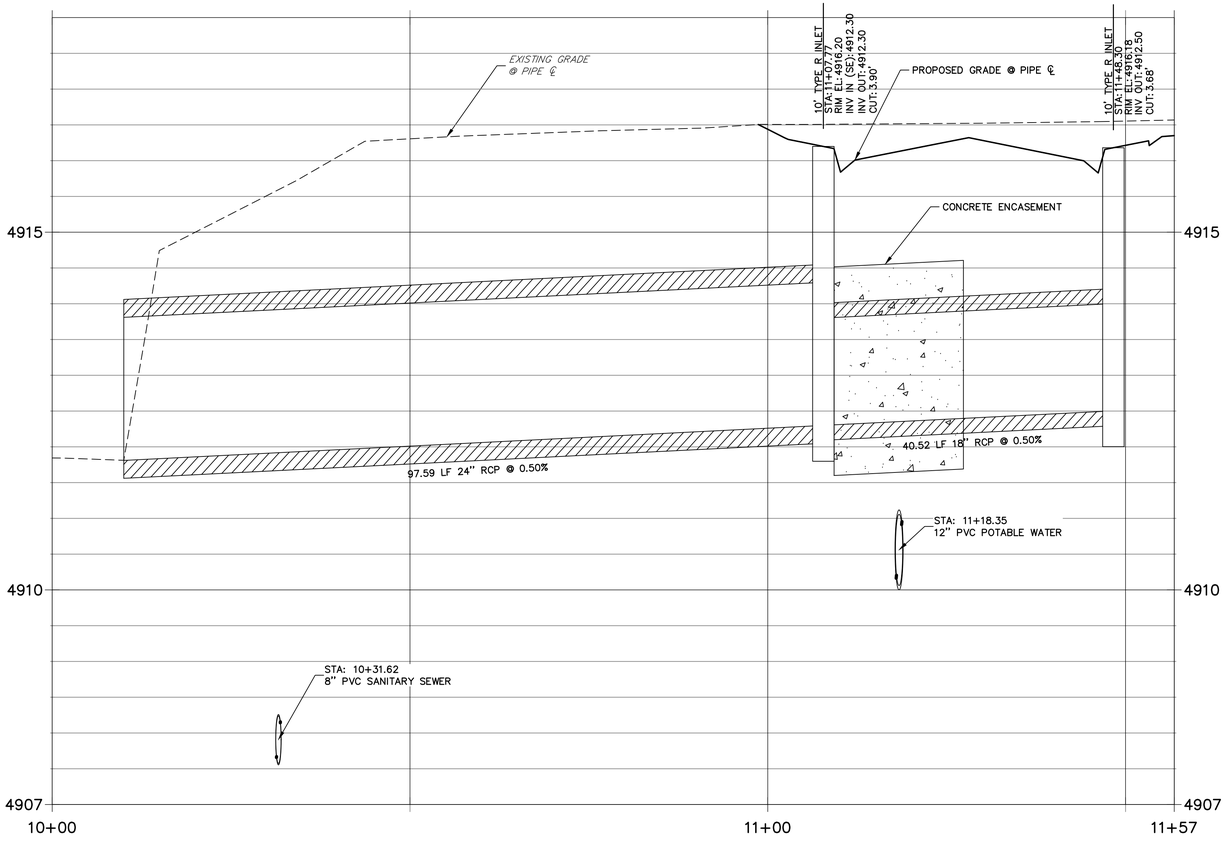



**KEY MAP**
N.T.S.

50 25 0 50 100
HORIZONTAL
ORIGINAL SCALE: 1" = 50'
VERTICAL
ORIGINAL SCALE: 1" = 5'

## DP-01 PROFILE
## STA 10+00.00 TO 11+56.80

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| | | | |

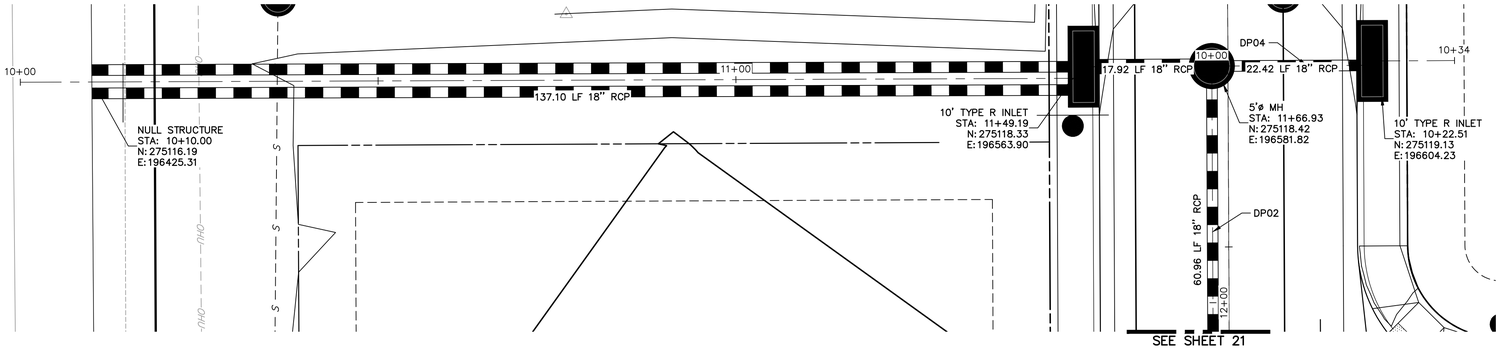
| | |
|---|---|
| H-SCALE | 1"=50' |
| V-SCALE | 1"=5' |
| DATE | 12/13/21 |
| DESIGNED BY | AJH |
| DRAWN BY | AJH |
| CHECKED BY | |

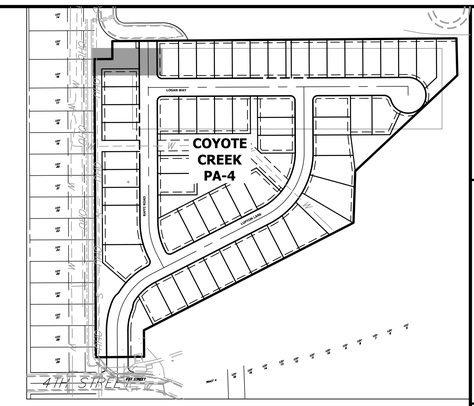
COYOTE CREEK FILING NO 4

STORM SEWER PLAN & PROFILE

SHEET 7 OF 46

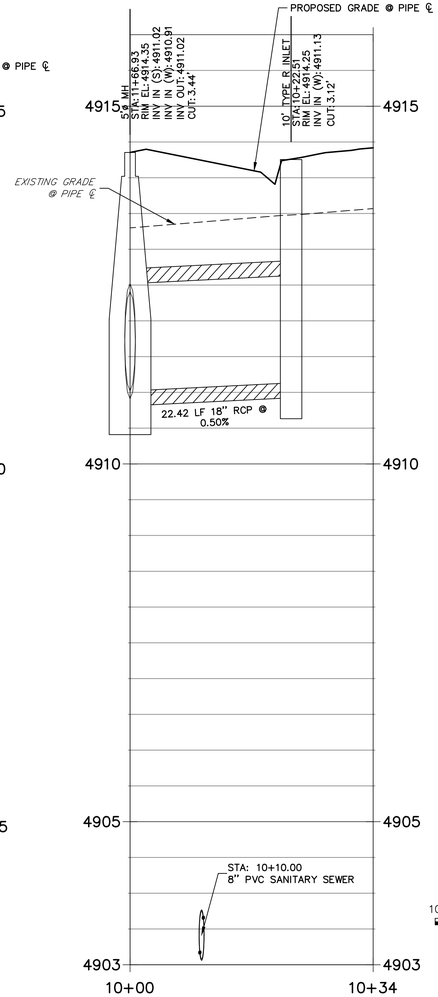
JOB NO. 16093.00




## KEY MAP
N.T.S.

## DP04-PROFILE
## STA 10+00.00 TO 10+33.98

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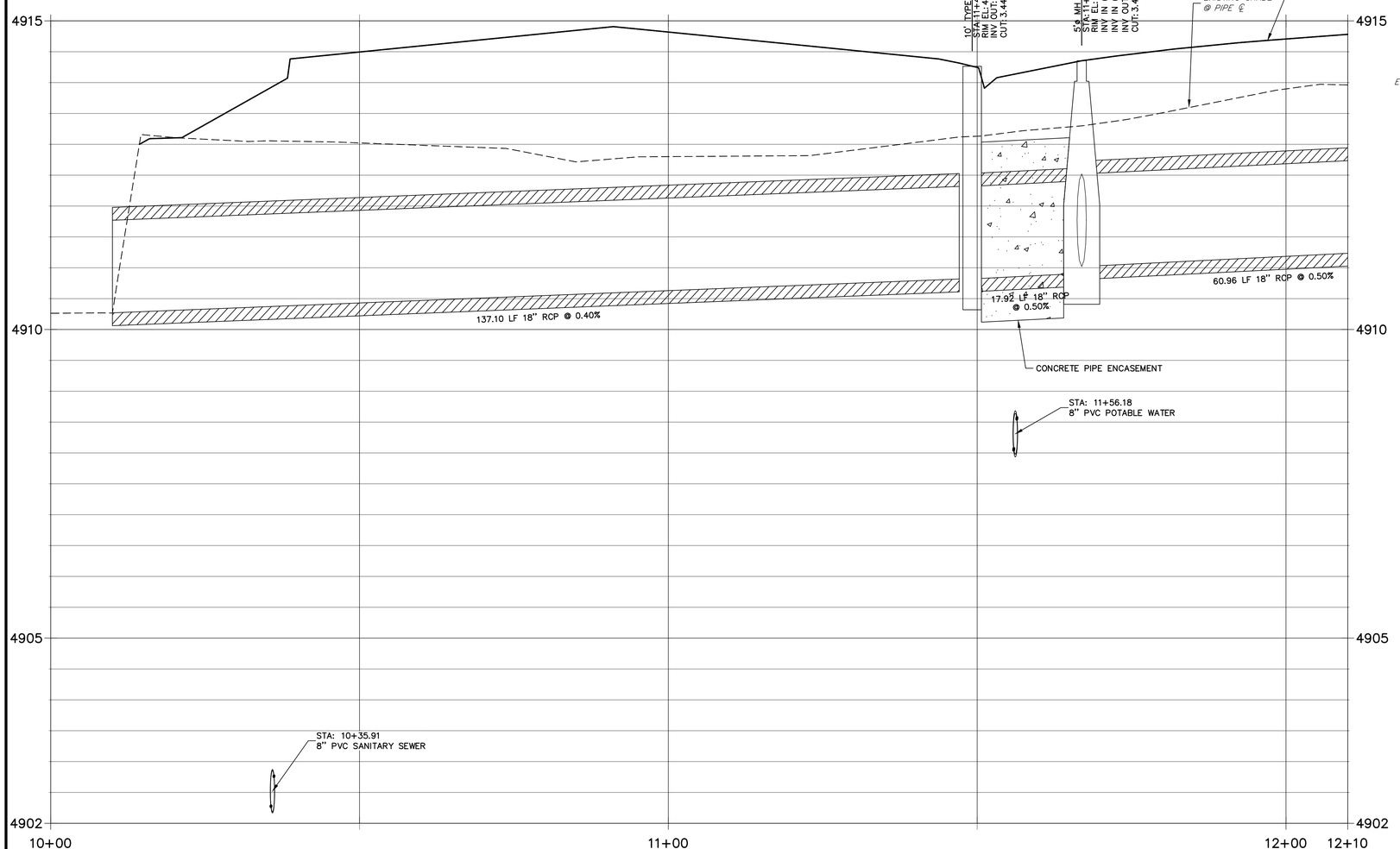
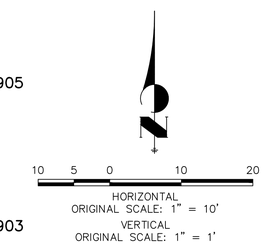
## STA 10+00.00 TO 12+10.00

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|---|---|
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| V-SCALE | 1"=5' |
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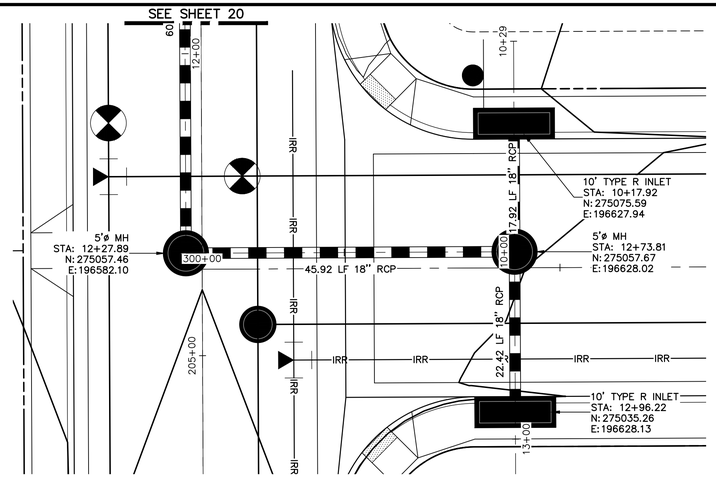
| DRAWN BY | AJH |
| CHECKED BY | |

COYOTE CREEK FILING NO 4

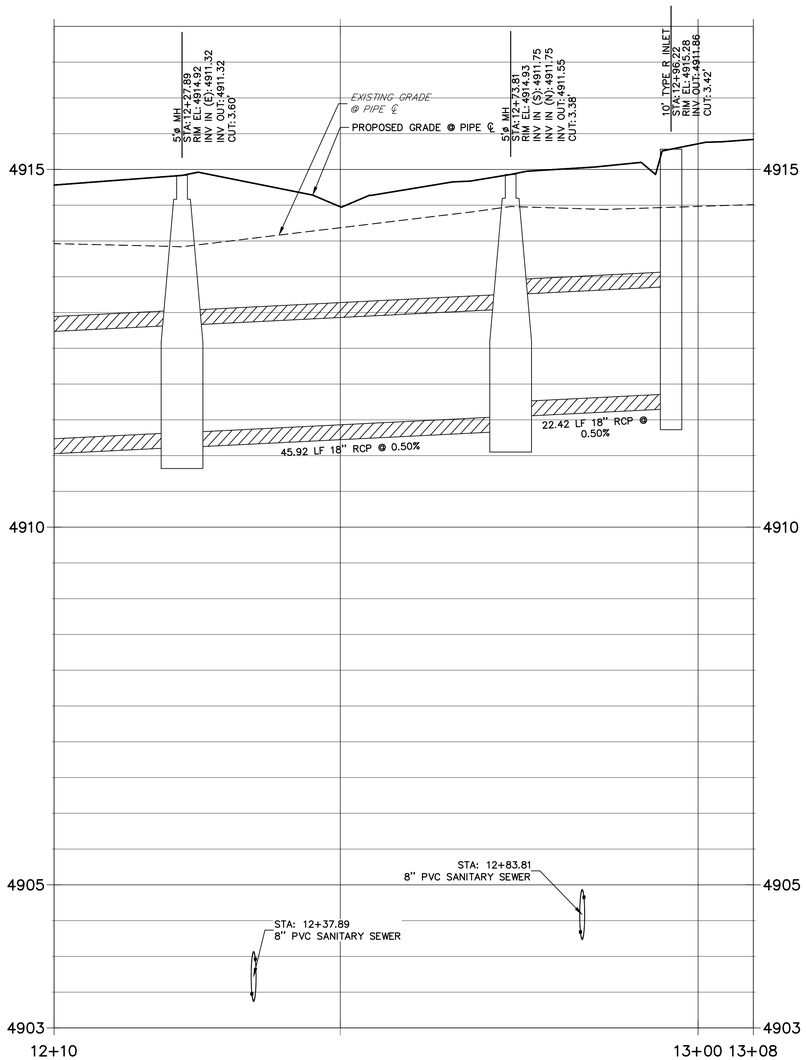
STORM SEWER PLAN & PROFILE

SHEET 9 OF 46

JOB NO. 16093.00




## DP-02 PROFILE (1)
## STA 12+10.00 TO 13+07.72

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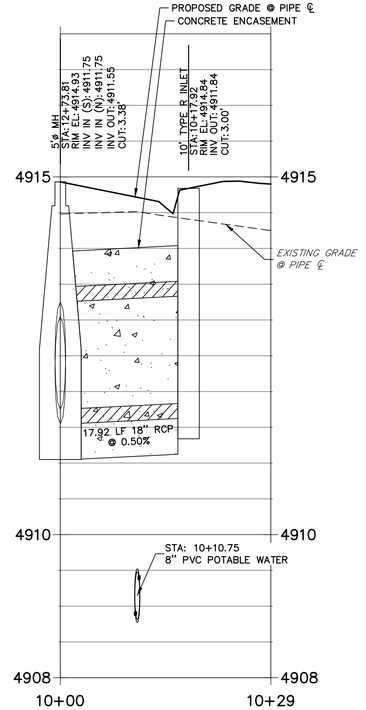
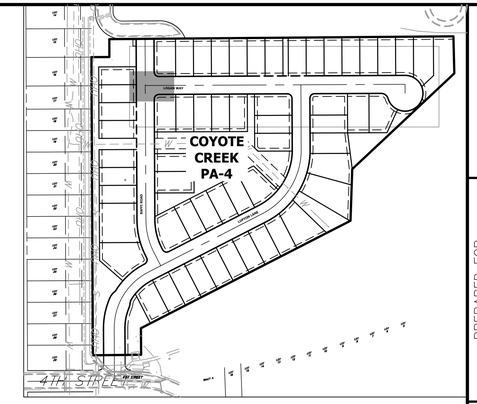
## STA 10+00.00 TO 10+29.42




**KEY MAP**
N.T.S.

10 5 0 10 20
HORIZONTAL
ORIGINAL SCALE: 1" = 10'
VERTICAL
ORIGINAL SCALE: 1" = 1'

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| DRAWN BY | AJH |
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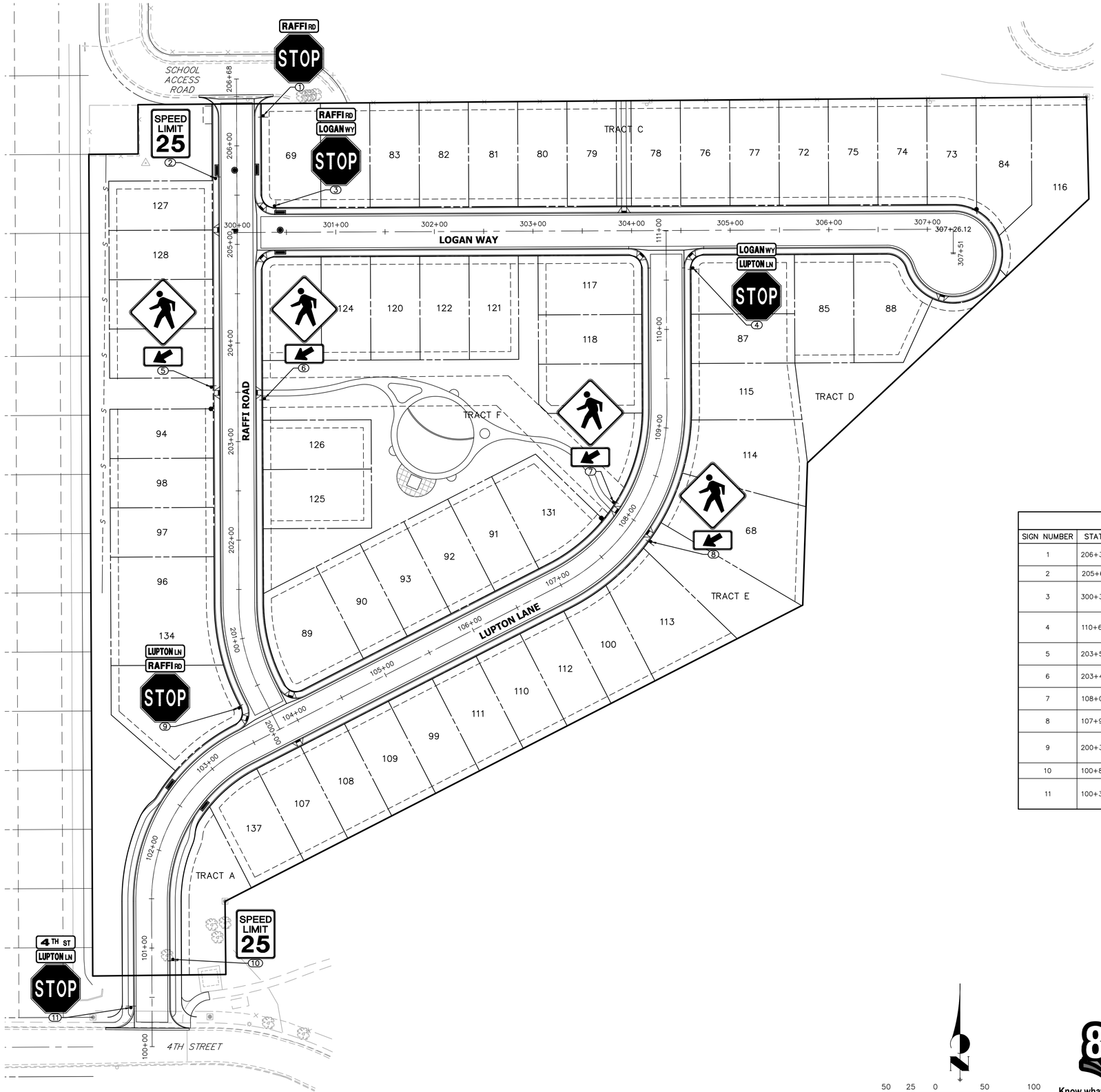
COYOTE CREEK FILING NO 4

STORM SEWER PLAN & PROFILE

SHEET 9 OF 46

JOB NO. 16093.00




| SIGN TABULATION | | | | |
|---|---|---|---|---|
| SIGN NUMBER | STATION | OFFSET | ALIGNMENT | DESCRIPTION |
| 1 | 206+30.47 | 26.92' (R) | CL– RAFFI ROAD | 24"X8" D3–1<br>30"X30" R1–1 |
| 2 | 205+67.01 | 21.71' (L) | CL– RAFFI ROAD | 24"X30" R2–1 |
| 3 | 300+37.95 | 26.92' (L) | CL– LOGAN WAY | 24"X8" D3–1<br>24"X8" D3–1<br>30"X30" R1–1 |
| 4 | 110+62.27 | 26.92' (R) | CL– LUPTON LANE | 24"X8" D3–1<br>24"X8" D3–1<br>30"X30" R1–1 |
| 5 | 203+55.33 | 26.92' (L) | CL– RAFFI ROAD | 30"X30" W11–2<br>24"X12" W16–7PL |
| 6 | 203+43.59 | 26.92' (R) | CL– RAFFI ROAD | 30"X30" W11–2<br>24"X12" W16–7PL |
| 7 | 108+04.15 | 26.92' (L) | CL– LUPTON LANE | 30"X30" W11–2<br>24"X12" W16–7PL |
| 8 | 107+92.39 | 26.92' (R) | CL– LUPTON LANE | 30"X30" W11–2<br>24"X12" W16–7PL |
| 9 | 200+38.00 | 26.92' (L) | CL– RAFFI ROAD | 24"X8" D3–1<br>24"X8" D3–1<br>30"X30" R1–1 |
| 10 | 100+88.43 | 21.42' (R) | CL– LUPTON LANE | 24"X30" R2–1 |
| 11 | 100+39.67 | 21.42' (L) | CL– LUPTON LANE | 24"X8" D3–1<br>24"X8" D3–1<br>30"X30" R1–1 |

50 25 0 50 100

ORIGINAL SCALE: 1" = 50'

Know what's below. Call before you dig.

## ENGINEER'S STATEMENT

PREPARED UNDER MY DIRECT SUPERVISION

ANDREW J. HUGILL, PE
COLORADO LIC. PE NO. 57007
FOR AND ON BEHALF OF JR ENGINEERING, LLC.

DATE

COLORADO LICENSED ANDREW J. HUGILL 57007 PROFESSIONAL ENGINEER

UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, JR ENGINEERING APPROVES THEIR USE ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

PREPARED FOR
LUPTON LAND, LLC
10221 PRESTWICK TRAIL
LONE TREE, CO 80124
BOB QUINETTE
P–303.587.1966

J·R ENGINEERING
A Westrian Company
Centennial 303–740–9393 • Colorado Springs 719–593–2593
Fort Collins 970–491–9888 • www.jrengineering.com

| No. | REVISION | BY | DATE |
|---|---|---|---|
| | | | |

| | |
|---|---|
| H–SCALE | 1"=50' |
| V–SCALE | N/A |
| DATE | 12/13/21 |
| DESIGNED BY | AJH |
| DRAWN BY | CRB |
| CHECKED BY | |

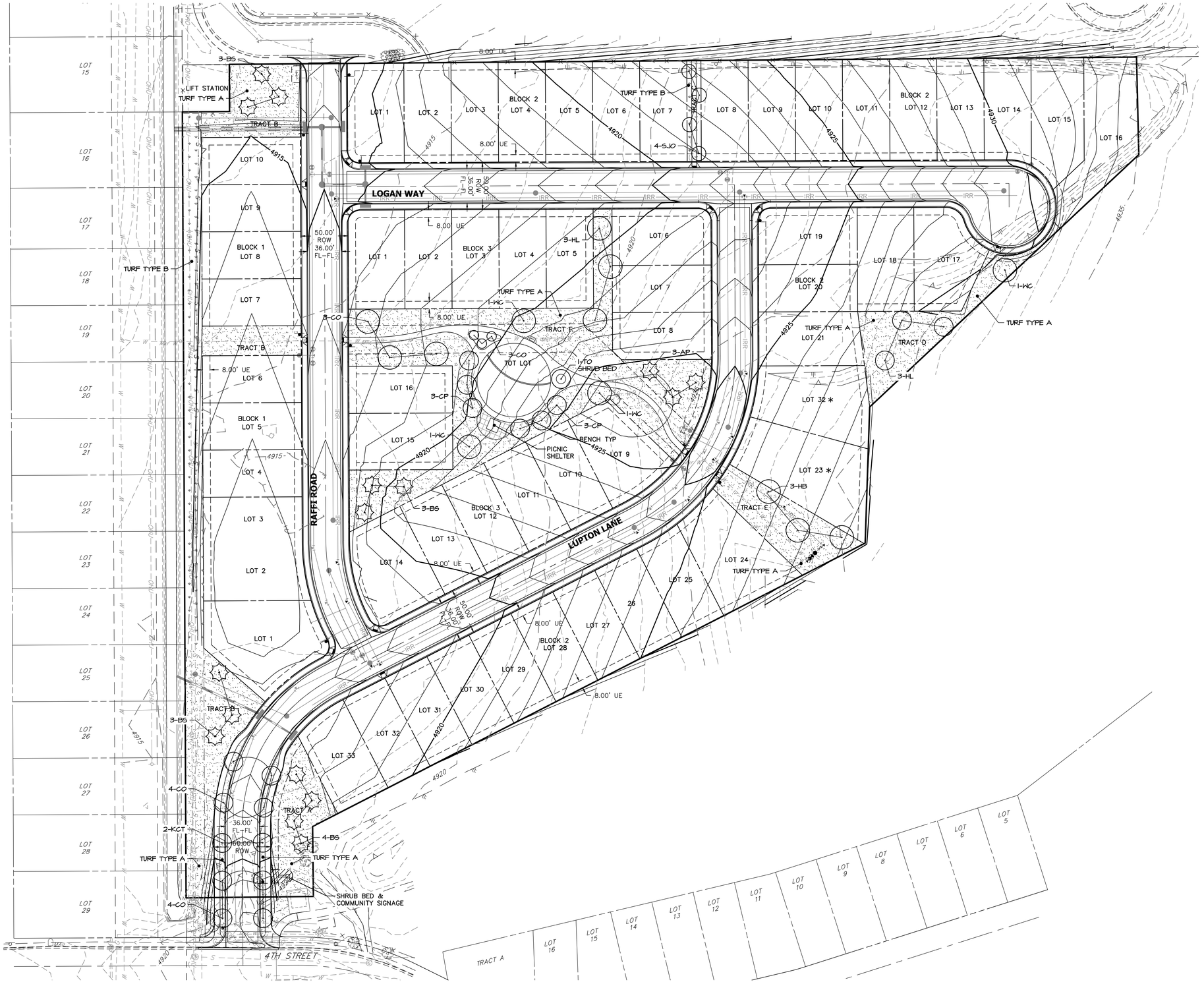
COYOTE CREEK FILING NO. 4

SIGNAGE PLAN

SHEET 22 OF 46

JOB NO. 16093.00

# COYOTE CREEK FILING NO. 4




## LANDSCAPE LEGEND

- EXISTING CONIFEROUS TREE TO BE PRESERVED
- EXISTING DECIDUOUS TREE TO BE PRESERVED
- PROPOSED MINOR/1' CONTOUR
- PROPOSED MAJOR/5' CONTOUR
- STEEL HEADER
- **TURF TYPE A:** IRRIGATED HYBRID KENTUCKY X TEXAS BLUE GRASS SOD, TURF MASTER ENVIROTURF OR APPROVED EQUAL
- **TURF TYPE B:** DROUGHT TOLERANT IRRIGATED TURF SEED MIX
- CONIFEROUS TREE 6' HGT
- DECIDUOUS STREET/ SHADE TREE, 2" CALIPER
- ORNAMENTAL TREE, 1 1/2" CALIPER SIZE
- STOP SIGN OR PARKING SIGN
- FIRE HYDRANT

## SITE LEGEND

- BOUNDARY LINE
- PROPERTY LINE
- EXISTING EASEMENT LINE
- PROPOSED EASEMENT LINE
- RIGHT OF WAY
- EXISTING WOODEN FENCE
- EXISTING GAS MAIN
- EXISTING SANITARY SEWER
- PROPOSED SANITARY SEWER
- EXISTING WATER MAIN
- PROPOSED WATER MAIN
- PROPOSED ELECTRIC
- EXISTING STORM DRAIN
- PROPOSED STORM DRAIN
- EXISTING CURB AND GUTTER
- PROPOSED SIGN
- PROPOSED CURB AND GUTTER
- EXISTING STREET LIGHTS
- PROPOSED STREET LIGHT
- 3/4" METER VAULTS
- FIRE HYDRANT

50 25 0 50 100

ORIGINAL SCALE: 1" = 50'

Know what's **below.** **Call** before you dig.

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PREPARED FOR
LUPTON LAND, LLC
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Fort Collins 970-491-9888 • www.jrengineering.com


| No. | REVISION | BY | DATE |
|---|---|---|---|
| | | | |

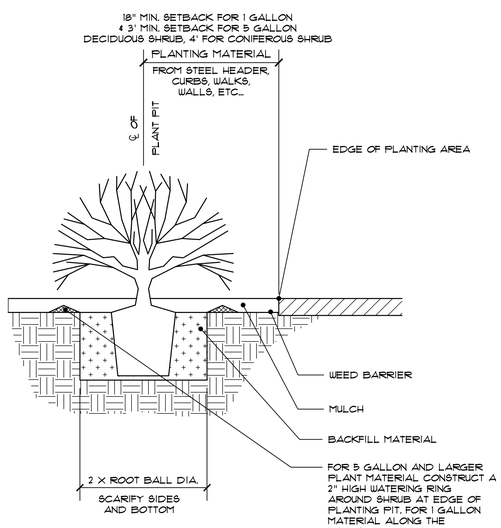
| | |
|---|---|
| H-SCALE | 1"=50' |
| V-SCALE | 1"=X' |
| DATE | 12/13/21 |
| DESIGNED BY | AJH |
| DRAWN BY | XXX |
| CHECKED BY | |

COYOTE CREEK FILING NO. 4

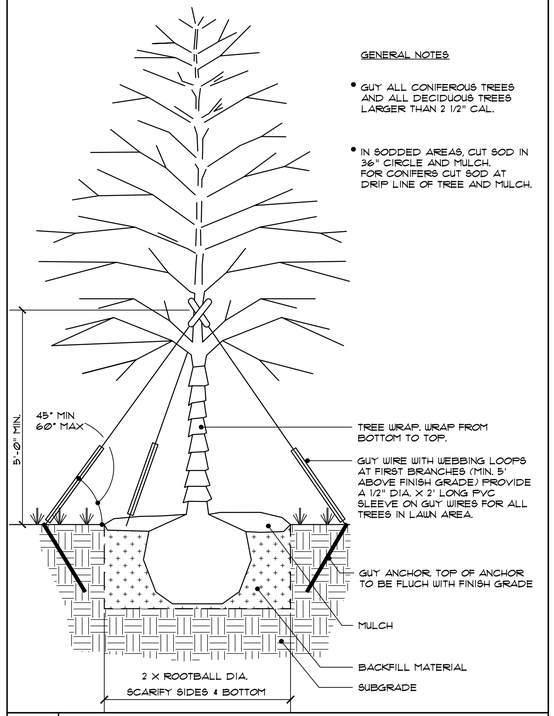
LANDSCAPE PLAN

SHEET 23 OF 46

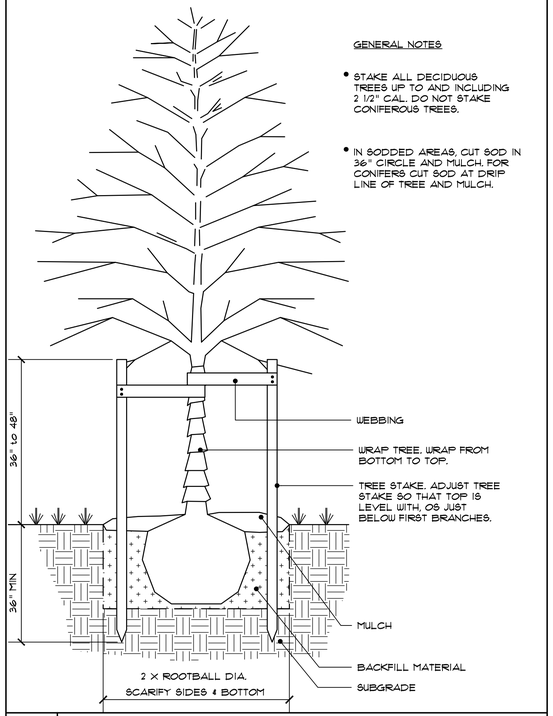
JOB NO. 16093.00



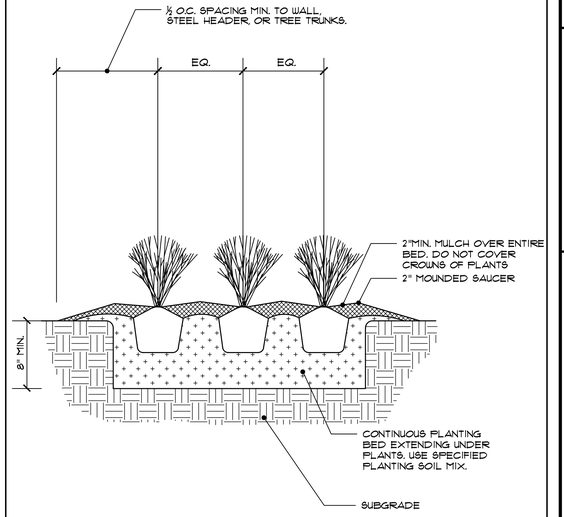

A | SHRUB PLANTING



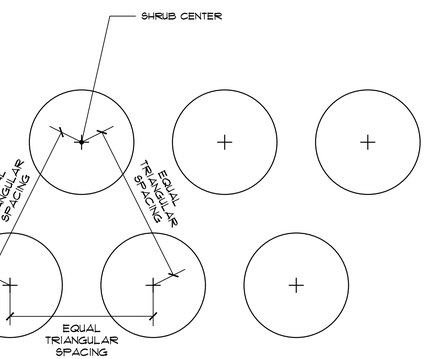

B | TREE PLANTING AND GUYING




C | TREE PLANTING AND STAKING




D | PERENNIAL PLANTING




E | TRIANGULAR SHRUB SPACING

## CONIFEROUS TREES

| Quantity | Symbol | Common Name | Botanical Name | Mitigation Size | Cont. | Kc Value | Species Diversity |
|---|---|---|---|---|---|---|---|
| 6 | AP | Autrian Pine | Pinus Nigra | 8' HGT. | B4B | L | |
| 3 | BS | Colorado Blue Spruce | Picea Pungens 'Colorado Blue' | 8' Hgt | B4B | L | |

## DECIDUOUS TREES

| Quantity | Symbol | Common Name | Botanical Name | Size | Cond. | Kc Value | Species Diversity |
|---|---|---|---|---|---|---|---|
| 8 | CO | Chinkapin Oak | Quercus Muehlenbergii | 2" Cal | B4B | M | |
| 3 | HB | Hackberry | Celtis Occidentalis | 2" Cal | B4B | L | |
| 5 | KCT | Kentucky Coffeetree | Gymnocladus Dioicus 'Espresso' | 2" Cal | B4B | L | |
| 3 | WC | Western Catalpa | Capalpa Speciosa | 3" Cal | B4B | L | |
| 1 | TRO | Texas Red Oak | Quercus Buckley | 2" Cal | B4B | L | |
| 4 | SJO | Skinny Jeans Oak | Quercus | 2" Cal | B4B | L | |

## ORNAMENTAL TREES

| Quantity | Symbol | Common Name | Botanical Name | Size | Cond. | Kc Value | Species Diversity |
|---|---|---|---|---|---|---|---|
| 6 | CP | Chanticleer Pear | Pyrus Calleryana 'Chanticleer' | 2" Cal | B4B | M | |
| 3 | ABS | Autumn Brilliance Serviceberry | Amelanchier x 'Autumn Brilliance' | 1 1/2" Cal | B4B | M | |

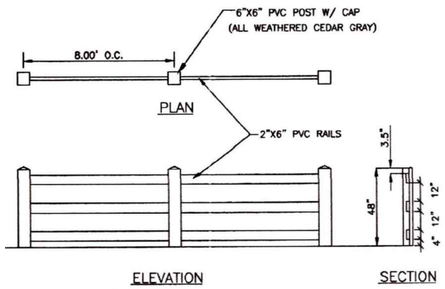
33 **Total Trees** **100%**

## TURF TYPE A:
## DROUGHT TOLERANT IRRIGATED SOD MIX

HYBRID KENTUCKY x TEXAS BLUEGRASS BEING A MIX OF 100% TEXAS BLUEGRASS HYBRID SEED. THE SEED SOURCE & TURF BASED MIX FOR SOD SHALL BE APPROVED BY THE LANDSCAPE ARCHITECT BEFORE INSTALLATION OF SOD.

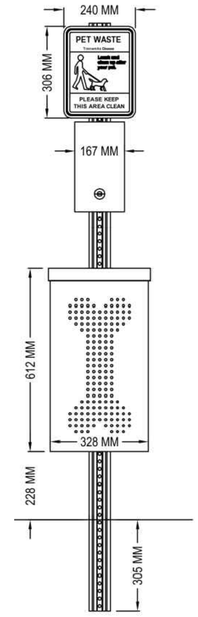
## TURF TYPE B:
## DROUGHT TOLERANT IRRIGATED TURF SEED MIX

30% EPHRAIM CRESTED WHEATGRASS, 25% DWARF PERENNIAL RYSEGRASS, 20% SR3200 BLUE FESCUE, 15% REUBENS CANADA BLUEGRASS, 10% CHEWINGS FESCUE.
**TOTAL: 15 LBS/ACRE (DRILLED) = 55 SEEDS/SF**




## SPLIT RAIL FENCE

SCALE: NTS




## DOG WASTE STATION

SCALE: NTS

UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, JR ENGINEERING APPROVES THEIR USE ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

PREPARED FOR
LUPTON LAND, LLC
10221 PRESTWICK TRAIL
LONE TREE, CO 80124
ROB QUINETTE
P-303.587.1966

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Fort Collins 970-491-9888 • www.jrengineering.com

| No. | REVISION | BY | DATE |
|---|---|---|---|
| | | | |

| | |
|---|---|
| H-SCALE | N/A |
| V-SCALE | N/A |
| DATE | 12/15/21 |
| DESIGNED BY | AJH |
| DRAWN BY | AJH |
| CHECKED BY | |

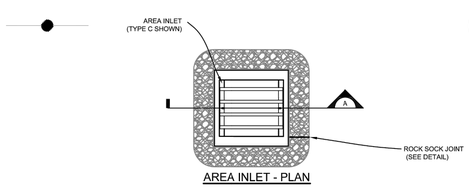
COYOTE CREEK FILING NO. 4

LANDSCAPE DETAILS

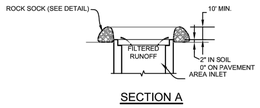
SHEET 24 OF 46

JOB NO. 16093.00

IP




AREA INLET - PLAN




SECTION A

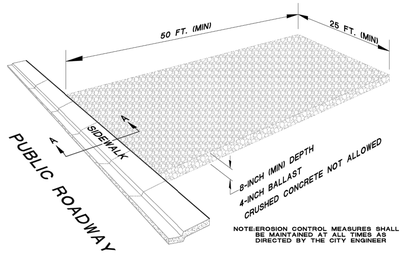
INLET PROTECTION INSTALLATION NOTES

1. INLET PROTECTION AFTER INLET CONSTRUCTION OF AFTER PAVEMENT SHALL BE INSTALLED WITHIN 48 HOUR AFTER INLET CONSTRUCTION OR PAVING IS COMPLETED.
2. STRAW WATTLES/SEDIMENT CONTROL LOGS MAY BE USED IN PLACE OF ROCK SOCKS FOR INLETS IN PERVIOUS AREAS. INSTALL PER SEDIMENT CONTROL LOG DETAIL.

INLET PROTECTION MAINTENANCE NOTES

1. THE SWMP MANAGER SHALL INSPECT INLET PROTECTION WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT AS NECESSARY. INSPECT MORE FREQUENTLY DURING WINTER CONDITIONS DUE TO FREEZE/THAW PROBLEMS. REPAIRS AS NEEDED.
2. SEDIMENT ACCUMULATED UPSTREAM OF INLET PROTECTION SHALL BE REMOVED WHEN THE SEDIMENT DEPTH UPSTREAM OF ROCK BERM IS WITHIN 2-1/2 INCHES OF THE CREST.
3. INLET PROTECTION IS TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVER IS APPROVED, UNLESS THE CITY APPROVES EARLIER REMOVAL OF INLET PROTECTION IN STREETS.
4. WHEN INLET PROTECTION AT AREA INLETS IS REMOVED, THE DISTURBED AREA SHALL BE COVERED WITH TOP SOIL, DRILL SEEDED AND CRIMP MULCHED, OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE CITY .

| CITY OF Fort Lupton EST. 1836 COME PAINT YOUR FUTURE WITH US | DESIGN STANDARDS | STANDARD DRAWING |
|---|---|---|
| | AREA INLET PROTECTION USING GRAVEL FILTER | EC 7 |
| | | DATE: 8/15/14 |



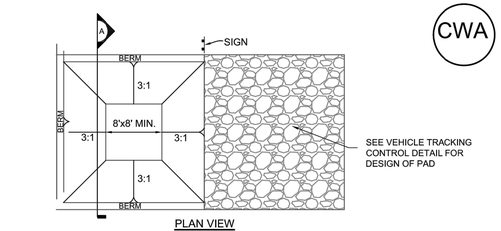

SECTION A-A
-NTS-

NOTES

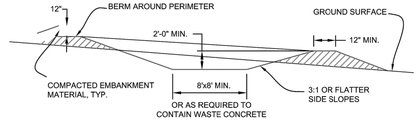
1. ALL ROCK TO BE REMOVED UPON COMPLETION OF CONSTRUCTION.
2. PUBLIC ROADWAY TO BE KEPT CLEAN AND FREE OF MUD, DIRT AND DEBRI AT ALL TIMES.

| CITY OF Fort Lupton EST. 1836 COME PAINT YOUR FUTURE WITH US | DESIGN STANDARDS | STANDARD DRAWING |
|---|---|---|
| | VEHICLE TRACKING PAD | EC 8 |
| | | DATE: 8/15/14 |

CWA




PLAN VIEW




SECTION A

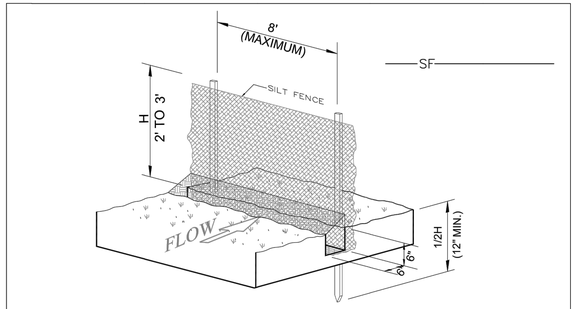
CONCRETE WASHOUT AREA INSTALLATION NOTES

1. SEE PLAN VIEW FOR LOCATIONS OF CONCRETE WASHOUT AREA.
2. THE CONCRETE WASHOUT AREA SHALL BE INSTALLED PRIOR TO ANY CONCRETE PLACEMENT ON SITE.
3. VEHICLE TRACKING CONTROL IS REQUIRED AT THE ACCESS POINT.
4. SIGNS SHALL BE PLACED AT THE CONSTRUCTION ENTRANCE, AT THE WASHOUT AREA, AND ELSEWHERE AS NECESSARY TO CLEARLY INDICATE THE LOCATION OF THE CONCRETE WASHOUT ARE TO OPERATORS OF CONCRETE TRCUYKS AND PUMP RIGS.

CONCRETE WASHOUT AREA MAINTENANCE NOTES

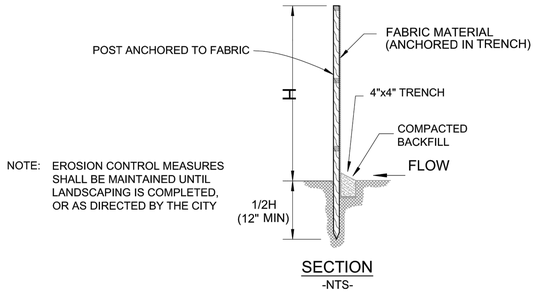
1. THE CONCRETE WASHOUT AREA SHALL BE REPAIRED AND ENLARGED OR CLEANED OUT AS NECESSARY TO MAINTAIN CAPACITY FOR WASTED CONCRETE.
2. AT THE END OF CONSTRUCTION, ALL CONCRETE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF AT AND APPROVED WASTE SITE.
3. WHEN THE CONCRETE WASHOUT AREA IS REMOVED, COVER THE DISTURBED AREA WITH TOP SOIL, DRILL SEED AND CRIMP MULCH, OR OTHERWISE STABILZE IN A MANNER APPROVED BY THE CITY.
4. INSPECT WEEKLY, DURING AND AFTER ANY STORM EVENT.
5. PORTABLE ROLLOFF TYPE OF CONCRETE WASHOUT FACILITIES WILL ALSO BE ALLOWED.

| CITY OF Fort Lupton EST. 1836 COME PAINT YOUR FUTURE WITH US | DESIGN STANDARDS | STANDARD DRAWING |
|---|---|---|
| | CONCRETE WASHOUT AREA | EC 9 |
| | | DATE: 8/15/14 |




SILT FENCE INSTALLATION

-NTS-

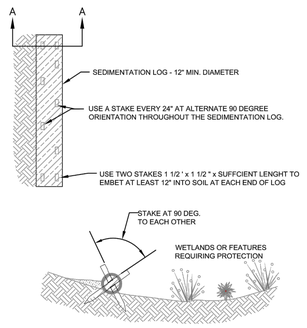



SECTION

-NTS-

| CITY OF Fort Lupton EST. 1836 COME PAINT YOUR FUTURE WITH US | DESIGN STANDARDS | STANDARD DRAWING |
|---|---|---|
| | SILT FENCE | EC 15 |
| | | DATE: 8/15/14 |

SCL




SECTION A - A

SEDIMENT CONTROL LOG INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   - LOCATION AND LENGTH OF SEDIMENT CONTROL LOG.
2. SEDIMENT CONTROL LOGS INDICATED ON INITIAL SWMP PLAN SHALL BE INSTALLED PRIOR TO ANY LAND-DISTURBING ACTIVITIES.
3. SEDIMENT CONTROL LOGS SHALL CONSIST OF STRAW, COMPOST, EXCELSIOR, OR COCONUT FIBER.
4. NOT FOR USE IN CONCENTRATED FLOW AREAS.
5. THE SEDIMENT CONTROL LOG SHALL BE TRENCHED INTO THE GROUND A MINIMUM OF 2".

SEDIMENT CONTROL LOG MAINTENANCE NOTES

1. THE SWMP MANAGER SHALL INSPECT SEDIMENT CONTROL LOGS DAILY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT UPSTREAM SEDIMENT AS NECESSARY.
2. SEDIMENT ACCUMULATED UPSTREAM OF SEDIMENT CONTROL LOGS SHALL BE REMOVED WHEN THE UPSTREAM SEDIMENT DEPTH IS WITHIN ½ THE HEIGHT OF THE CREST OF LOG.
3. SEDIMENT CONTROL LOG SHALL BE REMOVED AT THE END OF CONSTRUCTION. IF ANY DISTURBED AREA EXISTS AFTER REMOVAL, IT SHALL BE COVERED WITH TOP SOIL, DRILL SEEDED AND CRIMP MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE CITY.

| CITY OF Fort Lupton EST. 1836 COME PAINT YOUR FUTURE WITH US | DESIGN STANDARDS | STANDARD DRAWING |
|---|---|---|
| | SEDIMENT CONTROL LOGS | EC 16 |
| | | DATE: 8/15/14 |

811 Know what's below. Call before you dig.

## ENGINEER'S STATEMENT

STANDARD DETAILS SHOWN WERE REVIEWED ONLY AS TO THEIR APPLICATION ON THIS PROJECT.

ANDREW J. HUGILL, PE
COLORADO LIC. PE NO. 57007
FOR AND ON BEHALF OF JR ENGINEERING, LLC.

DATE

UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, JR ENGINEERING APPROVES THEIR USE ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

PREPARED FOR
LUPTON LAND, LLC
10221 PRESTWICK TRAIL
LONE TREE, CO 80124
BOB QUINETTE
P-303.587.1966

J·R ENGINEERING
A Westrian Company
Centennial 303-740-9393 • Colorado Springs 719-593-2593
Fort Collins 970-491-9888 • www.jrengineering.com

| No. | REVISION | BY | DATE |
|---|---|---|---|

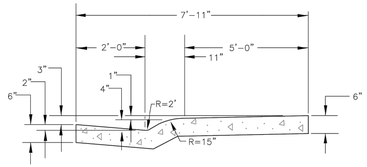
| | |
|---|---|
| H-SCALE | N/A |
| V-SCALE | N/A |
| DATE | 12/13/21 |
| DESIGNED BY | N/A |
| DRAWN BY | SWW |
| CHECKED BY | |

COYOTE CREEK FILING NO 4

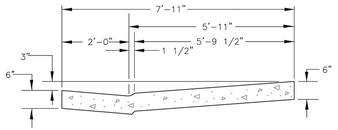
DETAILS

SHEET 25 OF 46

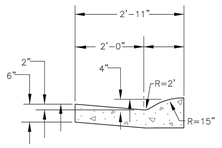
JOB NO. 16093.00




COMBINATION CURB, GUTTER & WALK
STANDARD SECTION

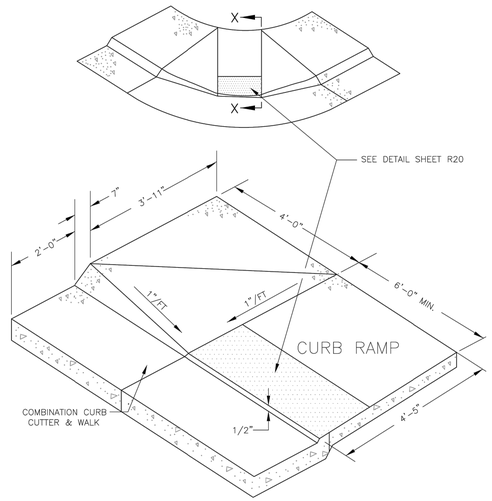



COMBINATION CURB, GUTTER & WALK
DEPRESSED SECTION




4" MOUNTABLE CURB & GUTTER

| CITY OF Fort Lupton EST. 1836 COME PAINT YOUR FUTURE WITH US | DESIGN STANDARDS | STANDARD DRAWING |
|---|---|---|
| | COMBINATION CURB, GUTTER, AND WALK | R8 |
| | | DATE: 8/15/14 |

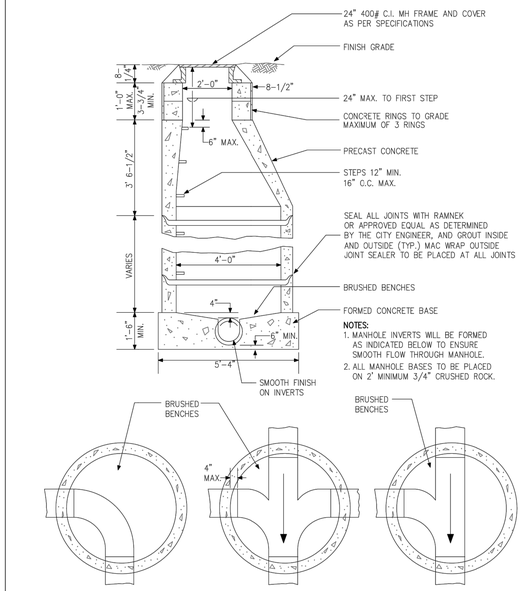



SECTION X–X

NOTE:

* COARSE BROOM FINISH ON RAMP.
* SPECIAL DESIGNS ARE REQUIRED WHEN GRADES ARE OVER 4% OR WHERE THE ANGLE OF THE INTERSECTION IS LESS THAN 78 DEGREES OR MORE THAN 105 DEGREES.
* MAINTAIN BACK OF WALK ELEVATION AT 2.0% ABOVE TOP OF CURB.

| CITY OF Fort Lupton EST. 1836 COME PAINT YOUR FUTURE WITH US | DESIGN STANDARDS | STANDARD DRAWING |
|---|---|---|
| | CURB RAMP COMBINATION CURB, GUTTER, AND WALK | R9 |
| | | DATE: 8/15/14 |



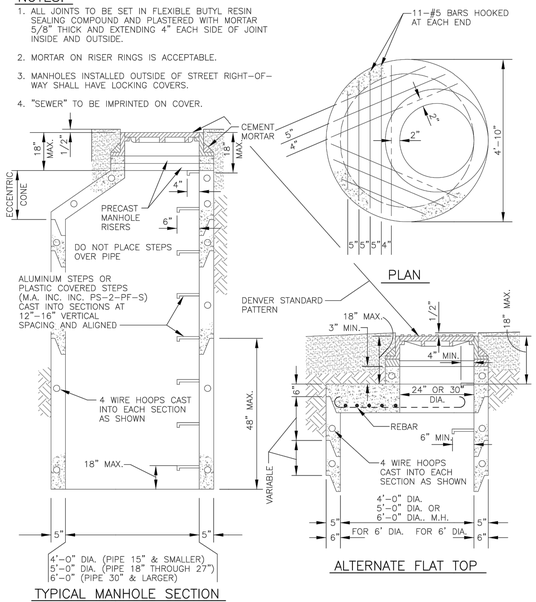

NOTES:

1. MANHOLE INVERTS WILL BE FORMED AS INDICATED BELOW TO ENSURE SMOOTH FLOW THROUGH MANHOLE.
2. ALL MANHOLE BASES TO BE PLACED ON 2" MINIMUM 3/4" CRUSHED ROCK.

| CITY OF Fort Lupton EST. 1836 COME PAINT YOUR FUTURE WITH US | DESIGN STANDARDS | STANDARD DRAWING |
|---|---|---|
| | SANITARY SEWER STANDARD MANHOLE | SS1 |
| | | DATE: 8/15/14 |

NOTES:

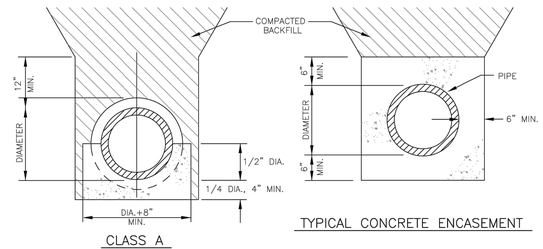
1. ALL JOINTS TO BE SET IN FLEXIBLE BUTYL RESIN SEALING COMPOUND AND PLASTERED WITH MORTAR 5/8" THICK AND EXTENDING 4" EACH SIDE OF JOINT INSIDE AND OUTSIDE.
2. MORTAR ON RISER RINGS IS ACCEPTABLE.
3. MANHOLES INSTALLED OUTSIDE OF STREET RIGHT–OF–WAY SHALL HAVE LOCKING COVERS.
4. "SEWER" TO BE IMPRINTED ON COVER.




TYPICAL MANHOLE SECTION
WITH ECCENTRIC CONE

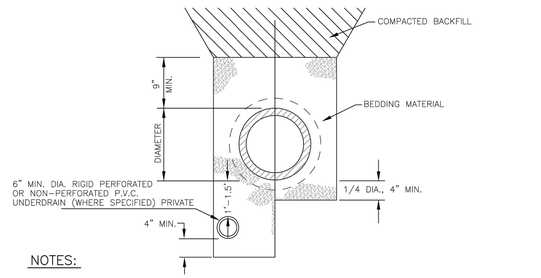
ALTERNATE FLAT TOP

| CITY OF Fort Lupton EST. 1836 COME PAINT YOUR FUTURE WITH US | DESIGN STANDARDS | STANDARD DRAWING |
|---|---|---|
| | MANHOLE BARRELS AND ALTERNATE TOPS | SS2 |
| | | DATE: 8/15/14 |




CLASS A
CONCRETE CRADLE

TYPICAL CONCRETE ENCASEMENT

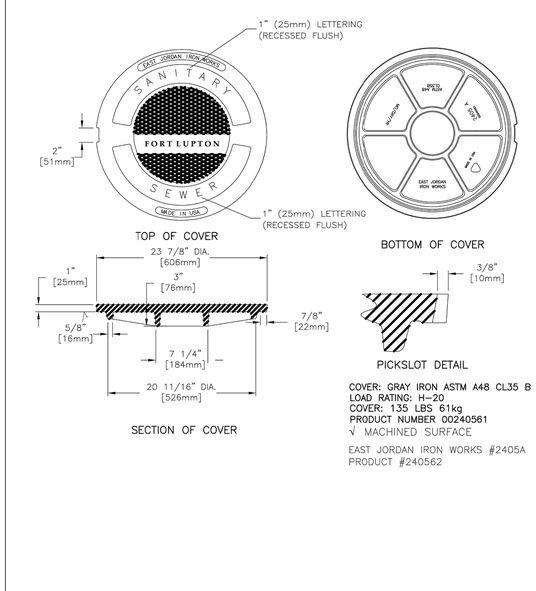



NOTES:

1. THIS DETAIL IS TO BE USED UNDER NORMAL CONDITIONS. WHERE EXCESSIVE GROUND WATER IS PRESENT AN ALTERNATE DESIGN WILL BE REQUIRED.

CLASS B
GRANULAR BEDDING

| CITY OF Fort Lupton EST. 1836 COME PAINT YOUR FUTURE WITH US | DESIGN STANDARDS | STANDARD DRAWING |
|---|---|---|
| | TYPICAL PIPE BEDDING | SS6 |
| | | DATE: 8/15/14 |




COVER: GRAY IRON ASTM A48 CL35 B
LOAD RATING: H–20
COVER: 135 LBS 61kg
PRODUCT NUMBER 00240561
√ MACHINED SURFACE

EAST JORDAN IRON WORKS #2405A
PRODUCT #240562

| CITY OF Fort Lupton EST. 1836 COME PAINT YOUR FUTURE WITH US | DESIGN STANDARDS | STANDARD DRAWING |
|---|---|---|
| | SANITARY SEWER MANHOLE LID | SS12 |
| | | DATE: 8/15/14 |

Know what's below. Call before you dig.

## ENGINEER'S STATEMENT

STANDARD DETAILS SHOWN WERE REVIEWED ONLY AS TO THEIR APPLICATION ON THIS PROJECT.

ANDREW J. HUGILL, PE
COLORADO LIC. PE NO. 57007
FOR AND ON BEHALF OF JR ENGINEERING, LLC.

DATE

UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, JR ENGINEERING APPROVES THEIR USE ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

PREPARED FOR
LUPTON LAND, LLC
10221 PRESTWICK TRAIL
LONE TREE, CO 80124
BOB QUINETTE
P–303.587.1966

J·R ENGINEERING
A Westrian Company
Centennial 303–740–9393 • Colorado Springs 719–593–2593
Fort Collins 970–491–9888 • www.jrengineering.com

| No. | REVISION | BY | DATE |
|---|---|---|---|
| | | | |

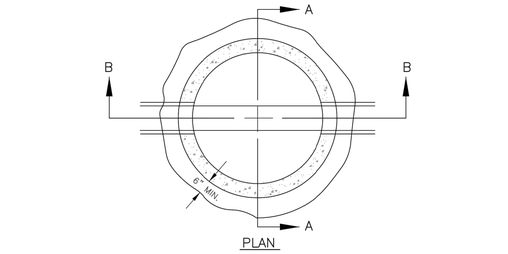
| | |
|---|---|
| H–SCALE | N/A |
| V–SCALE | N/A |
| DATE | 12/13/21 |
| DESIGNED BY | N/A |
| DRAWN BY | SWW |
| CHECKED BY | |

COYOTE CREEK FILING NO 4

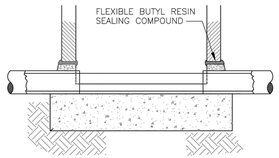
DETAILS

SHEET 26 OF 46

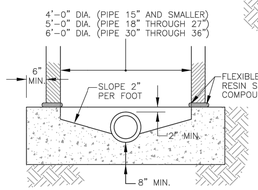
JOB NO. 16093.00




PLAN




SECTION B–B

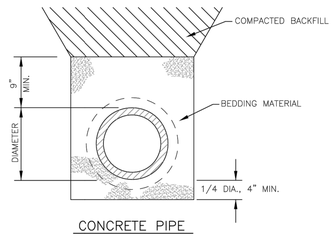



SECTION A–A

NOTES:

1. JOINTS TO BE SET IN FLEXIBLE BUTYL RESIN SEALING COMPOUND AND GROUTED WITH MORTAR INSIDE AND OUTSIDE.
2. BASES SHALL BE REINFORCED WHEN THE DISTANCE FROM INVERT TO TOP OF COVER WILL EXCEED 15 FT. REINFORCING TO BE APPROVED BY CITY ENGINEER.
3. SQUARE BASES ARE ACCEPTABLE.
4. FOR PIPE 36" AND LARGER, OR WHERE CONDITIONS SUCH AS MULTIPLE PIPES WARRANT, A CONCRETE BOX BASE WILL BE REQUIRED. (SEE CDOT STANDARD DRAWING M–604–20)

| CITY OF Fort Lupton EST. 1836 COME PAINT YOUR FUTURE WITH US | DESIGN STANDARDS | STANDARD DRAWING |
|---|---|---|
| | STANDARD MANHOLE BASE | ST1 |
| | | DATE: 8/15/14 |

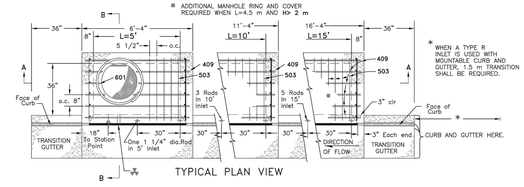



CONCRETE PIPE

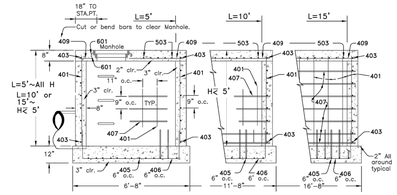
NOTES:

1. THIS DETAIL IS TO BE USED UNDER NORMAL CONDITIONS. WHERE EXCESSIVE GROUND WATER IS PRESENT AN ALTERNATE DESIGN WILL BE REQUIRED.

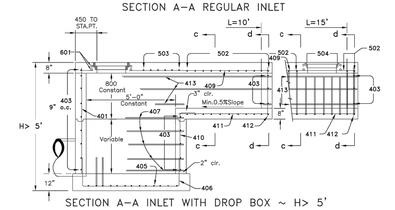
| CITY OF Fort Lupton EST. 1836 COME PAINT YOUR FUTURE WITH US | DESIGN STANDARDS | STANDARD DRAWING |
|---|---|---|
| | TYPICAL PIPE BEDDING | ST4 |
| | | DATE: 8/15/14 |




TYPICAL PLAN VIEW



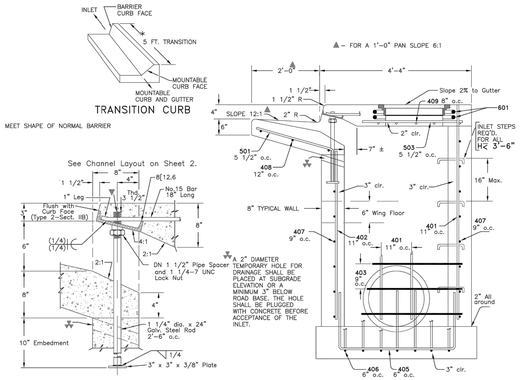

SECTION A–A REGULAR INLET




SECTION A–A INLET WITH DROP BOX ~ H> 5'

(1 OF 4)

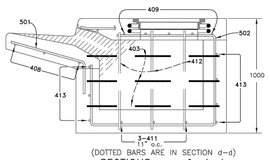
| CITY OF Fort Lupton EST. 1836 COME PAINT YOUR FUTURE WITH US | DESIGN STANDARDS | STANDARD DRAWING |
|---|---|---|
| | CURB INLET TYPE R | ST5 |
| | | DATE: 8/15/14 |




CURB FACE ASSEMBLY, PLACE ENTIRE ASSEMBLY BEFORE POURING CONCRETE

SECTION B–B TYPICAL END VIEW

NOTE: MANHOLE RING & COVER, STATION POINT AND OUTFLOW PIPE SHALL BE LOCATED AT THE SAME END OF THE INLET.




(DOTTED BARS ARE IN SECTION d–d)

SECTIONS c–c & d–d

(2 OF 4)

| CITY OF Fort Lupton EST. 1836 COME PAINT YOUR FUTURE WITH US | DESIGN STANDARDS | STANDARD DRAWING |
|---|---|---|
| | CURB INLET TYPE R | ST6 |
| | | DATE: 8/15/14 |

TABLE ONE ~ BAR LIST FOR CURB INLETS, TYPE "R"

| MARK | DIA (in) | O.C. SPACING (in) | TYPE | ALL INLETS L≤ — 5' NO. REQ'D. | ALL INLETS L≤ — 5' LENGTH (ft–in) | INLETS, H ≥ 5' 10' NO. REQ'D. | INLETS, H ≥ 5' 10' LENGTH (ft–in) | INLETS, H ≥ 5' 15' NO. REQ'D. | INLETS, H ≥ 5' 15' LENGTH (ft–in) | INLETS, H ≥ 5' 10' NO. REQ'D. | INLETS, H ≥ 5' 10' LENGTH (ft–in) | INLETS, H ≥ 5' 15' NO. REQ'D. | INLETS, H ≥ 5' 15' LENGTH (ft–in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 401 | # | 11" | II | 15 | * | 21 | * | 26 | * | 11 | * | 11 | * |
| 402 | # | 11" | II | 7 | * | 13 | * | 18 | * | 7 | * | 7 | * |
| 403 | # | 9" | II | * | 4'–0" | * | 4'–0" | * | 4'–0" | * | 4'–0" | * | 4'–0" |
| 405 | # | 6" | XI | 11 | 6'–10" | 21 | 6'–10" | 31 | 6'–10" | 11 | 6'–10" | 11 | 6'–10" |
| 406 | # | 6" | XIII | 7 | 8'–10" | 7 | 13'–10" | 7 | 18'–10" | 7 | 8'–10" | 7 | 8'–10" |
| 407 | 1/2" | 9" | II | * | 5'–10" | * | 10'–10" | * | 15'–10" | * | 5'–10" | * | 5'–10" |
| 408 | # | 12" | II | 3 | 6'–0" | 3 | 11'–0" | 3 | 16'–0" | 3 | 11'–0" | 3 | 16'–0" |
| 409 | # | 8" | II | 6 | 5'–10" | 6 | 10'–10" | 6 | 15'–10" | 6 | 10'–10" | 6 | 15'–10" |
| 410 | # | 11" | XI | | | | | | | 3 | * | 3 | * |
| 411 | # | 11" | II | | | | | | | 3 | 5'–2" | 3 | 10'–2" |
| 412 | # | 11" | II | | | | | | | 3 | 2'–9" | 3 | 2'–9" |
| 413 | # | 9" | II | | | | | | | 7 | 10'–10" | 7 | 15'–10" |
| 501 | # | 5 1/2" | IX | 11 | 3'–4" | 22 | 3'–4" | 33 | 3'–4" | 22 | 3'–4" | 33 | 3'–4" |
| 502 | 5/8 | 5 1/2" | III | | | | | | | 11 | 11'–5" | 17 | 11'–5" |
| 503 | | 5 1/2" | II | 5 | 3'–6" | 16 | 3'–6" | 27 | 3'–6" | 6 | 3'–6" | 6 | 3'–6" |
| 504 | # | 5 1/2" | II | | | | | | | | | 5 | 8'–4" |
| 601 | 3/4" | 2 1/2" | V | 2 | 8'–10" | 2 | 8'–10" | 2 | 8'–10" | 2 | 8'–10" | 4 | 8'–10" |
| ∅8 | 8.5 | | | 1 | 5'–10" | 1 | 10'–10" | 1 | 15'–10" | 1 | 10'–10" | 1 | 15'–10" |
| ▼ | | | | 2 BARS, 1 ROD | —— | 4 BARS, 3 RODS | —— | 8 BARS, 5 RODS | —— | 4 BARS, 3 RODS | —— | 8 BARS, 5 RODS | —— |

* VARIABLE, REFER TO TABLE TWO.
∅ INCLUDE 18" NO. 4 BARS (SEE CHANNEL LAYOUT DETAIL).
▼ SEE CURB FACE ASSEMBLY ON SHEET 2 AND CHANNEL LAYOUT DETAILS ON SHEET 4.

REGULAR INLETS

DROP BOX INLETS

TABLE TWO ~ BARS AND QUANTITIES VARIABLE WITH "H"

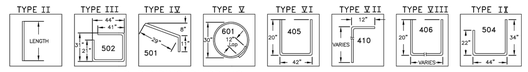
| "H" (ft–in) | LENGTH (ft–in) 401 | 402 | 410 | NO. REQD. PER INLET 403 | 407 | NO. REQD. PER INLET 403 | 407 | L= 5' CONC. CU.YD. | L= 5' STEEL LBS. | L= 10' CONC. CU.YD. | L= 10' STEEL LBS. | L= 15' CONC. CU.YD. | L= 15' STEEL LBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3'–0" | 2'–8" | 1'–8" | | 10 | 7 | | | 3.2 | 285 | 5.3 | 497 | 7.4 | 708 |
| 3'–6" | 3'–2" | 2'–2" | | 10 | 7 | | | 3.4 | 305 | 5.7 | 528 | 7.9 | 747 |
| 4'–0" | 3'–8" | 2'–8" | | 12 | 9 | | | 3.7 | 326 | 6.0 | 559 | 8.4 | 786 |
| 4'–6" | 4'–2" | 3'–2" | | 12 | 9 | | | 3.9 | 334 | 6.4 | 571 | 8.8 | 803 |
| 5'–0" | 4'–8" | 3'–8" | | 14 | 11 | | | 4.1 | 354 | 6.7 | 602 | 9.3 | 844 |
| 5'–6" | 5'–2" | 4'–2" | 3'–5" | 16 | 13 | 15 | 6 | 4.4 | 375 | 6.0 | 607 | 7.4 | 850 |
| 6'–0" | 5'–8" | 4'–8" | 3'–11" | 16 | 13 | 16 | 6 | 4.6 | 382 | 6.2 | 616 | 7.6 | 860 |
| 6'–6" | 6'–2" | 5'–2" | 4'–5" | 18 | 15 | 18 | 8 | 4.8 | 402 | 6.4 | 637 | 7.8 | 880 |
| 7'–0" | 6'–8" | 5'–8" | 4'–11" | 20 | 17 | 19 | 10 | 5.0 | 423 | 6.6 | 654 | 8.0 | 897 |
| 7'–6" | 7'–2" | 6'–2" | 5'–5" | 20 | 17 | 20 | 10 | 5.3 | 430 | 6.9 | 664 | 8.3 | 907 |
| 8'–0" | 7'–8" | 6'–8" | 5'–11" | 22 | 19 | 22 | 12 | 5.5 | 451 | 7.1 | 684 | 8.5 | 927 |
| 8'–6" | 8'–2" | 7'–2" | 6'–5" | 24 | 21 | 23 | 14 | 5.7 | 471 | 7.3 | 702 | 8.7 | 944 |
| 9'–0" | 8'–8" | 7'–8" | 6'–11" | 24 | 21 | 24 | 14 | 6.0 | 479 | 7.6 | 711 | 9.0 | 954 |
| 9'–6" | 9'–2" | 8'–2" | 7'–5" | 26 | 23 | 26 | 16 | 6.2 | 499 | 7.8 | 732 | 9.2 | 974 |
| 10'–0" | 9'–8" | 8'–8" | 7'–11" | 28 | 25 | 27 | 18 | 6.4 | 520 | 8.0 | 749 | 9.4 | 992 |
| 10'–6" | 10'–2" | 9'–2" | 8'–5" | 28 | 25 | 28 | 18 | 6.7 | 527 | 8.3 | 759 | 9.7 | 1001 |
| 11'–0" | 10'–8" | 9'–8" | 8'–11" | 30 | 27 | 30 | 20 | 6.9 | 547 | 8.5 | 779 | 9.9 | 1022 |

NOTE: FOR L= 5', L= 10' AND L= 15'

REGULAR INLETS: TOTAL QUANTITIES NEEDED ARE OUTSIDE OF THE HEAVY BLACK LINE.

DROP BOX INLETS: TOTAL QUANTITIES NEEDED ARE INSIDE OF THE HEAVY BLACK LINE.

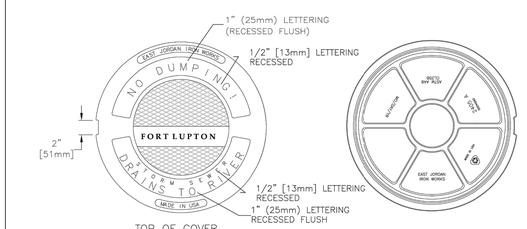
STEEL WEIGHTS DO NOT INCLUDE STRUCTURAL STEEL.




BAR BENDING DIAGRAMS ~ (Dimensions are Out–to–Out of bar)

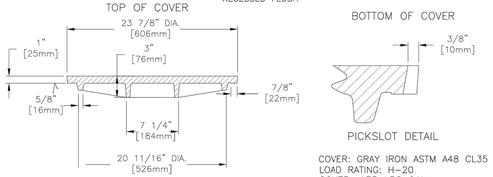
(3 OF 4)

| CITY OF Fort Lupton EST. 1836 COME PAINT YOUR FUTURE WITH US | DESIGN STANDARDS | STANDARD DRAWING |
|---|---|---|
| | CURB INLET TYPE R | ST7 |
| | | DATE: 8/15/14 |




TOP OF COVER

BOTTOM OF COVER




SECTION OF COVER




PICKSLOT DETAIL

COVER: GRAY IRON ASTM A48 CL35 B
LOAD RATING: H–20
COVER: 135 LBS 61kg
PRODUCT NUMBER 00240562
√ MACHINED SURFACE

EAST JORDAN IRON WORKS #2405A
PRODUCT #240562

(4 OF 4)

| CITY OF Fort Lupton EST. 1836 COME PAINT YOUR FUTURE WITH US | DESIGN STANDARDS | STANDARD DRAWING |
|---|---|---|
| | CURB INLET TYPE R | ST8 |
| | | DATE: 8/15/14 |

UNTIL SUCH TIME AS THESE DOCUMENTS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, JR ENGINEERING APPROVES THEIR USE ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

PREPARED FOR
LUPTON LAND, LLC
10221 PRESTWICK TRAIL
LONE TREE, CO 80124
BOB QUINETTE
P–303.587.1966

J·R ENGINEERING
A Westrian Company
Centennial 303–740–9393 • Colorado Springs 719–593–2593
Fort Collins 970–491–9888 • www.jrengineering.com

| No. | REVISION | BY | DATE |
|---|---|---|---|
| | | | |

| H–SCALE | V–SCALE | DATE | DESIGNED BY | DRAWN BY | CHECKED BY |
|---|---|---|---|---|---|
| N/A | N/A | 12/13/21 | N/A | SWW | |

COYOTE CREEK FILING NO 4

DETAILS

Know what's below. Call before you dig.

## ENGINEER'S STATEMENT

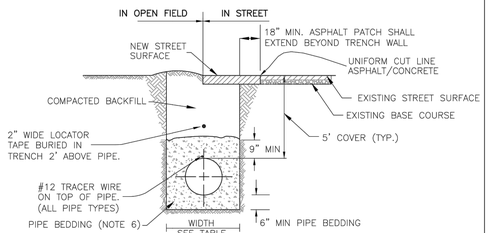
STANDARD DETAILS SHOWN WERE REVIEWED ONLY AS TO THEIR APPLICATION ON THIS PROJECT.

ANDREW J. HUGILL, PE
COLORADO LIC. PE NO. 57007
FOR AND ON BEHALF OF JR ENGINEERING, LLC.

DATE

SHEET 27 OF 46

JOB NO. 16093.00




## TYPICAL TRENCH SECTION

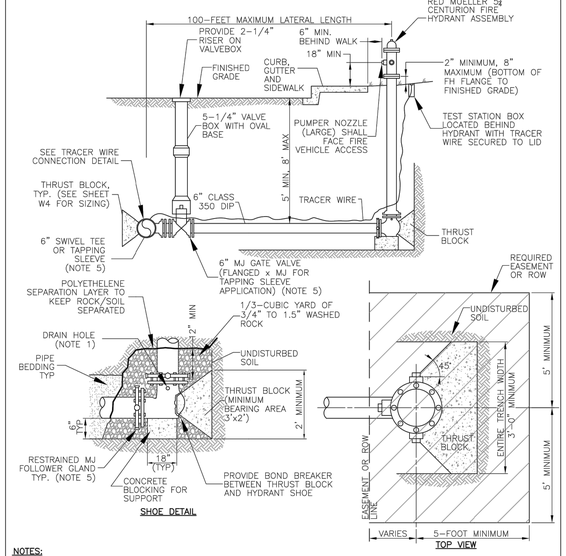
### TRENCH WIDTH

| PIPE DIAMETER | MINIMUM WIDTH | MAXIMUM WIDTH |
|---|---|---|
| 4" | 1'-4" | 2'-4" |
| 6" | 1'-6" | 2'-6" |
| 8" | 1'-8" | 2'-8" |
| 12" | 2'-0" | 3'-0" |
| 16" | 2'-4" | 3'-4" |
| 20" | 2'-8" | 3'-8" |
| 24" | 4'-0" | 5'-0" |

NOTES:

1. TRENCHES 5 FT DEEP OR GREATER REQUIRE A "PROTECTIVE SYSTEM" AS DEFINED BY OSHA. TRENCHES 20 FT DEEP OR GREATER REQUIRE THAT THE PROTECTIVE SYSTEM BE DESIGN BY A REGISTERED PROFESSIONAL ENGINEER.
2. OSHA'S STANDARDS REQUIRE THAT TRENCHES BE INSPECTED DAILY AND AS CONDITIONS CHANGE BY A "COMPETENT PERSON" (AS DEFINED BY OSHA) PRIOR TO WORKER ENTRY TO ENSURE ELIMINATION OF EXCAVATION HAZARDS. FOR ADDITIONAL INFORMATION REGARDING OSHA REQUIREMENTS CALL 1-800-321-OSHA.
3. MINIMUM COVER OVER PIPE TO BE BELOW OFFICIAL STREET GRADE.
4. FOR PIPE BEDDING REQUIREMENTS REFER TO CHAPTER 9 OF THE STANDARDS AND SPECIFICATIONS.
5. PIPE BEDDING SHALL BE PLACED AGAINST UNDISTURBED SOIL IN THE TRENCH BOTTOM, HOWEVER, WHERE ADVERSE SOIL IS ENCOUNTERED IN THE TRENCH BOTTOM, SOIL SHALL BE REMOVED AND TRENCH STABILIZATION MATERIAL SHALL BE PLACED IN ACCORDANCE WITH THE RECOMMENDATIONS OF A GEOTECHNICAL ENGINEER.

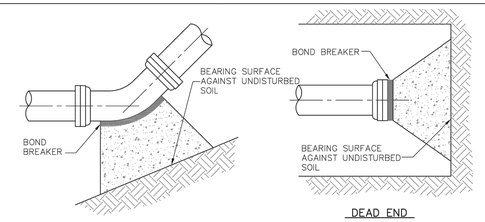
| DESIGN STANDARDS | STANDARD DRAWING |
|---|---|
| TYPICAL TRENCH SECTION PIPE PROTECTION | W1 |
| | DATE: 8/15/14 |




NOTES:

1. ALL FITTINGS, DI PIPE, AND HYDRANT BARREL SHALL BE POLYETHYLENE WRAPPED PER AWWA C-105. PROVIDE PERFORATION AT HYDRANT DRAIN HOLES.
2. PRIOR TO PUTTING INTO SERVICE THE FOLLOWING SHALL BE PERFORMED: NOZZLE THREADS SHALL BE GREASED, OIL RESERVOIR SHALL BE FILLED, AND HYDRANTS SHALL BE BRUSH PAINTED FIRE ENGINE RED (#7407).
3. THE ENTIRE PIPING ASSEMBLY (HYDRANT SHOE TO CONNECTION AT MAIN) SHALL BE FULLY RESTRAINED.

| DESIGN STANDARDS | STANDARD DRAWING |
|---|---|
| FIRE HYDRANT INSTALLATION DETAIL | W2 |
| | DATE: 8/15/14 |




TYPICAL PIPE/THRUST BLOCK CROSS SECTION

MINIMUM BEARING SURFACE AREA

(IN SQUARE FEET)

| SIZE OF PIPE | BENDS | | | | TEE OR DEAD END |
|---|---|---|---|---|---|
| | 11 1/4° | 22 1/2° | 45° | 90° | |
| 4" | 1.0 | 2.0 | 3.0 | 6.0 | 4.0 |
| 6" | 2.0 | 3.0 | 6.0 | 11.0 | 8.0 |
| 8" | 3.0 | 6.0 | 11.0 | 19.0 | 14.0 |
| 12" | 6.0 | 12.0 | 22.0 | 40.0 | 29.0 |
| 16" | 10.0 | 20.0 | 38.0 | 70.0 | 50.0 |
| 20" | 15.0 | 30.0 | 59.0 | 108.0 | 46.0 |
| 24" | 22.0 | 43.0 | 84.0 | 154.0 | 110.0 |

NOTES:

1. BEARING SURFACES SHOWN IN CHART ARE MINIMUM.
2. BEARING SURFACES ARE BASED ON 150 PSI INTERNAL PIPE \ PRESS PLUS WATER HAMMER.
   4", 6", 8" AND 12" WATER HAMMER = 110 PSI
   16", 20" AND 24" WATER HAMMER = 70 PSI
3. BEARING SURFACE CALCULATIONS ARE BASED ON 900 PSF SOIL BEARING CAPACITY.
4. ALL DUCTILE IRON AND CAST IRON PIPE AND FITTINGS SHALL BE WRAPPED IN POLYETHYLENE AND SECURELY TAPED PRIOR TO PLACING TRUST BLOCKS.
5. NO COMPACTION SHALL BE ALLOWED ABOVE THRUST BLOCKS FOR A MINIMUM OF 24 HOURS AFTER PLACEMENT. CONCRETE MUST CURE A MIN. OF 48 HOURS PRIOR TO FILLING LINES.

| DESIGN STANDARDS | STANDARD DRAWING |
|---|---|
| CONCRETE THRUST BLOCKS - BEARING SURFACES AND INSTALLATION | W3 |
| | DATE: 8/15/14 |

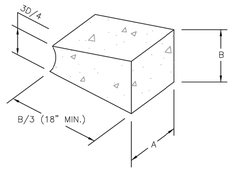
### MINIMUM DIMENSIONS FOR THRUST BLOCKS

| FITTING SIZE | TEES & PLUGS | | 90° BEND | | 45° BENDS & WYES | |
|---|---|---|---|---|---|---|
| | A | B | A | B | A | B |
| 4" | 1'-7" | 1'-2" | 1'-9" | 1'-6" | 1'-8" | 0'-10" |
| 6" | 2'-0" | 1'-11" | 2'-5" | 2'-2" | 1'-10" | 1'-7" |
| 8" | 2'-8" | 2'-6" | 3'-2" | 3'-0" | 2'-5" | 2'-1" |
| 10" | 3'-4" | 3'-3" | 4'-0" | 3'-10" | 3'-0" | 2'-9" |
| 12" | 4'-0" | 3'-10" | 4'-8" | 4'-8" | 3'-8" | 3'-3" |
| 14" | 5'-5" | 3'-10" | 6'-6" | 4'-11" | 4'-9" | 3'-5" |
| 20" | 5'-0" | 5'-0" | 6'-0" | 6'-0" | 5'-0" | 4'-0" |
| 24" | 6'-0" | 6'-0" | 7'-0" | 7'-0" | 5'-0" | 5'-0" |
| 30" | 7'-6" | 7'-6" | 8'-0" | 8'-0" | 6'-3" | 6'-3" |

| FITTING SIZE | REDUCERS & 22 1/2° BENDS | | 11 1/4° BENDS | |
|---|---|---|---|---|
| | A | B | A | B |
| 4" | 1'-7" | 0'-6" | 0'-6" | 0'-6" |
| 6" | 1'-9" | 0'-10" | 1'-0" | 0'-6" |
| 8" | 1'-9" | 1'-6" | 1'-0" | 1'-0" |
| 10" | 2'-2" | 1'-11" | 1'-6" | 1'-0" |
| 12" | 2'-7" | 2'-3" | 2'-0" | 1'-0" |
| 14" | 3'-5" | 2'-5" | 2'-0" | 1'-6" |
| 20" | 3'-6" | 3'-0" | 3'-0" | 2'-0" |
| 24" | 4'-6" | 3'-0" | 3'-0" | 3'-0" |
| 30" | 4'-9" | 4'-6" | 3'-3" | 3'-3" |

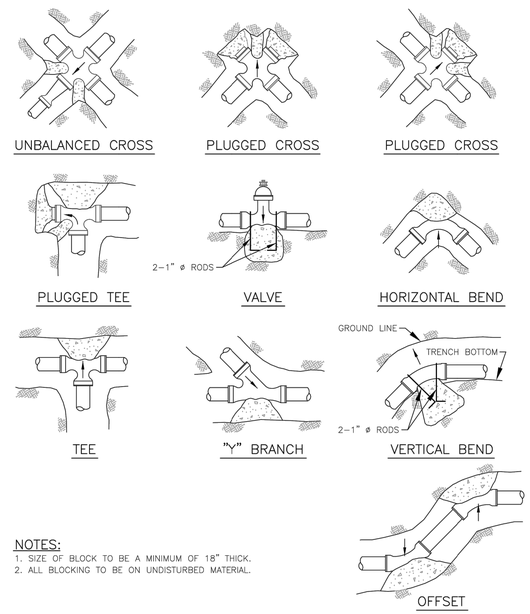
GENERAL NOTES:

1. BEARING SURFACE AREAS SHOWN IN CHART ARE MINIMUM.
2. BASED ON 150 P.S.I. INTERNAL PIPE PRESSURE.
3. SOIL BEARING CAPACITY = 2000 LB./SQ. FT.
4. ALL FITTINGS TO BE WRAPPED WITH POLYETHYLENE (MINIMUM 8 MIL.).




NOT TO SCALE

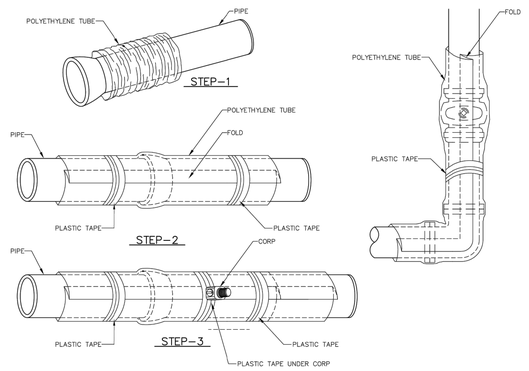
| DESIGN STANDARDS | STANDARD DRAWING |
|---|---|
| TYPICAL TRENCH BLOCK DIMENSIONS | W4 |
| | DATE: 8/15/14 |




NOTES:

1. SIZE OF BLOCK TO BE A MINIMUM OF 18" THICK.
2. ALL BLOCKING TO BE ON UNDISTURBED MATERIAL.

| DESIGN STANDARDS | STANDARD DRAWING |
|---|---|
| CONCRETE THRUST BLOCK FOR UNBALANCED SURFACES | W5 |
| | DATE: 8/15/14 |




FIELD INSTALLATION-POLYETHYLENE WRAP

STEP-1 PLACE TUBE OF POLYETHYLENE MATERIAL AROUND PIPE PRIOR TO LOWERING PIPE INTO TRENCH.

STEP-2 PULL THE TUBE OVER THE LENGTH OF THE PIPE. TAPE TUBE TO PIPE AT JOINT. FOLD MATERIAL AROUND THE ADJACENT SPIGOT END AND WRAP WITH TAPE TO HOLD THE PLASTIC TUBE IN PLACE.

STEP-3 OVERLAP FIRST TUBE WITH ADJACENT TUBE AND SECURE WITH PLASTIC ADHESIVE TAPE. THE POLYETHYLENE TUBE MATERIAL COVERING THE PIPE SHALL BE LOOSE. EXCESS MATERIAL SHALL BE NEATLY DRAWN UP AROUND THE PIPE BARREL, FOLDED ON TOP OF THE PIPE AND TAPED IN PLACE.

NOTE: POLYETHYLENE SHALL BE MINIMUM 8-MIL THICKNESS

| DESIGN STANDARDS | STANDARD DRAWING |
|---|---|
| POLYETHYLENE WRAP | W6 |
| | DATE: 8/15/14 |

UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, JR ENGINEERING APPROVES THEIR USE ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

PREPARED FOR
LUPTON LAND, LLC
10221 PRESTWICK TRAIL
LONE TREE, CO 80124
BOB QUINETTE
P-303.587.1966

J·R ENGINEERING
A Westrian Company
Centennial 303-740-9393 • Colorado Springs 719-593-2593
Fort Collins 970-491-9888 • www.jrengineering.com

| No. | REVISION | BY | DATE |
|---|---|---|---|

| | |
|---|---|
| H-SCALE | N/A |
| V-SCALE | N/A |
| DATE | 12/13/21 |
| DESIGNED BY | N/A |
| DRAWN BY | SWW |
| CHECKED BY | |

COYOTE CREEK FILING NO 4

DETAILS

Know what's below. Call before you dig.

## ENGINEER'S STATEMENT

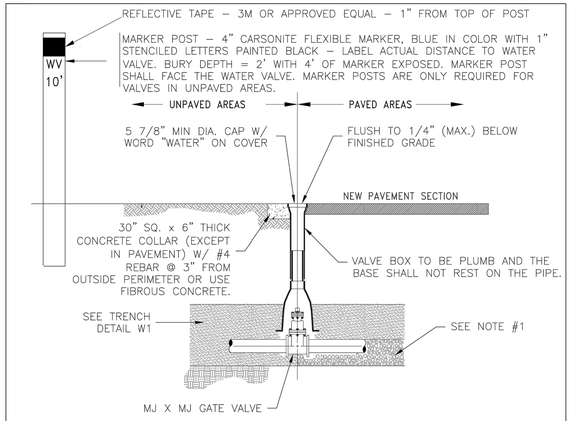
STANDARD DETAILS SHOWN WERE REVIEWED ONLY AS TO THEIR APPLICATION ON THIS PROJECT.

ANDREW J. HUGILL, PE
COLORADO LIC. PE NO. 57007
FOR AND ON BEHALF OF JR ENGINEERING, LLC.

DATE

SHEET 28 OF 46

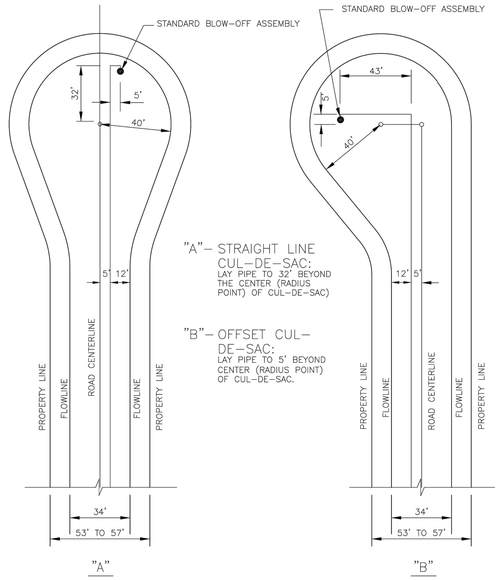
JOB NO. 16093.00




NOTES:

1. CARE SHALL BE TAKEN WHEN INSTALLING VALVES TO ASSURE PROPER SUPPORT OF THE VALVE. THE CITY ENGINEER MAY REQUIRE 3/4" CRUSHED ROCK TO BE INSTALLED UNDER THE VALVE TO PROVIDE PROPER SUPPORT.
2. VALVES SHALL NOT BE PLACED IN CONCRETE SIDEWALKS, CROSS PANS, GUTTERS, OR OTHER DRAINAGE WAYS.
3. OPERATING NUTS OR EXTENSIONS SHALL NOT BE SET CLOSER THAN TWO (2) FEET FROM FINAL GRADE. IF THE OPERATING NUT IS DEEPER THAN FIVE (5) FEET FROM FINAL GRADE, PROVIDE A 1 1/4" EXTENSION SHAFT W/ CENTERING RING. OPERATOR EXTENSIONS SHALL BE CONNECTED TO THE VALVE OPERATOR NUT USING A PIN. THE EXTENSION SHAFT SHALL INCLUDE A 1/4" THICK TRASH RING LOCATED 6" BELOW THE NON-RISING PORTION OF THE VALVE BOX. THE DIAMETER OF THE TRASH RING SHALL BE 1/8" LESS THAN THE INSIDE DIAMETER OF THE VALVE BOX.
4. GATE VALVE SHALL BE POLYETHYLENE WRAPPED (8 MIL).
5. CONCRETE COLLARS & MARKER POSTS ARE REQUIRED WHEN VALVE IS LOCATED IN AN UNPAVED AREA.
6. VALVE BOXES ARE TO BE BROUGHT UP TO GRADE AT THE TIME OF PAVEMENT PLACEMENT OR OVERLAY. VALVE BOX ADJUSTING RINGS ARE NOT ALLOWED.

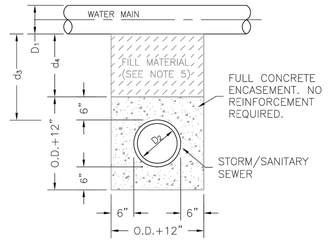
| DESIGN STANDARDS | STANDARD DRAWING |
|---|---|
| VALVE BOX | W1 |
| | DATE: 8/15/14 |




"A"– STRAIGHT LINE CUL–DE–SAC: LAY PIPE TO 32' BEYOND THE CENTER (RADIUS POINT) OF CUL–DE–SAC)

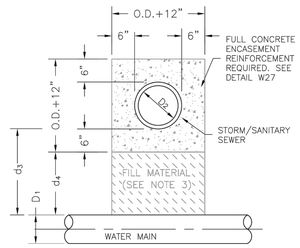
"B"– OFFSET CUL–DE–SAC: LAY PIPE TO 5' BEYOND CENTER (RADIUS POINT) OF CUL–DE–SAC.

| DESIGN STANDARDS | STANDARD DRAWING |
|---|---|
| WATER DISTRIBUTION SYSTEM TYPICAL PLAN FOR CUL-DE-SAC | W21 |
| | DATE: 8/15/14 |




STORM OR SANITARY SEWER CROSSING UNDER WATER MAIN

IF $d_3$ >18" AN ENCASEMENT IS NOT REQUIRED



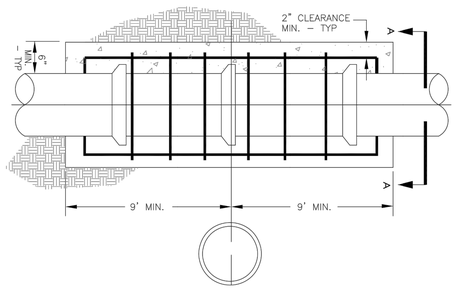

NOTES:

1. CONCRETE TO BE CAST AGAINST UNDISTURBED SOIL OR SHORING.
2. LENGTH OF ENCASEMENT SHALL EXTEND AT LEAST 9–FEET EACH SIDE OF WATER MAIN.
3. FILLER MATERIAL BETWEEN CONDUITS TO BE APPROVED COMPRESSIBLE MATERIAL SUCH AS STYROFOAM, ETC. IF $d_4 \leq 6$". COMPACTED BACKFILL, IF $d_4 > 6$".
4. SHORING OR SHEETING, IF USED, TO BE CUT OFF AT TOP OF ENCASEMENT
5. A REINFORCED ENCASEMENT IS REQUIRED FOR ALL CONDUITS CROSSING OVER WATERMAINS BUT ENCASEMENTS ARE NOT REQUIRED TO BE REINFORCED IF CROSSING UNDER WATERMAINS.

STORM OR SANITARY SEWER CROSSING OVER TOP OF WATER MAIN

REINFORCED ENCASEMENT REQUIRED REGARDLESS OF DIMENSION $d_3$

| DESIGN STANDARDS | STANDARD DRAWING |
|---|---|
| ENCASEMENT FOR CONDUIT CROSSING | W26 |
| | DATE: 8/15/14 |




| PIPE I.D. | NO. OF LONGITUDINAL BARS & LOCATION |
|---|---|
| 6" TO 8" | 4 – #4 BARS 1 EACH CORNER |
| 10" TO 18" | 8 – #4 BARS 3 EACH SIDE |
| 21" TO 33" | 12 – #4 BARS 4 EACH SIDE |
| 36" | 16 – #4 BARS 5 EACH SIDE |

| DESIGN STANDARDS | STANDARD DRAWING |
|---|---|
| CONCRETE ENCASEMENT REINFORCEMENT DETAIL | W27 |
| | DATE: 8/15/14 |

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## ENGINEER'S STATEMENT

STANDARD DETAILS SHOWN WERE REVIEWED ONLY AS TO THEIR APPLICATION ON THIS PROJECT.

ANDREW J. HUGILL, PE
COLORADO LIC. PE NO. 57007
FOR AND ON BEHALF OF JR ENGINEERING, LLC.

DATE

UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, JR ENGINEERING APPROVES THEIR USE ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

PREPARED FOR
LUPTON LAND, LLC
10221 PRESTWICK TRAIL
LONE TREE, CO 80124
BOB QUINETTE
P–303.587.1966

J·R ENGINEERING
A Westrian Company
Centennial 303-740-9393 • Colorado Springs 719-593-2593
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| No. | REVISION | BY | DATE |
|---|---|---|---|
| | | | |

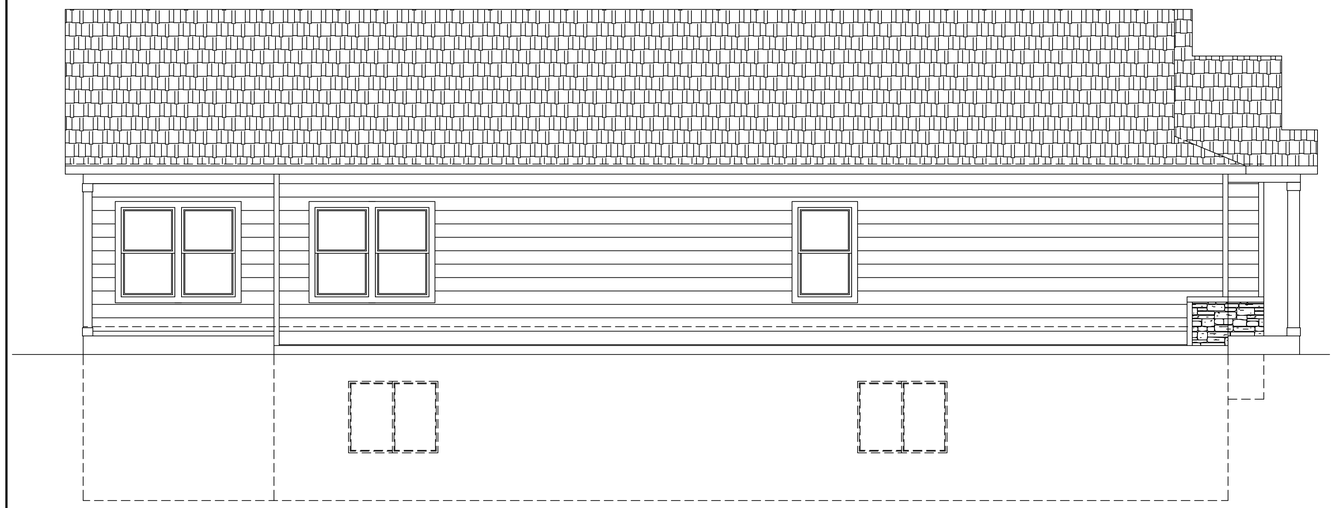
| | |
|---|---|
| H-SCALE | N/A |
| V-SCALE | N/A |
| DATE | 12/13/21 |
| DESIGNED BY | N/A |
| DRAWN BY | SWW |
| CHECKED BY | |

COYOTE CREEK FILING NO 4

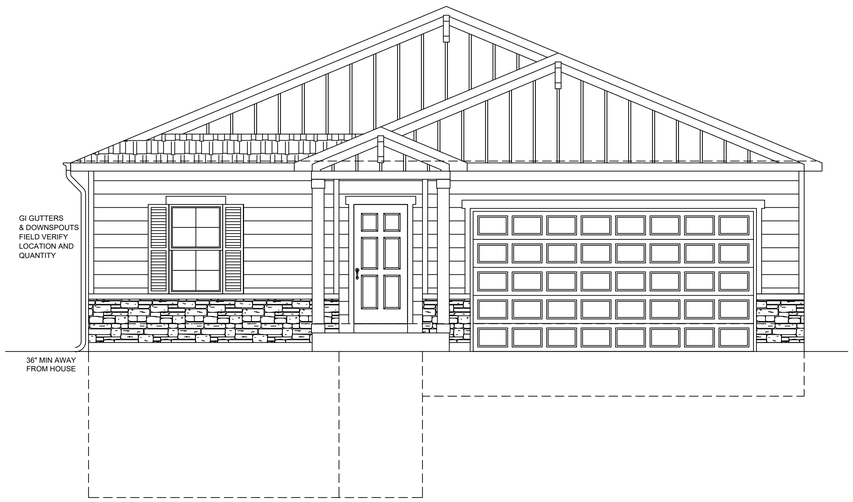
DETAILS

SHEET 29 OF 46

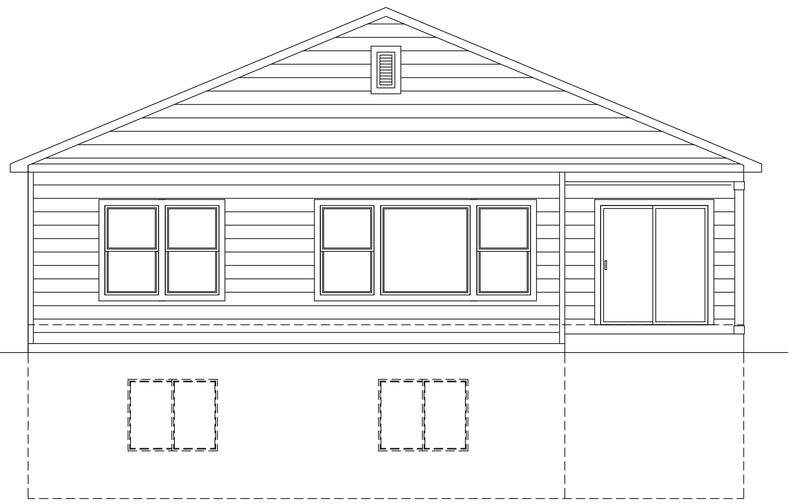
JOB NO. 16093.00



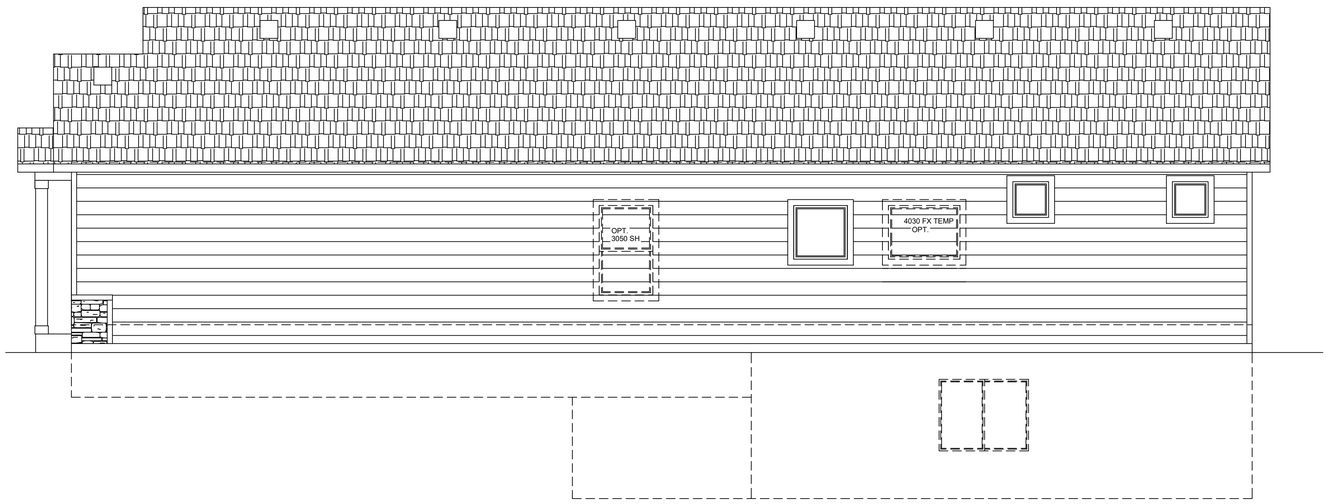
SIDE ELEVATION
1/4"=1'-0"




D1812.1 FRONT ELEVATION-TRADITIONAL
1/4"=1'-0"



REAR ELEVATION
1/4"=1'-0"




GARAGE SIDE ELEVATION
1/4"=1'-0"

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8605 EXPLORER DRIVE
SUITE 250
COLORADO SPRINGS, CO 80920
719-598-5192

SHEET NAME
ELEVATION- TRADITIONAL

PROJECT NAME
MASTER PLAN D1813.1

STAMPS/ENDORSEMENTS

DRAWN BY:
AL

DATE:
8/27/18

SUBMITTALS / REVISIONS

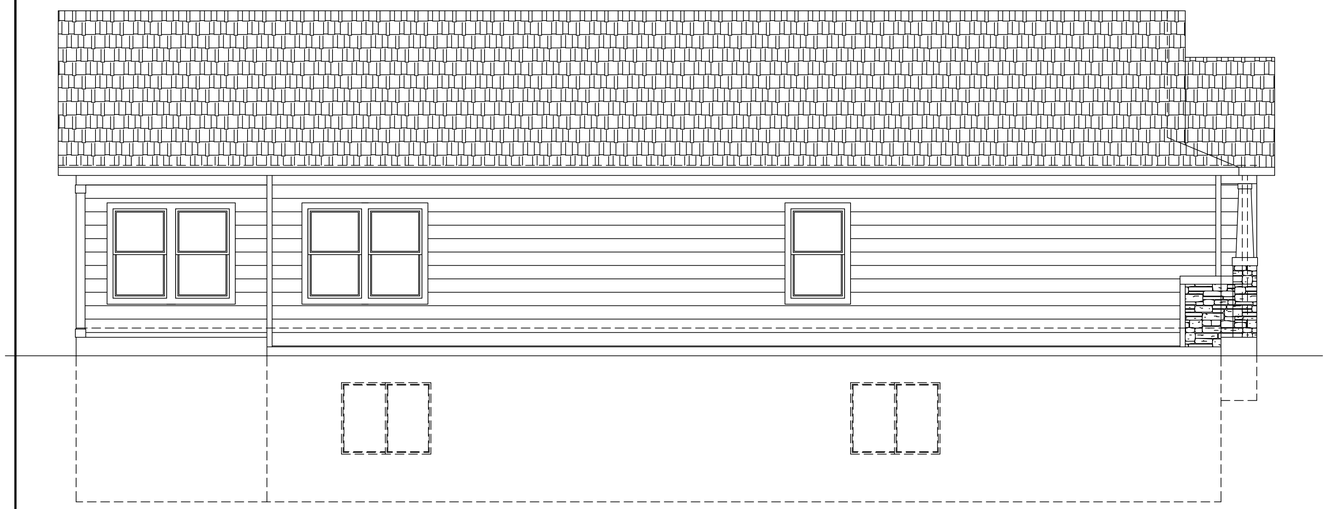
| DATE | TYPE | BY |
|---|---|---|
| | | |

SUBMITTALS / REVISIONS

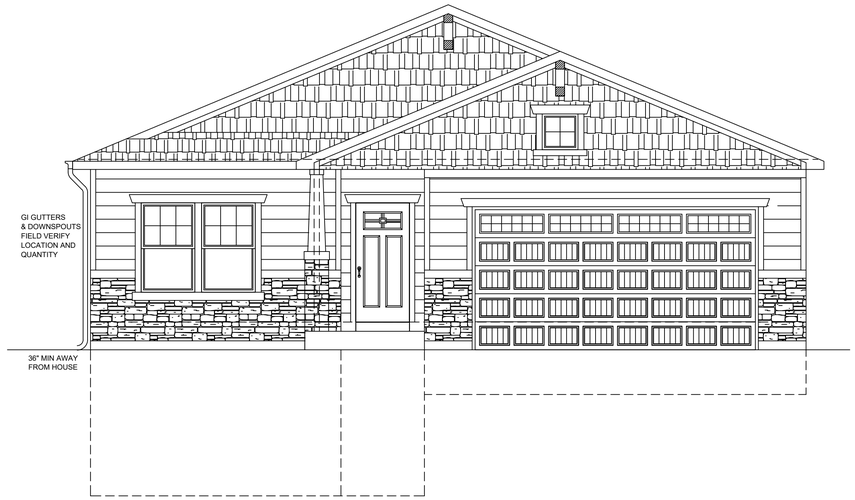
| DATE | TYPE | BY |
|---|---|---|
| | | |

ELEVATION TRAD

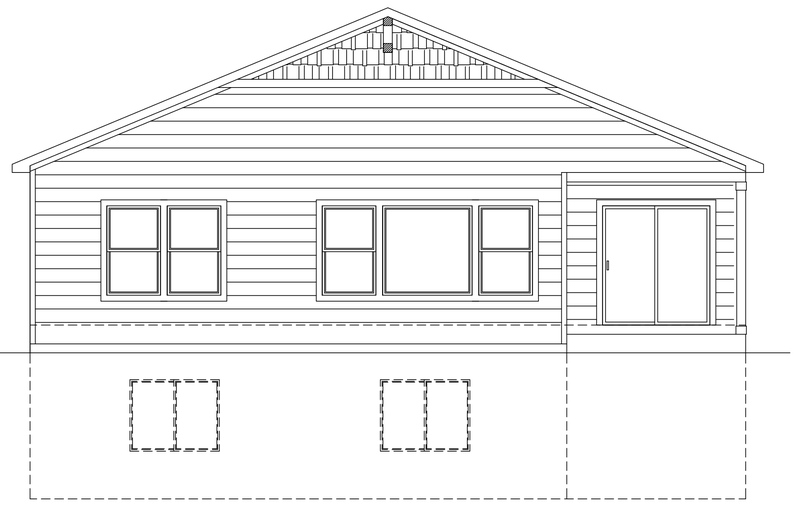
SHEET NUMBER
30



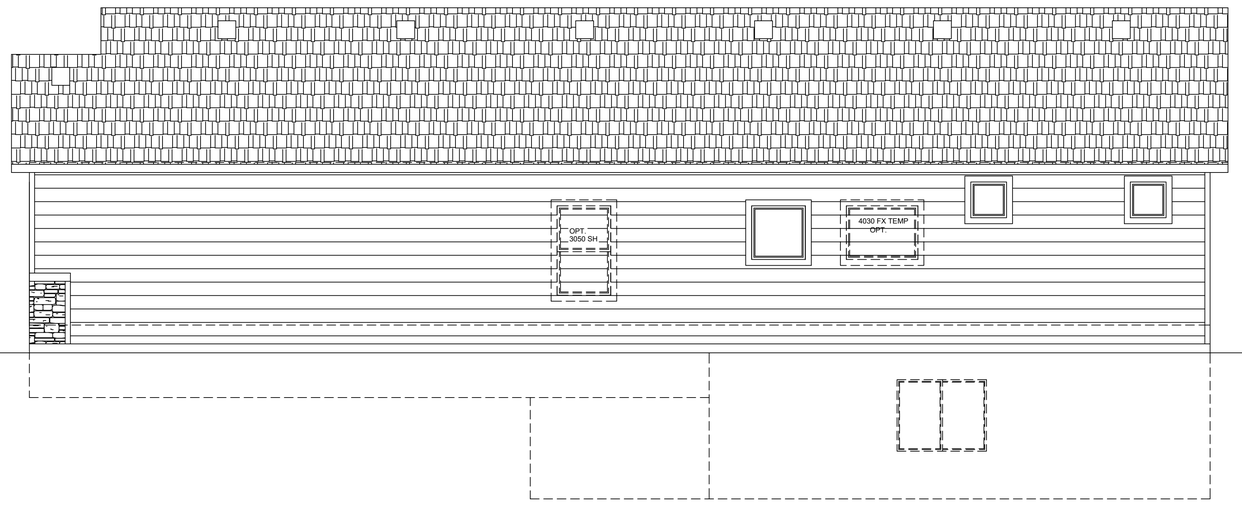
SIDE ELEVATION
1/4"=1'-0"




D1813.1 FRONT ELEVATION- CRAFTSMAN
1/4"=1'-0"



REAR ELEVATION
1/4"=1'-0"




GARAGE SIDE ELEVATION
1/4"=1'-0"

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CHALLENGER BUILDING, LLC.
8605 EXPLORER DRIVE
SUITE 250
COLORADO SPRINGS, CO 80920
719-598-5192

SHEET NAME
ELEVATION- CRAFTSMAN

PROJECT NAME
MASTER PLAN D1813.1

STAMPS/ENDORSEMENTS

DRAWN BY:
AL

DATE:
8/27/18

SUBMITTALS / REVISIONS

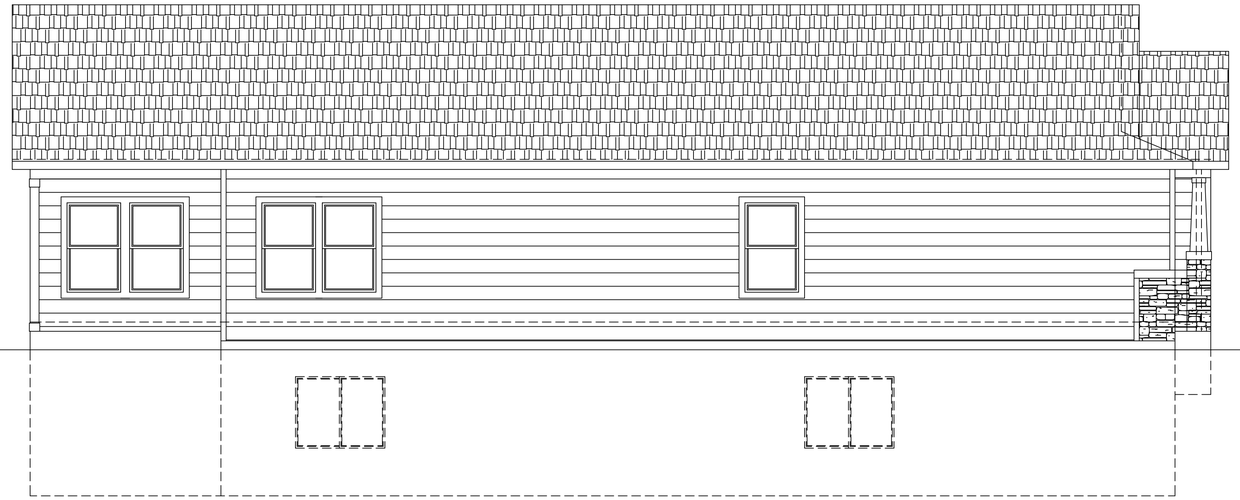
| DATE | TYPE | BY |
|---|---|---|
| | | |

SUBMITTALS / REVISIONS

| DATE | TYPE | BY |
|---|---|---|
| | | |

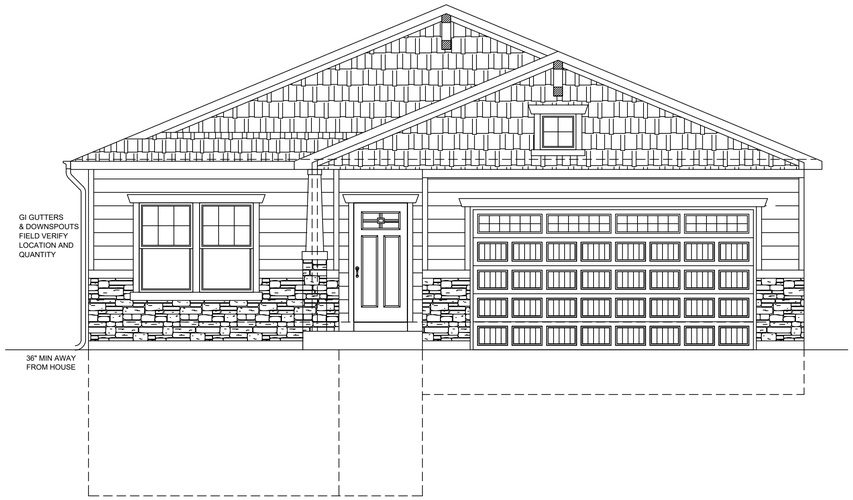
ELEVATION CRAFT.

SHEET NUMBER
31



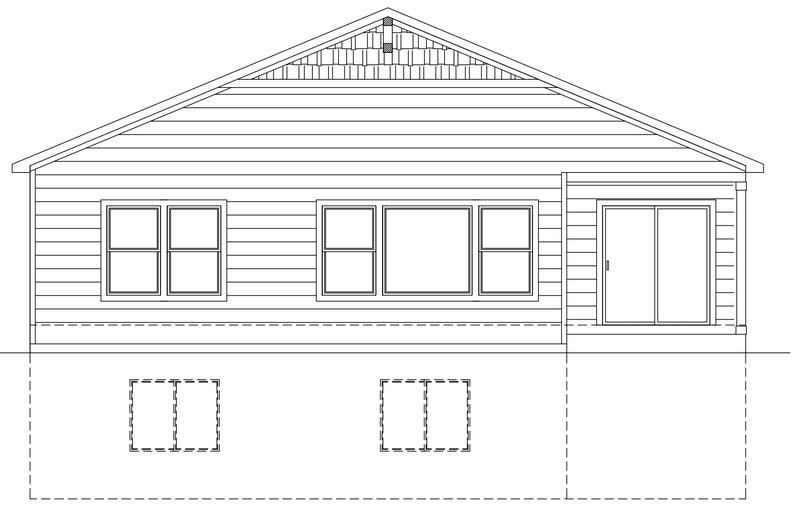
SIDE ELEVATION

1/4"=1'-0"



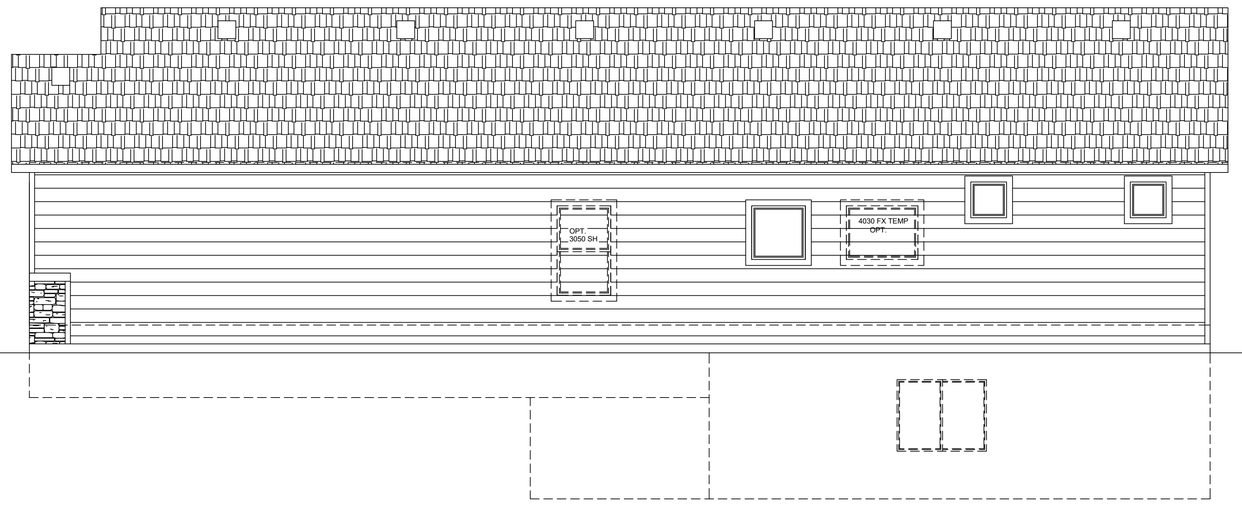

D1813.1 FRONT ELEVATION- CRAFTSMAN

1/4"=1'-0"



REAR ELEVATION

1/4"=1'-0"




GARAGE SIDE ELEVATION

1/4"=1'-0"

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8605 EXPLORER DRIVE
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719-598-5192

SHEET NAME
ELEVATION- CRAFTSMAN

PROJECT NAME
MASTER PLAN D1813.1

STAMPS/ENDORSEMENTS

DRAWN BY:
AL

DATE:
8/27/18

SUBMITTALS / REVISIONS

| DATE | TYPE | BY |
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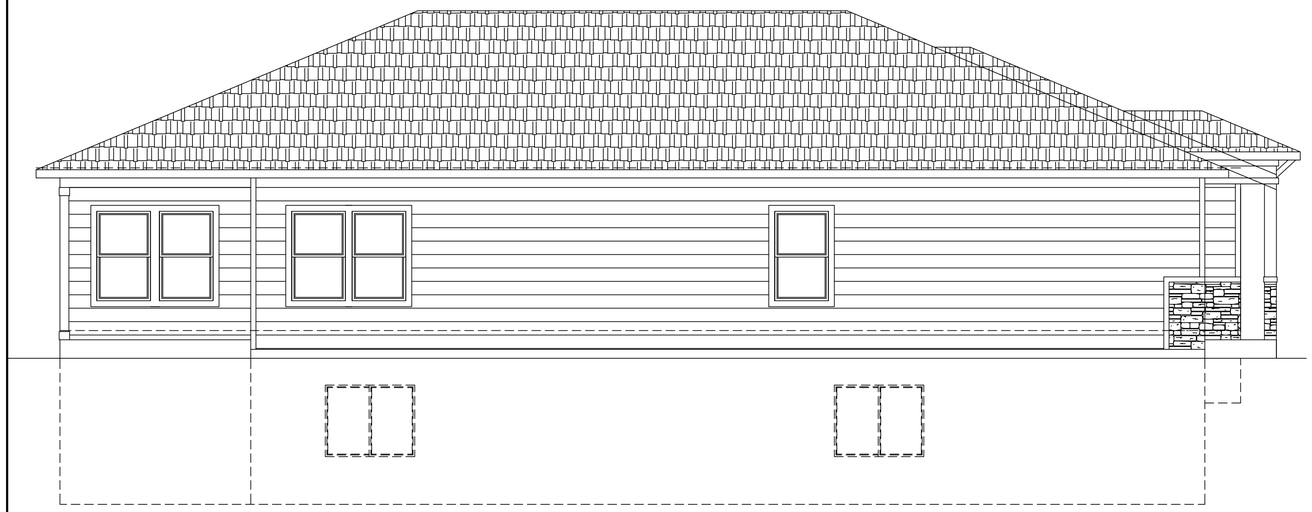
SUBMITTALS / REVISIONS

| DATE | TYPE | BY |
|---|---|---|

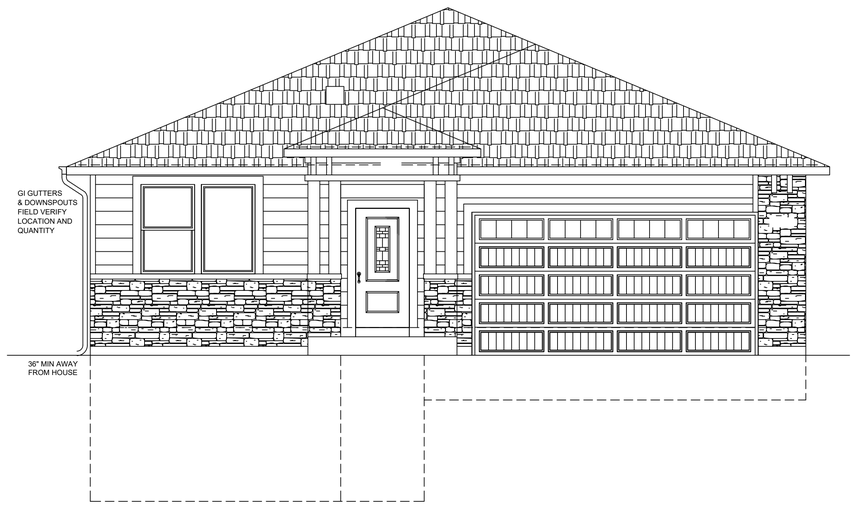
ELEVATION CRAFT.

SHEET NUMBER
32



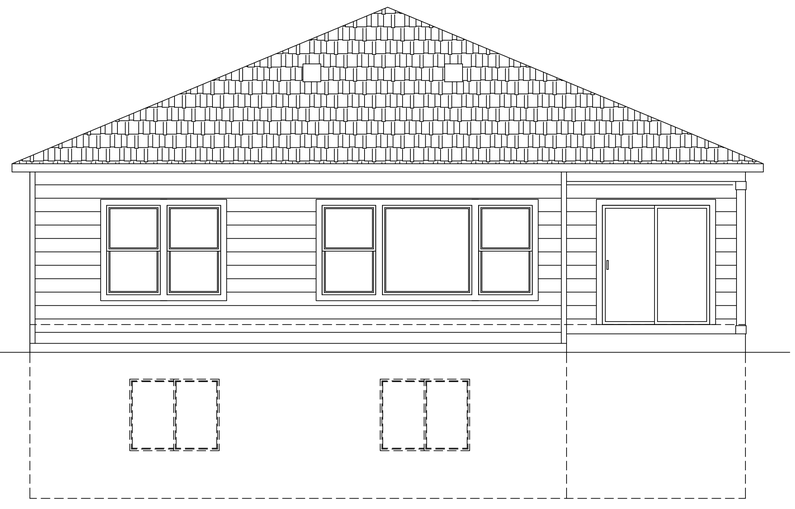
SIDE ELEVATION

1/4"=1'-0"



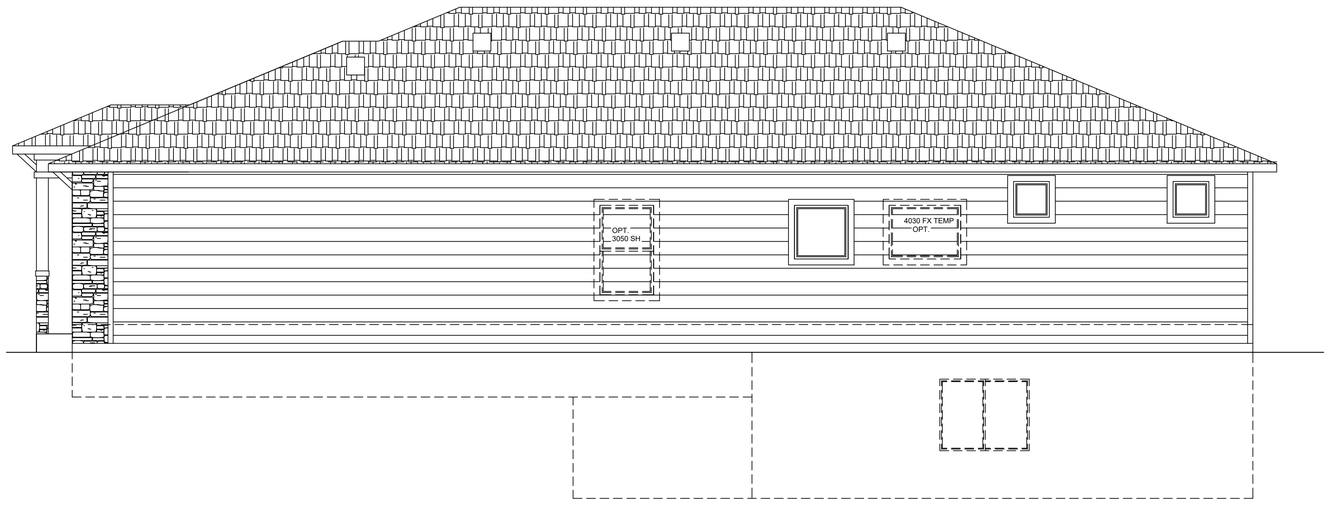

D1813.1 FRONT ELEVATION- MODERN PRAIRIE

1/4"=1'-0"



REAR ELEVATION

1/4"=1'-0"




GARAGE SIDE ELEVATION

1/4"=1'-0"

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SHEET NAME
ELEVATION- MODERN PRAIRIE

PROJECT NAME
MASTER PLAN D1813.1

STAMPS/ENDORSEMENTS

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SUBMITTALS / REVISIONS

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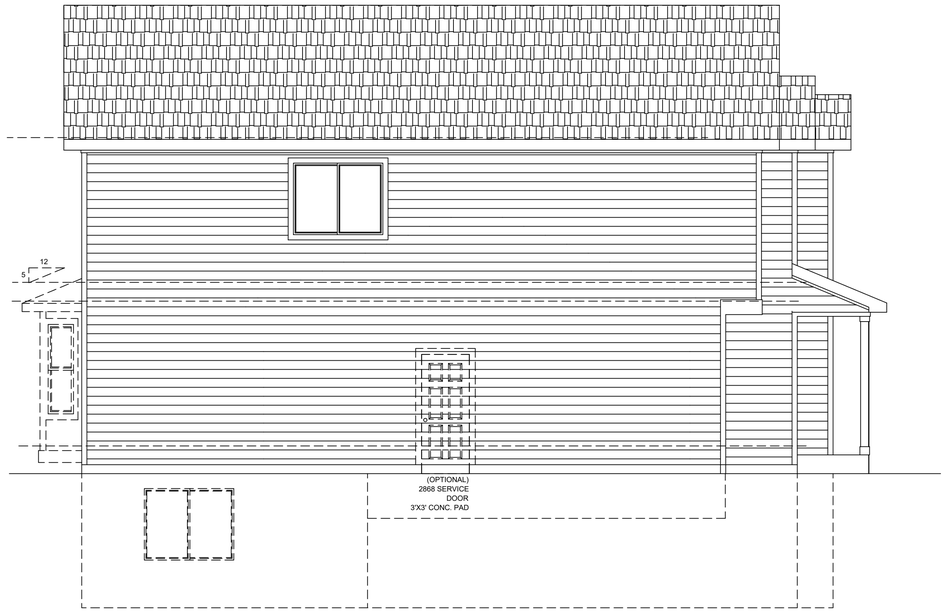
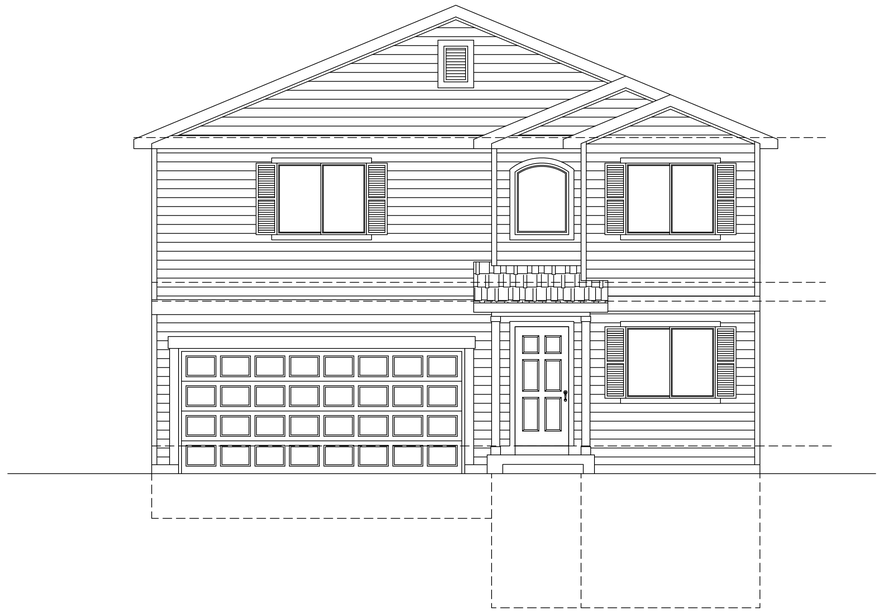
|---|---|---|
| | | |

ELEVATION MOD. PR.

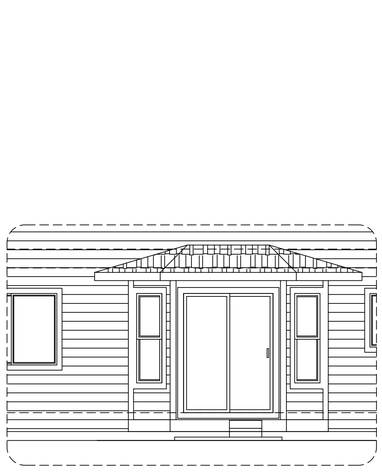
SHEET NUMBER
33



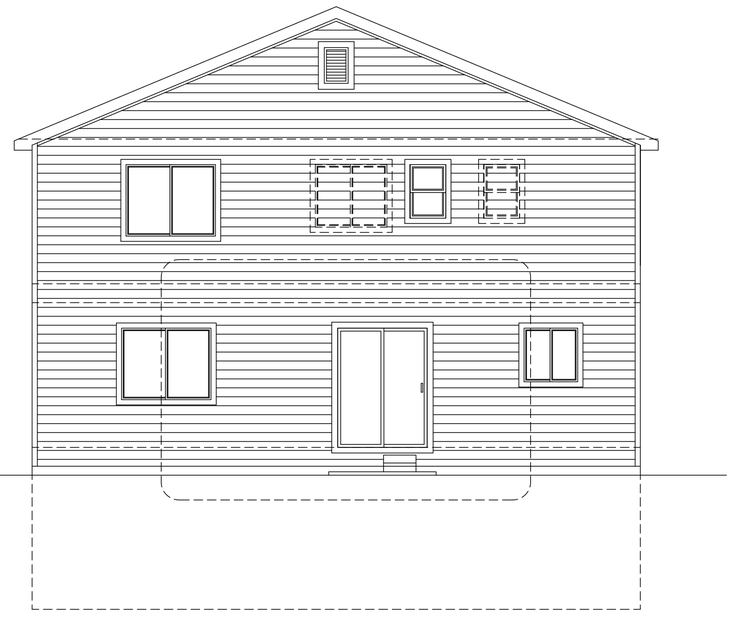

GARAGE SIDE ELEVATION "A"
1/4"=1'-0"



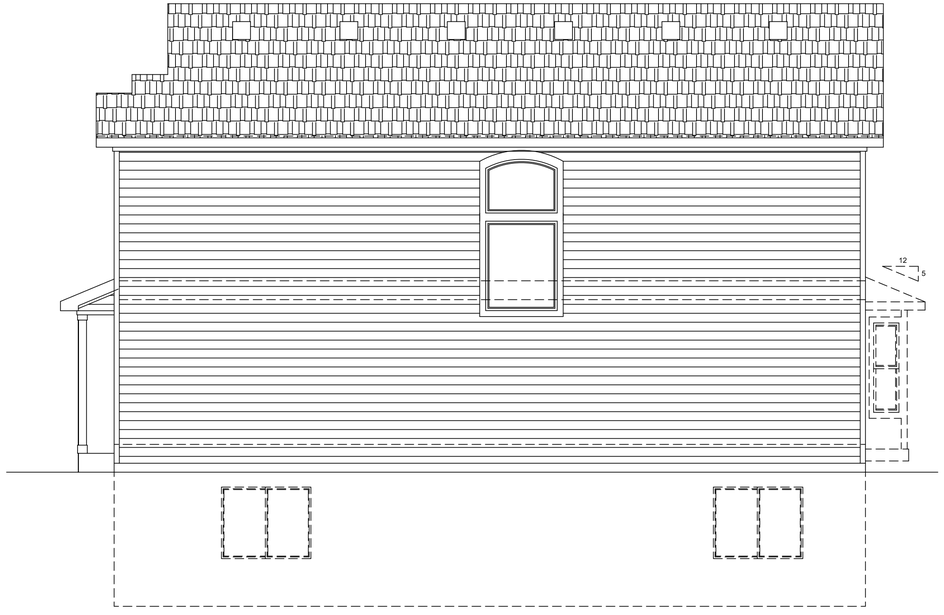
D2146.7 FRONT ELEVATION "A"
1/4"=1'-0"



OPT BAY AT DINING
1/4"=1'-0"



REAR ELEVATION "A"
1/4"=1'-0"




SIDE ELEVATION "A"
1/4"=1'-0"

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SHEET NAME
ELEVATION- "A"

PROJECT NAME
MASTER PLAN D2146.7

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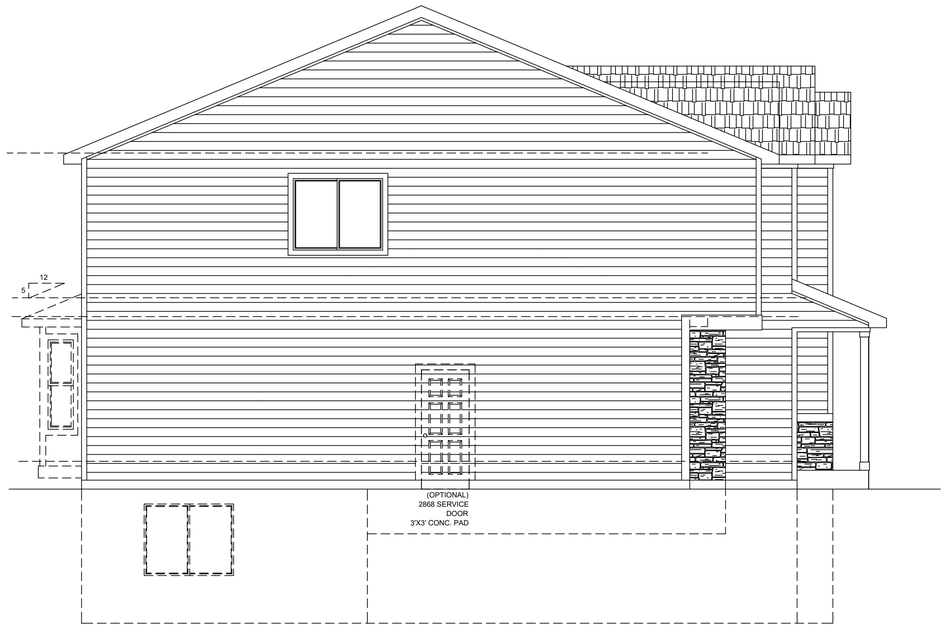
| BY | TYPE | DATE |
|---|---|---|
| | | |

SUBMITTALS / REVISIONS

| BY | TYPE | DATE |
|---|---|---|
| | | |

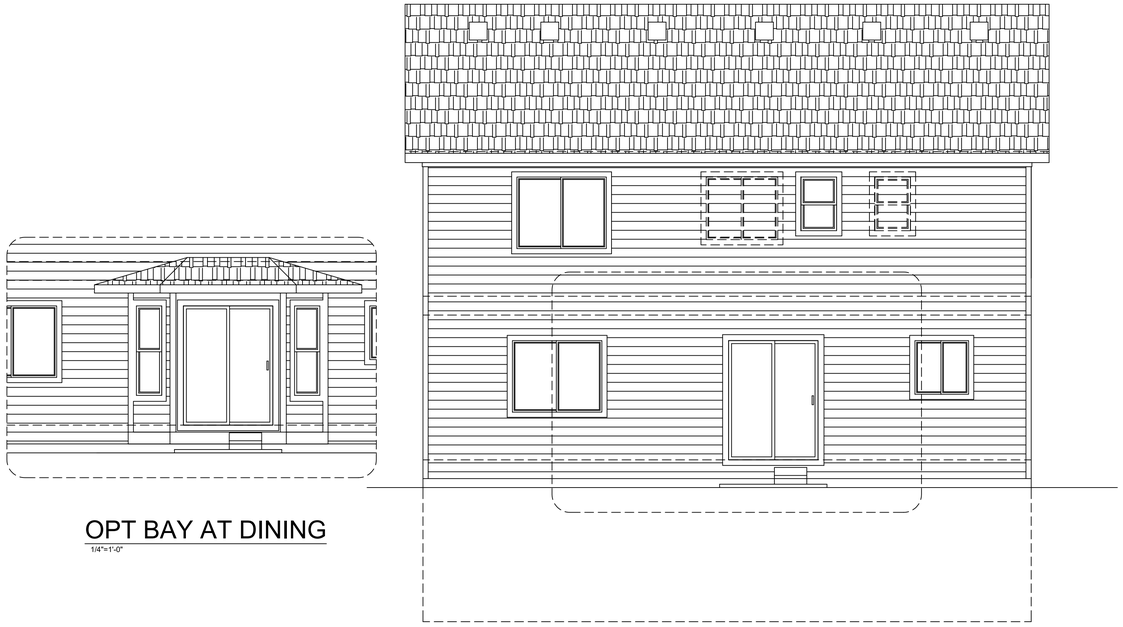
ELEVATION ELEV "A"

SHEET NUMBER
34



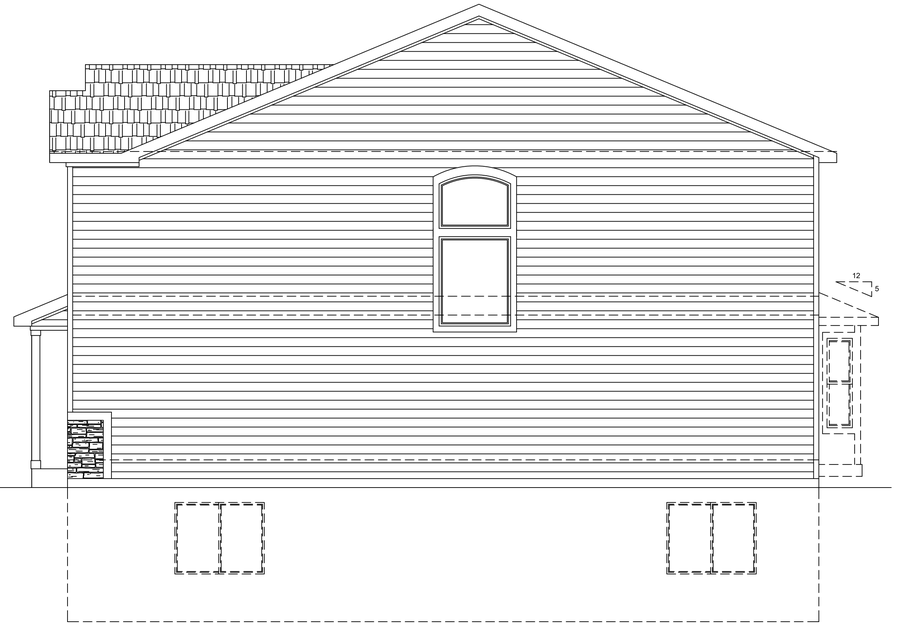

GARAGE SIDE ELEVATION "C"
1/4"=1'-0"

D2146.7 FRONT ELEVATION "C"
1/4"=1'-0"



OPT BAY AT DINING
1/4"=1'-0"

REAR ELEVATION "C"
1/4"=1'-0"




SIDE ELEVATION "C"
1/4"=1'-0"

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SHEET NAME
ELEVATION- "C"

PROJECT NAME
MASTER PLAN D2146.7

STAMPS/ENDORSEMENTS

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|---|---|---|
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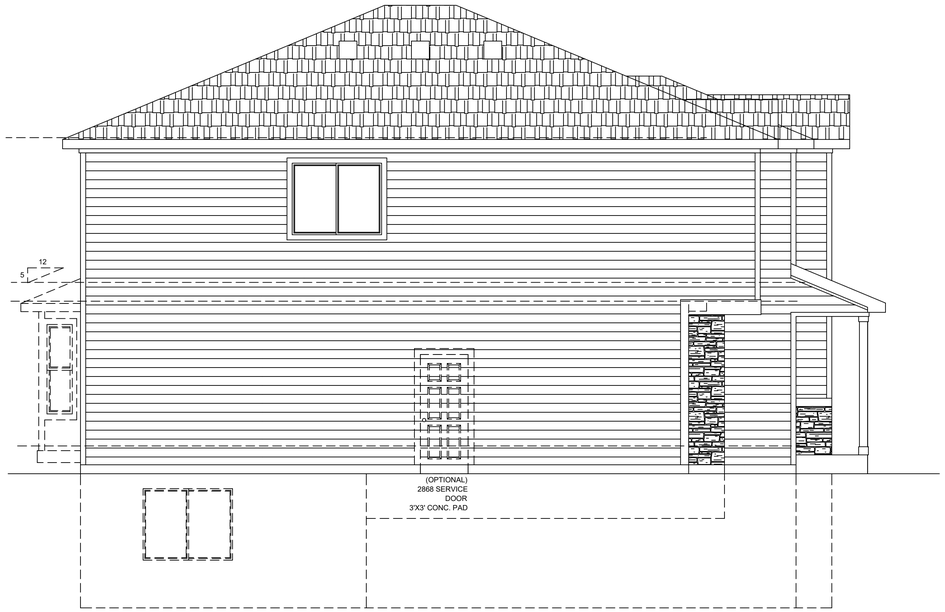
SUBMITTALS / REVISIONS

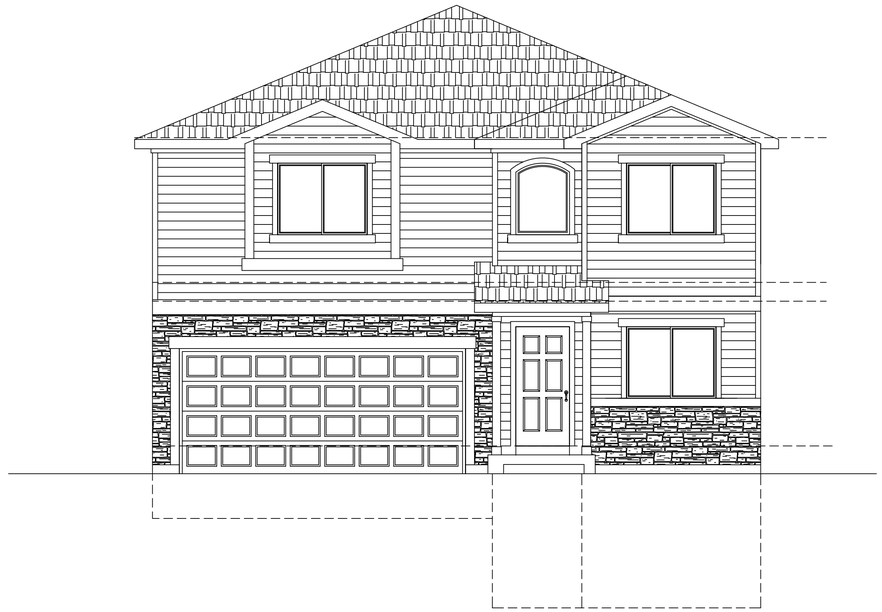
| BY | TYPE | DATE |
|---|---|---|
| | | |

ELEVATION ELEV "C"

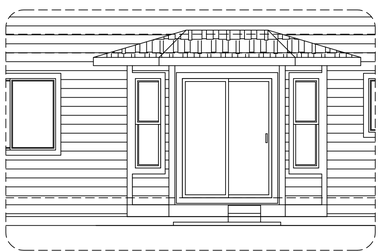
SHEET NUMBER
35



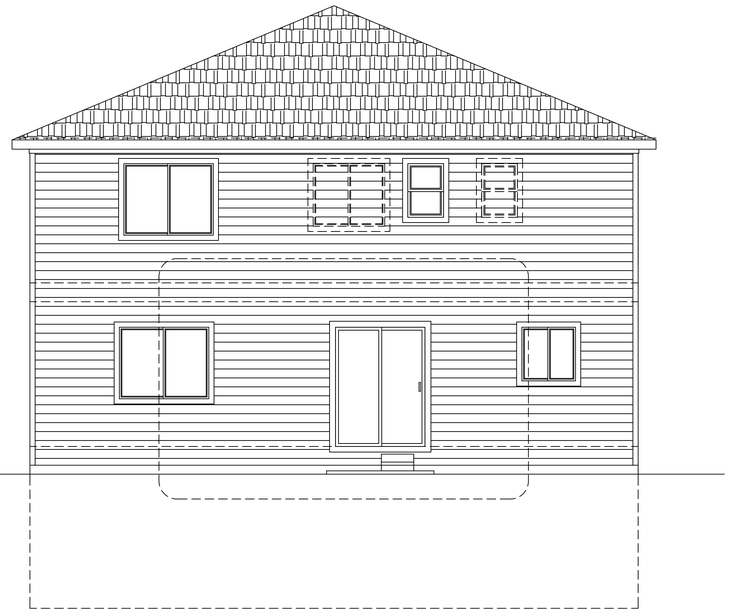

GARAGE SIDE ELEVATION "D"
1/4"=1'-0"



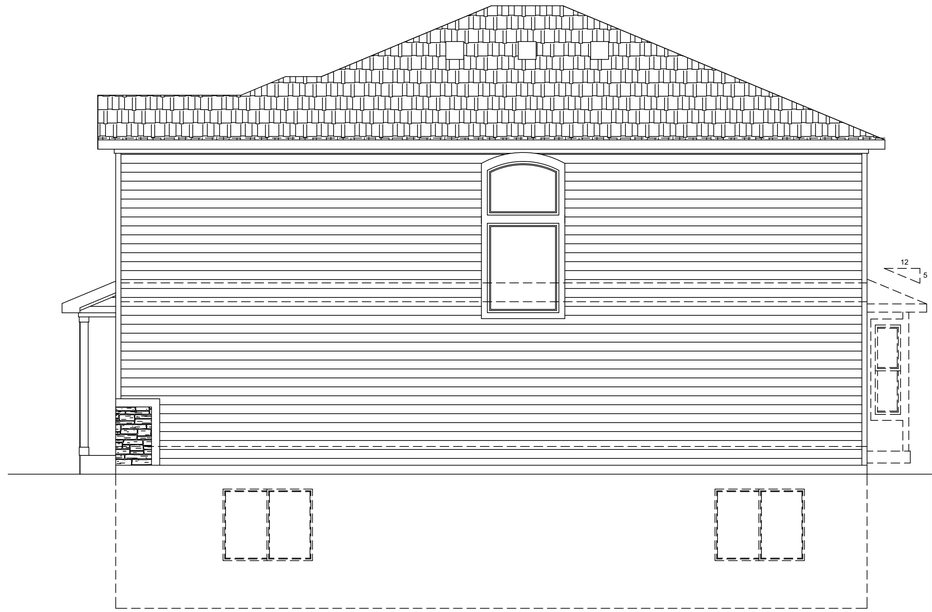
D2146.7 FRONT ELEVATION "D"
1/4"=1'-0"



OPT BAY AT DINING
1/4"=1'-0"



REAR ELEVATION "D"
1/4"=1'-0"




SIDE ELEVATION "D"
1/4"=1'-0"

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ELEVATION- "D"

PROJECT NAME
MASTER PLAN D2146.7

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|---|---|---|
| | | |

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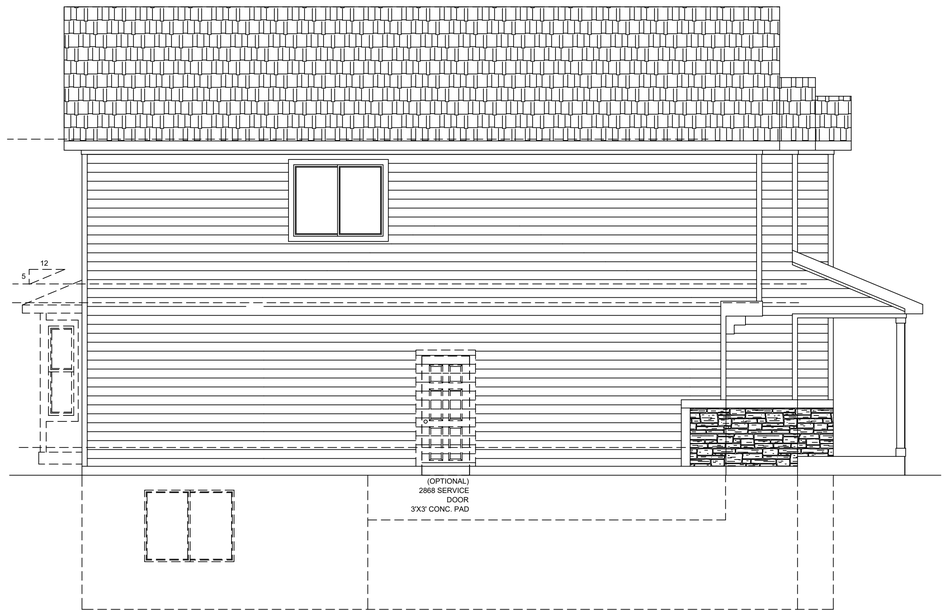
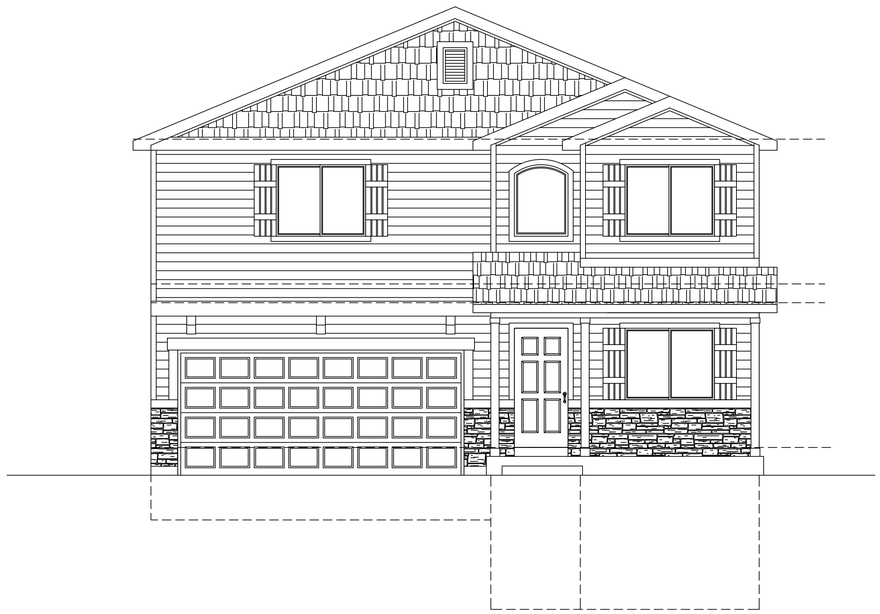
| BY | TYPE | DATE |
|---|---|---|
| | | |

ELEVATION ELEV "D"

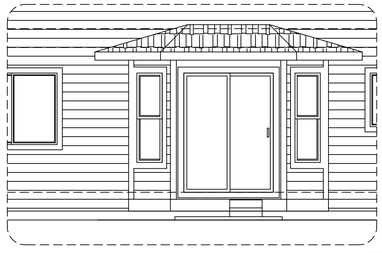
SHEET NUMBER
36



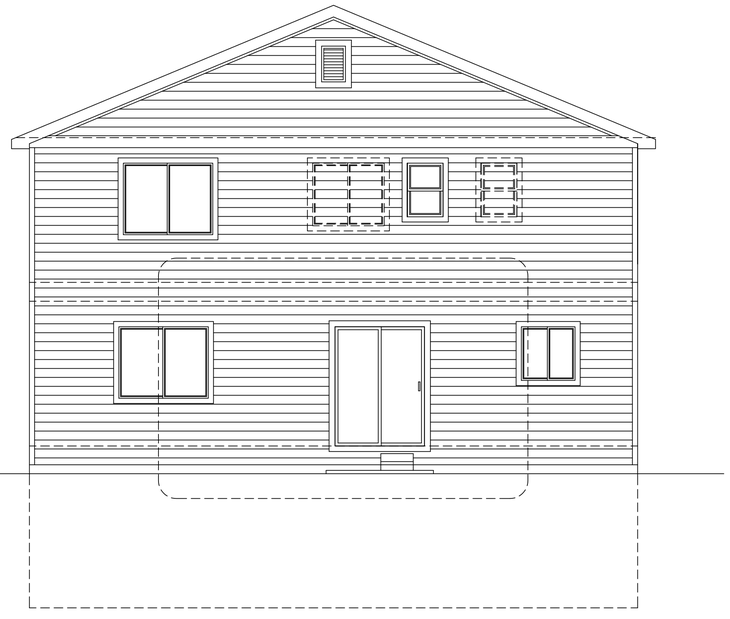

GARAGE SIDE ELEVATION "E"
1/4"=1'-0"



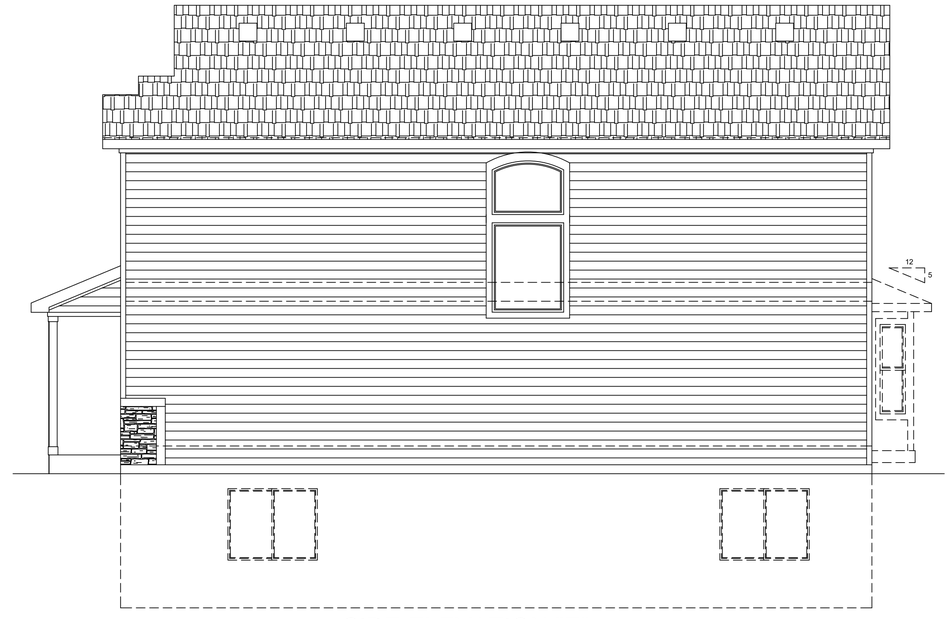
D2146.7 FRONT ELEVATION "E"
1/4"=1'-0"



OPT BAY AT DINING
1/4"=1'-0"



REAR ELEVATION "E"
1/4"=1'-0"




SIDE ELEVATION "E"
1/4"=1'-0"

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SHEET NAME
ELEVATION- "E"

PROJECT NAME
MASTER PLAN D2146.7

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SUBMITTALS / REVISIONS

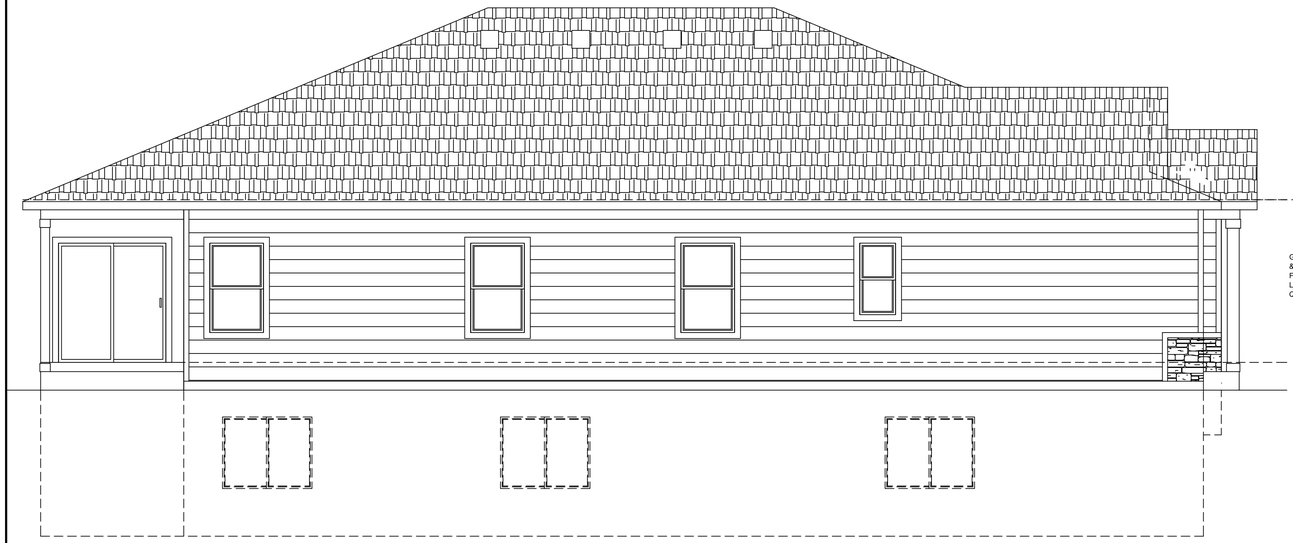
| BY | TYPE | DATE |
|---|---|---|
| | | |

SUBMITTALS / REVISIONS

| BY | TYPE | DATE |
|---|---|---|
| | | |

ELEVATION ELEV "E"

SHEET NUMBER
37

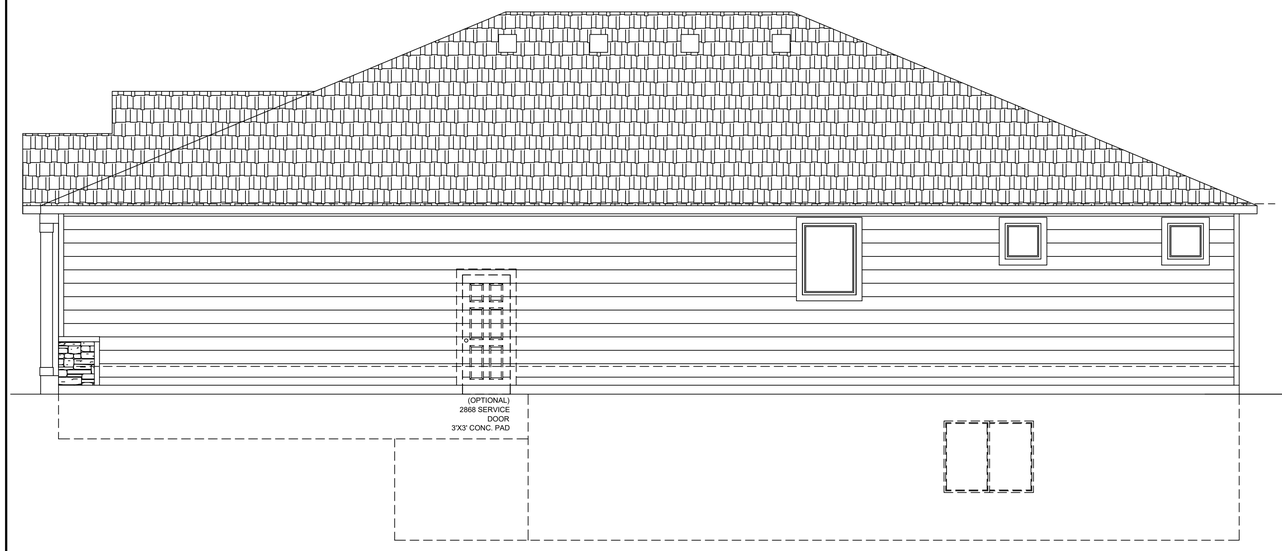


D2357.1 SIDE ELEVATION- TRADITIONAL

1/4"=1'-0"

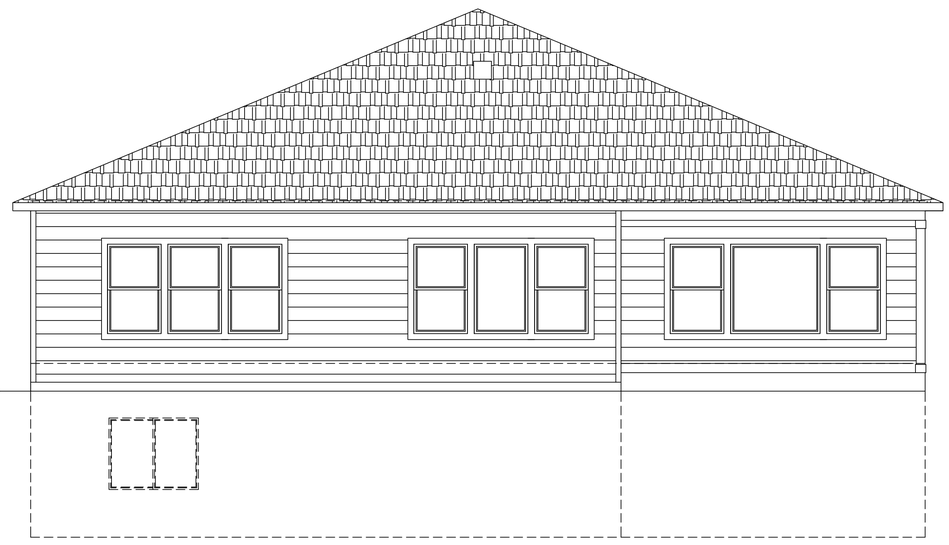
D2357.1 FRONT ELEVATION-TRADITIONAL

1/4"=1'-0"




GARAGE SIDE ELEVATION- TRADITIONAL

1/4"=1'-0"



REAR ELEVATION- TRADITIONAL

1/4"=1'-0"

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SHEET NAME
ELEVATION- TRADITIONAL

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|---|---|---|
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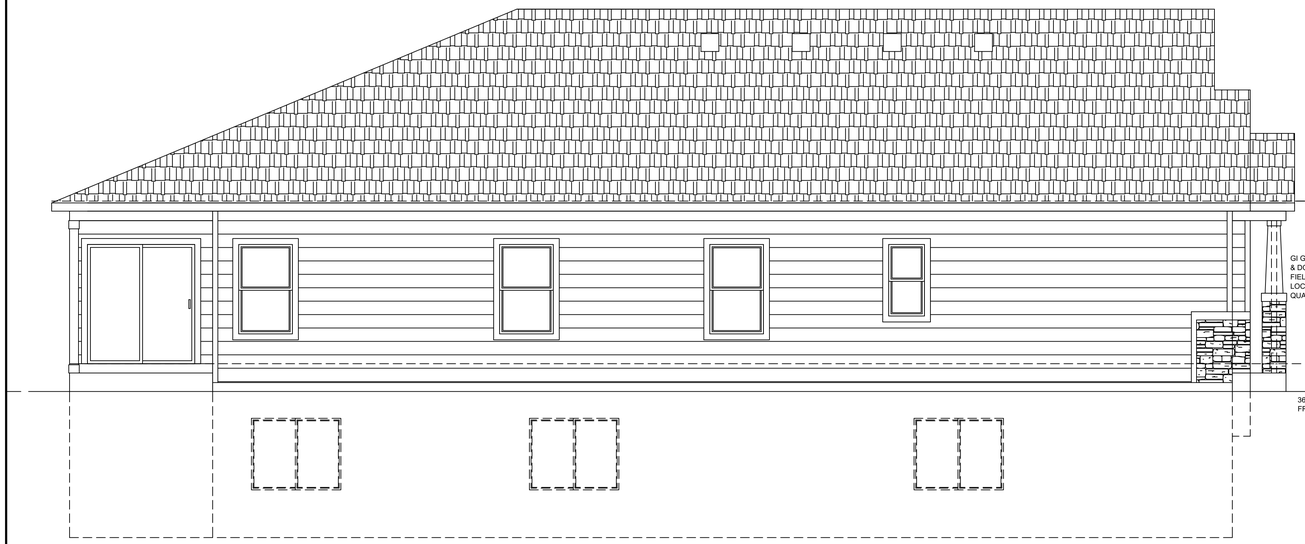
SUBMITTALS / REVISIONS

| BY | TYPE | DATE |
|---|---|---|
| | | |

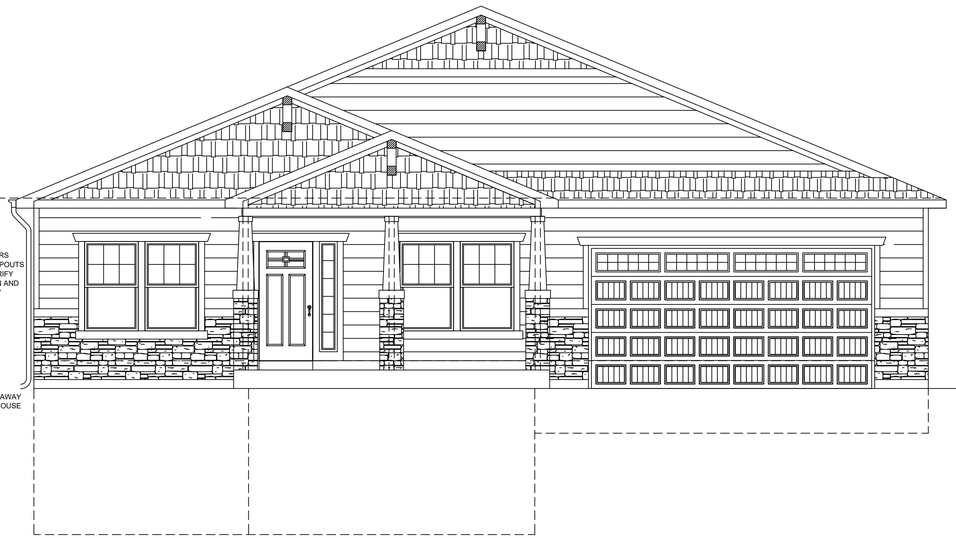
ELEVATION TRAD.

SHEET NUMBER
38



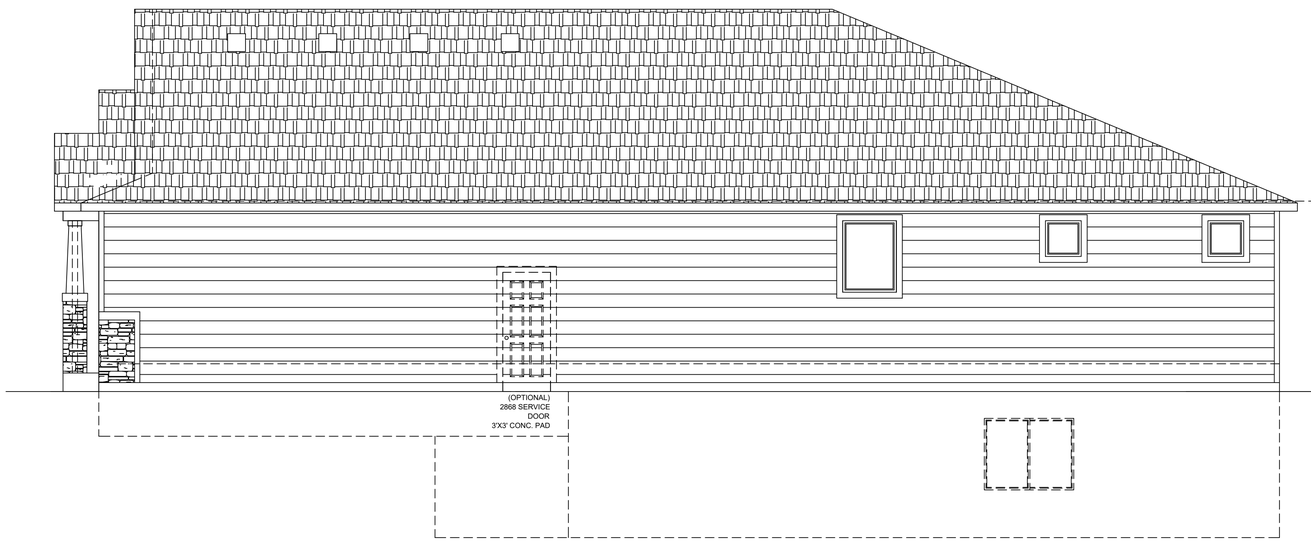

D2357.1 SIDE ELEVATION- CRAFTSMAN

1/4"=1'-0"



D2357.1 FRONT ELEVATION-CRAFTSMAN

1/4"=1'-0"




GARAGE SIDE ELEVATION- CRAFTSMAN

1/4"=1'-0"

REAR ELEVATION- CRAFTSMAN

1/4"=1'-0"

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SHEET NAME
ELEVATION- CRAFTSMAN

PROJECT NAME
MASTER PLAN D2357.1

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|---|---|---|
| | | |

SUBMITTALS / REVISIONS

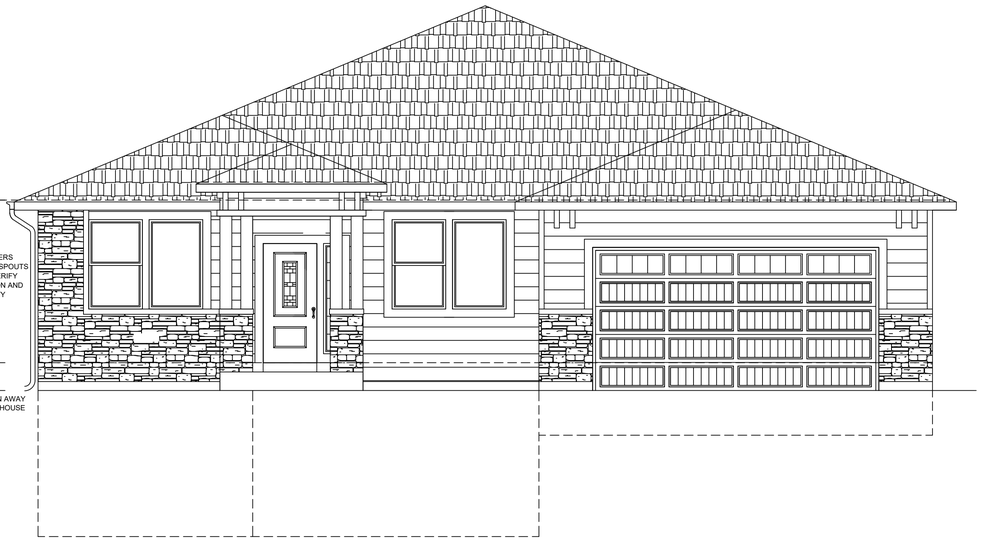
| BY | TYPE | DATE |
|---|---|---|
| | | |

ELEVATION CRAFT.

SHEET NUMBER
39

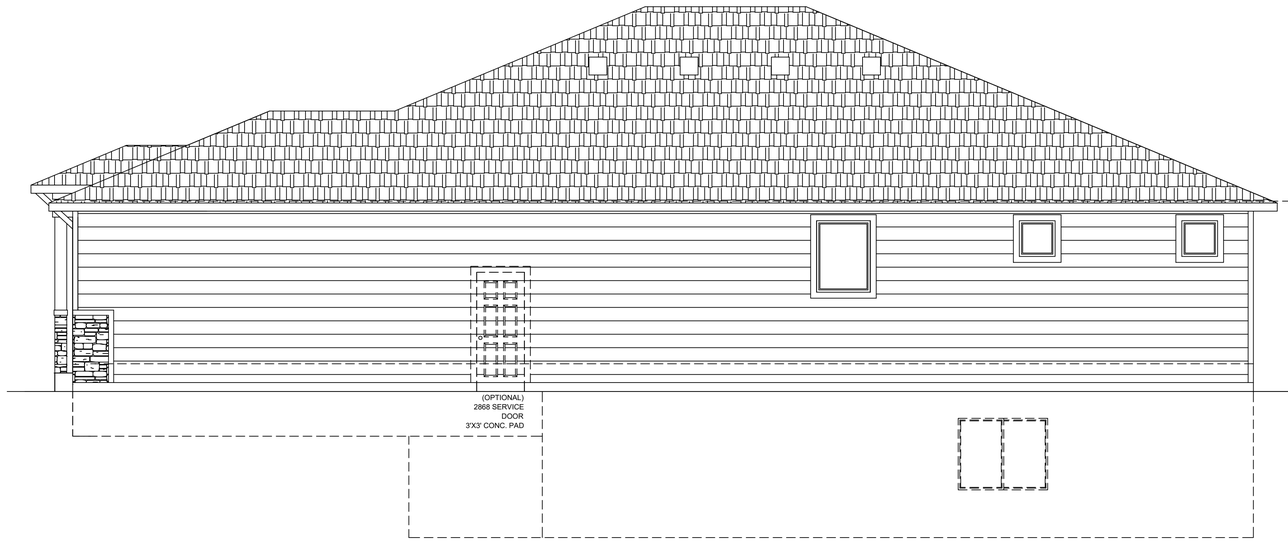
D2357.1 SIDE ELEVATION- MODERN PRAIRIE

1/4"=1'-0"



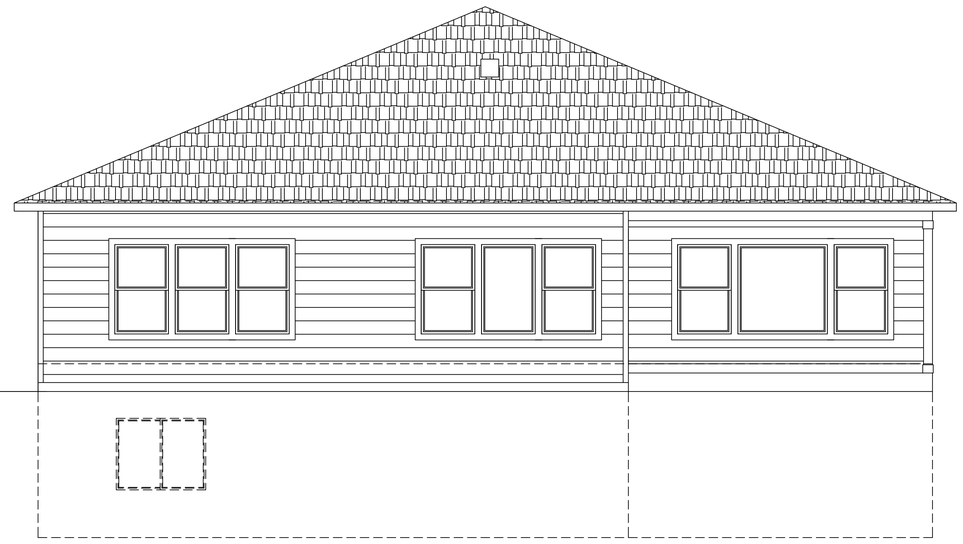
D2357.1 FRONT ELEVATION-MODERN PRAIRIE

1/4"=1'-0"




GARAGE SIDE ELEVATION- MODERN PRAIRIE

1/4"=1'-0"



REAR ELEVATION- MODERN PRAIRIE

1/4"=1'-0"

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719-598-5192

SHEET NAME
ELEVATION- MODERN PRAIRIE

PROJECT NAME
MASTER PLAN D2357.1

STAMPS/ENDORSEMENTS

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|---|---|---|
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SUBMITTALS / REVISIONS

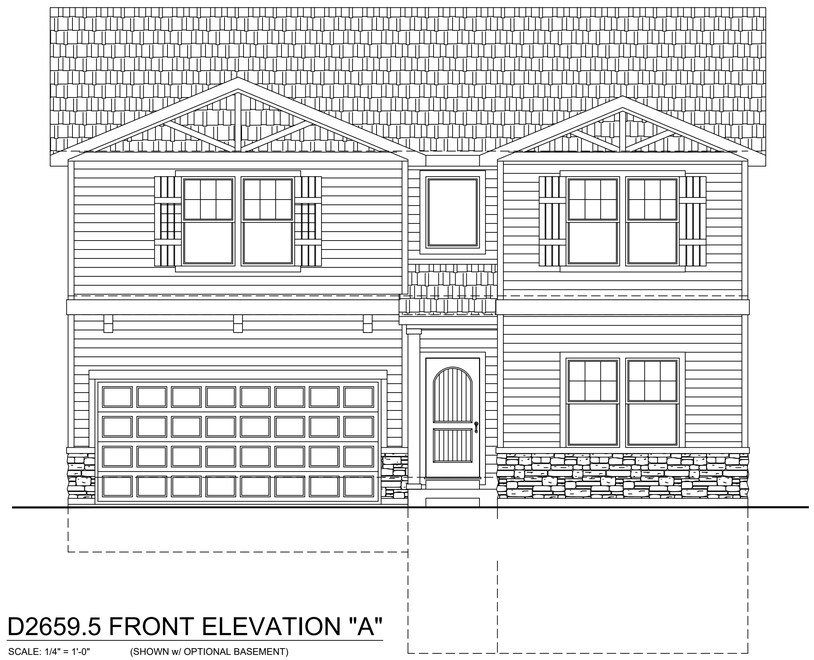
| BY | TYPE | DATE |
|---|---|---|
| | | |

ELEVATION MOD. PR.

SHEET NUMBER
40

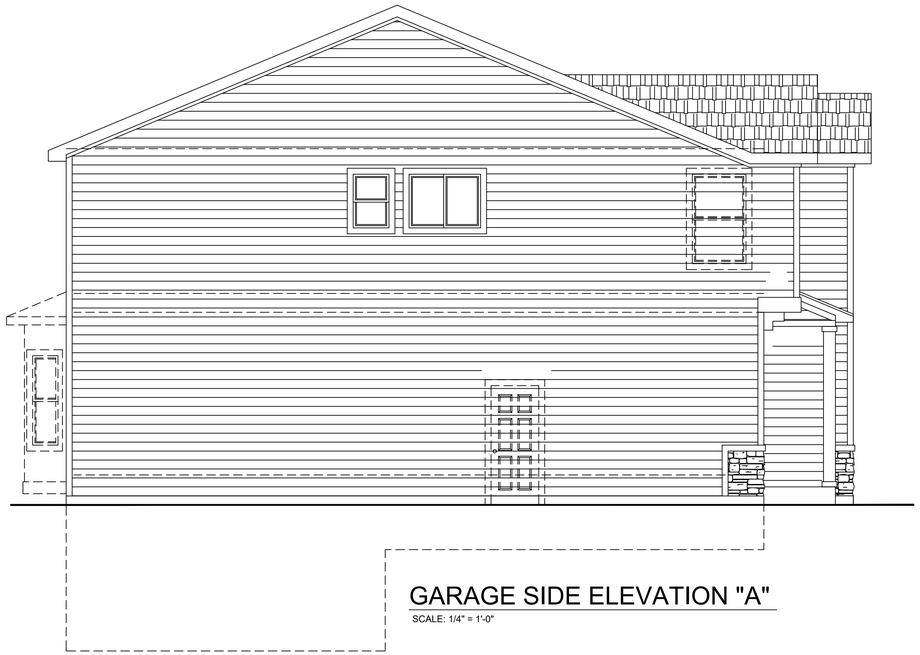
REAR ELEVATION "A"

SCALE: 1/4" = 1'-0"



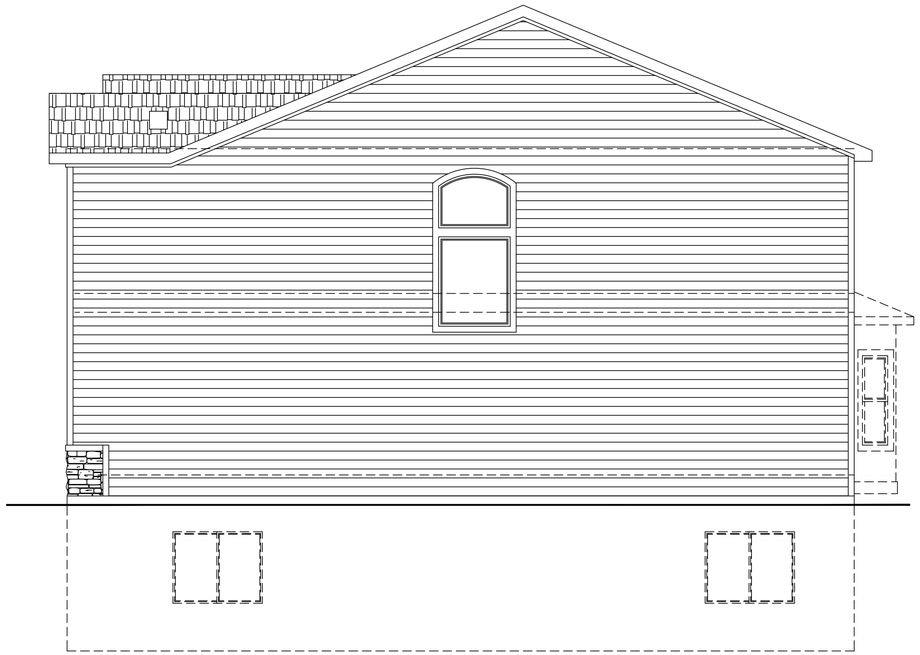
D2659.5 FRONT ELEVATION "A"

SCALE: 1/4" = 1'-0" (SHOWN w/ OPTIONAL BASEMENT)



GARAGE SIDE ELEVATION "A"

SCALE: 1/4" = 1'-0"



RIGHT ELEVATION "A"

SCALE: 1/4" = 1'-0"

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SHEET NAME
ELEVATION- "A"

PROJECT NAME
MASTER PLAN D2659.5

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DRAWN BY:
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DATE:
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ELEVATION "A"

SHEET NUMBER
41

REAR ELEVATION "B"

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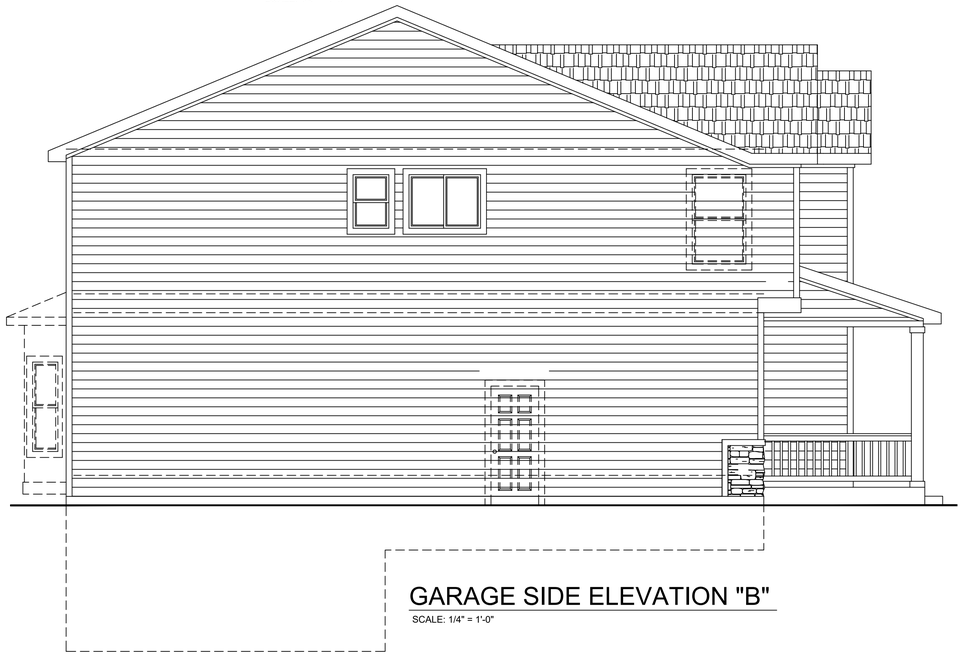
D2659.5 FRONT ELEVATION "B"

SCALE: 1/4" = 1'-0" (SHOWN w/ OPTIONAL BASEMENT)



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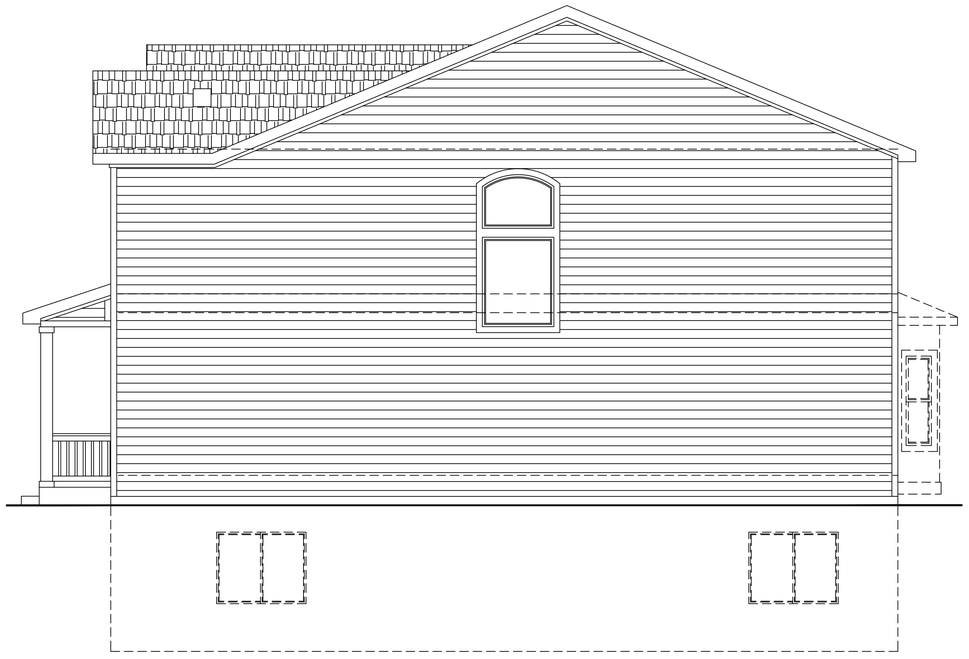

RIGHT ELEVATION "B"

SCALE: 1/4" = 1'-0"

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SHEET NAME: ELEVATION- "B"

PROJECT NAME: MASTER PLAN D2659.5

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ELEVATION "B"

SHEET NUMBER 42

REAR ELEVATION "E"

SCALE: 1/4" = 1'-0"

D2659.5 FRONT ELEVATION "E"

SCALE: 1/4" = 1'-0" (SHOWN w/ OPTIONAL BASEMENT)

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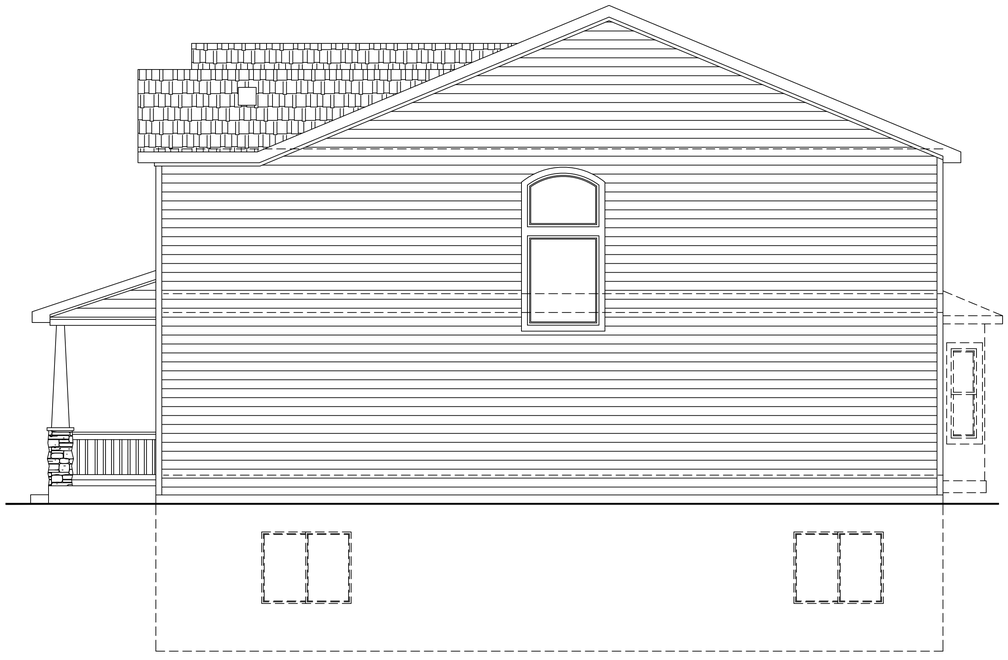
SCALE: 1/4" = 1'-0"



RIGHT ELEVATION "E"

SCALE: 1/4" = 1'-0"

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PROJECT NAME: MASTER PLAN D2659.5

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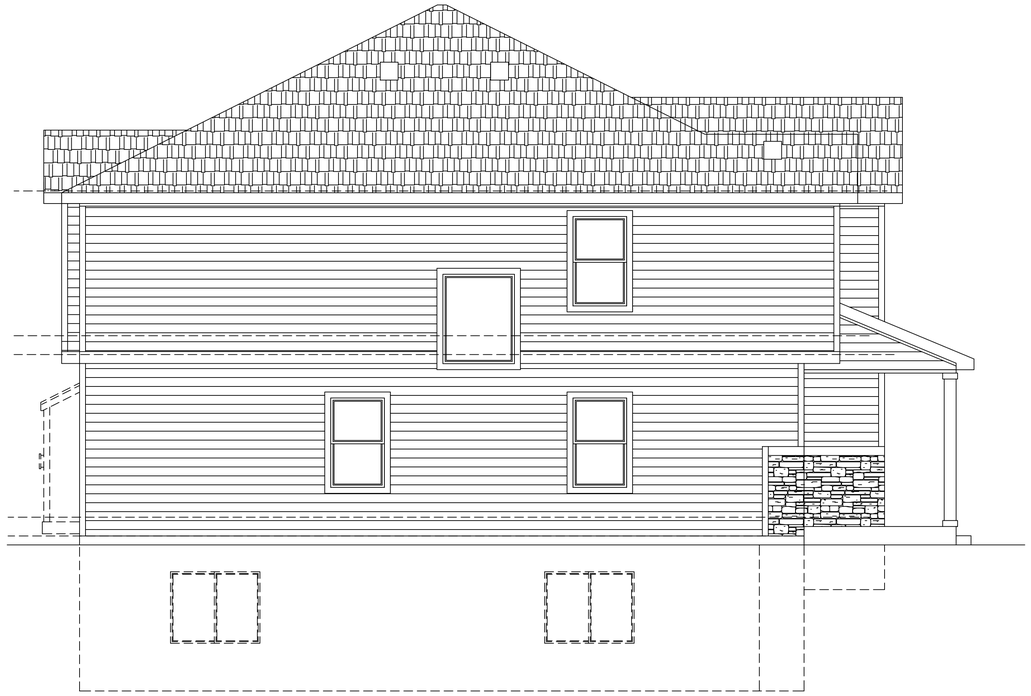
ELEVATION "E"

SHEET NUMBER
43



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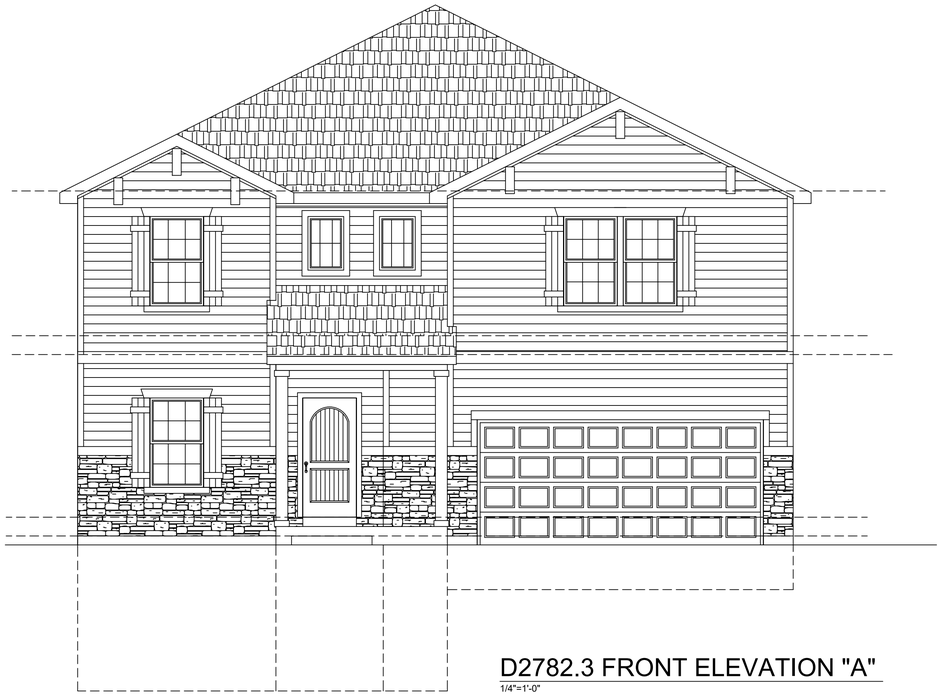

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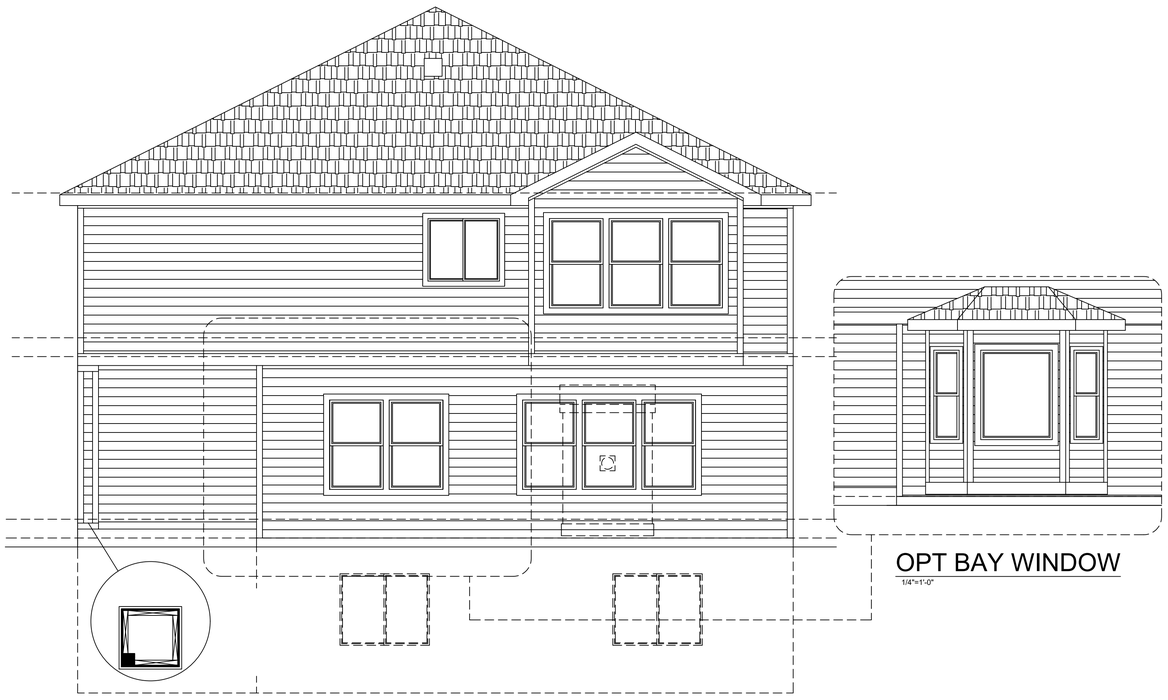
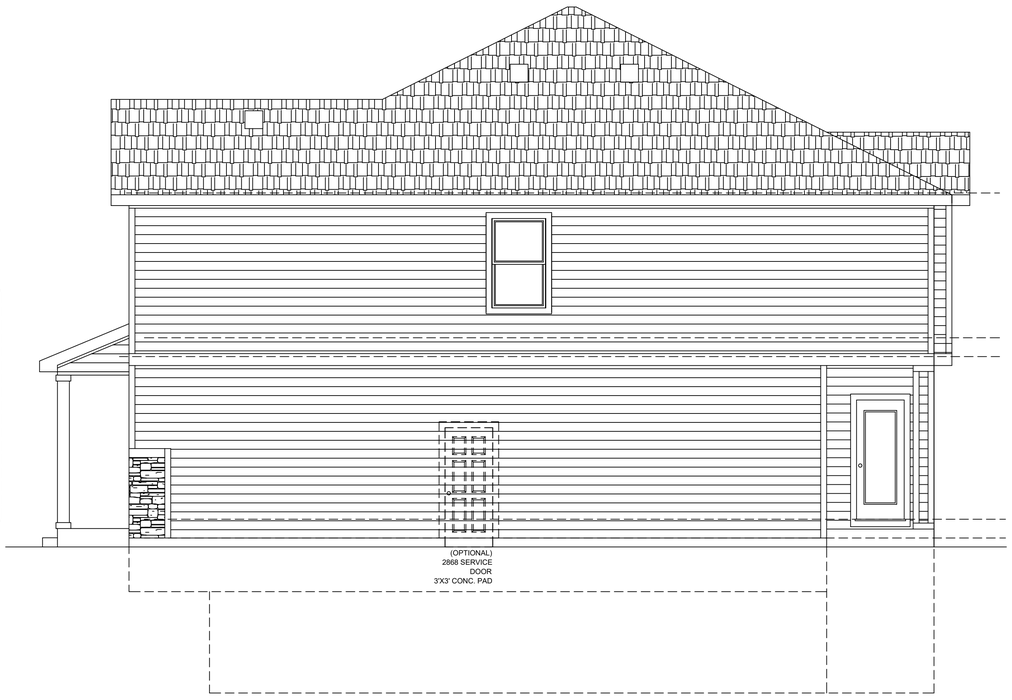


REAR ELEVATION "A"
1/4"=1'-0"



OPT BAY WINDOW
1/4"=1'-0"




GARAGE SIDE ELEVATION "A"
1/4"=1'-0"

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PROJECT NAME
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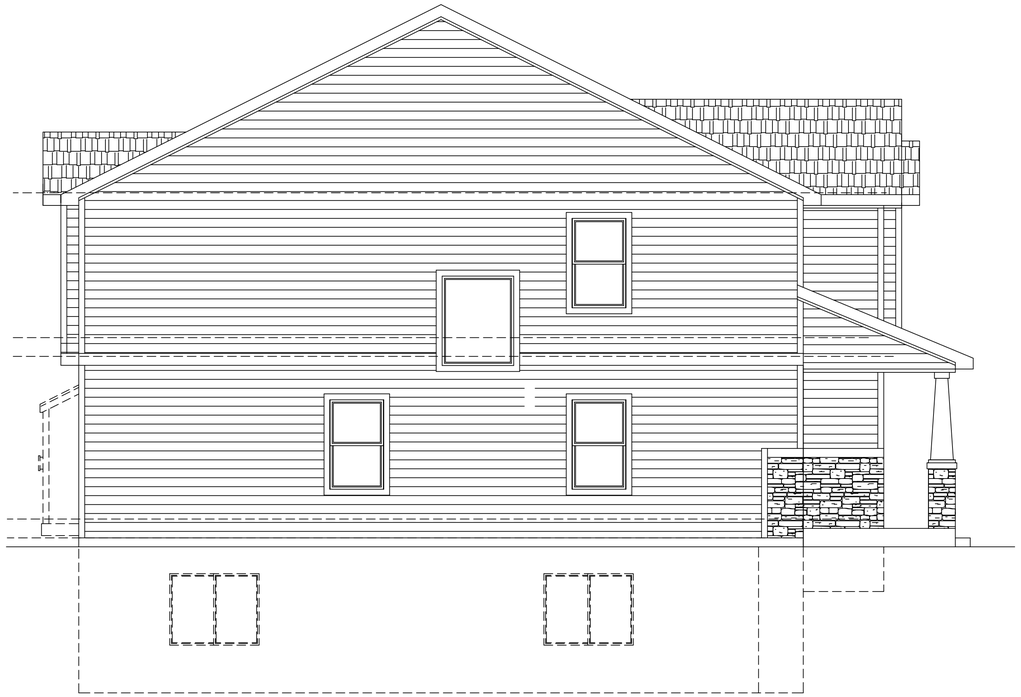
ELEVATION "A"

SHEET NUMBER
44



SIDE ELEVATION "B"
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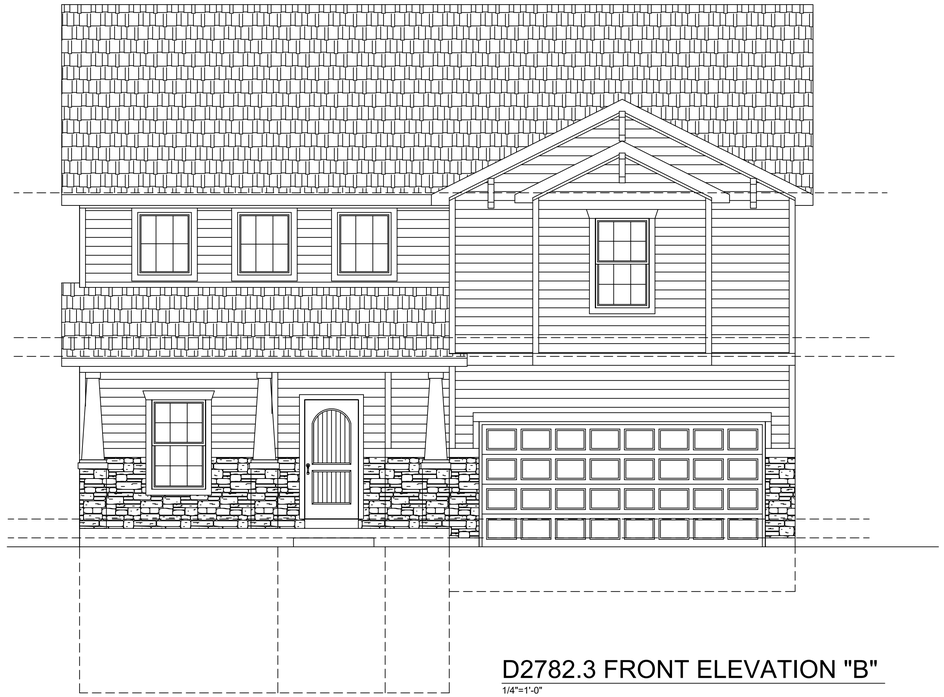

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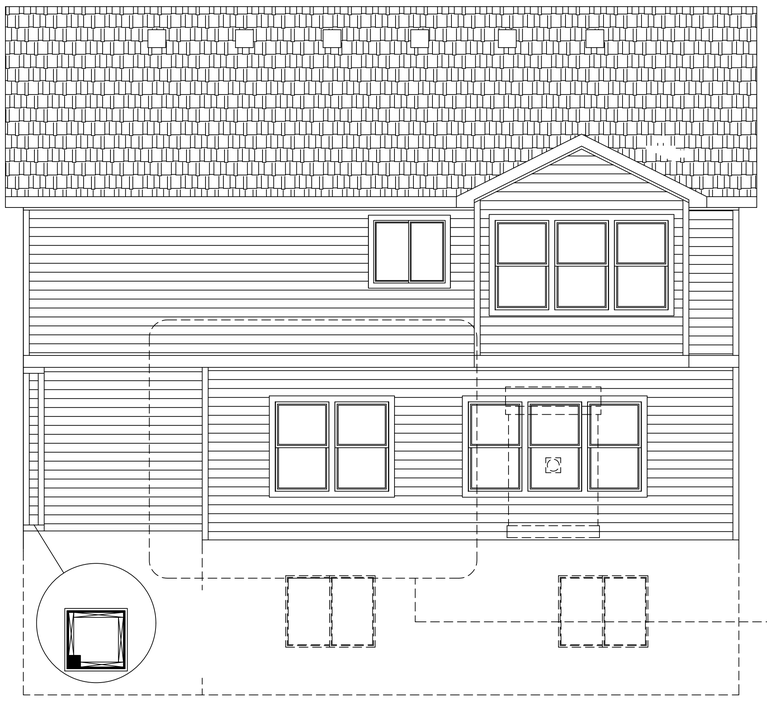

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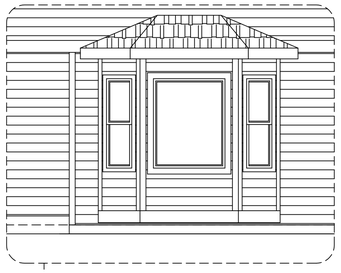
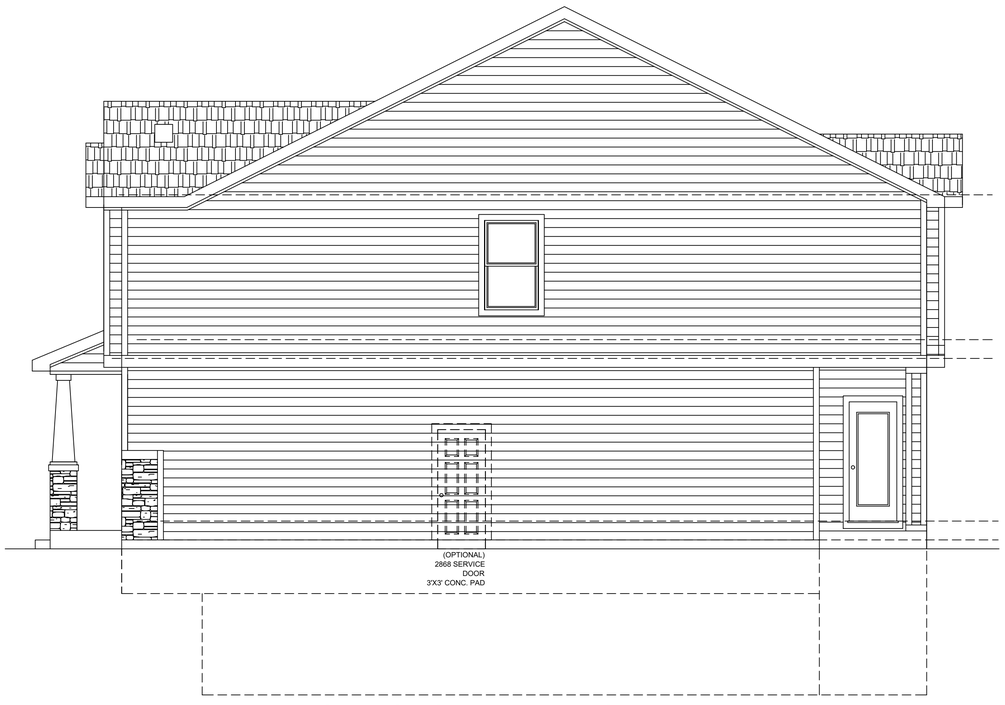


OPT BAY WINDOW
1/4"=1'-0"




GARAGE SIDE ELEVATION "B"
1/4"=1'-0"

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ELEVATION "B"

SHEET NUMBER
45

SIDE ELEVATION "C"
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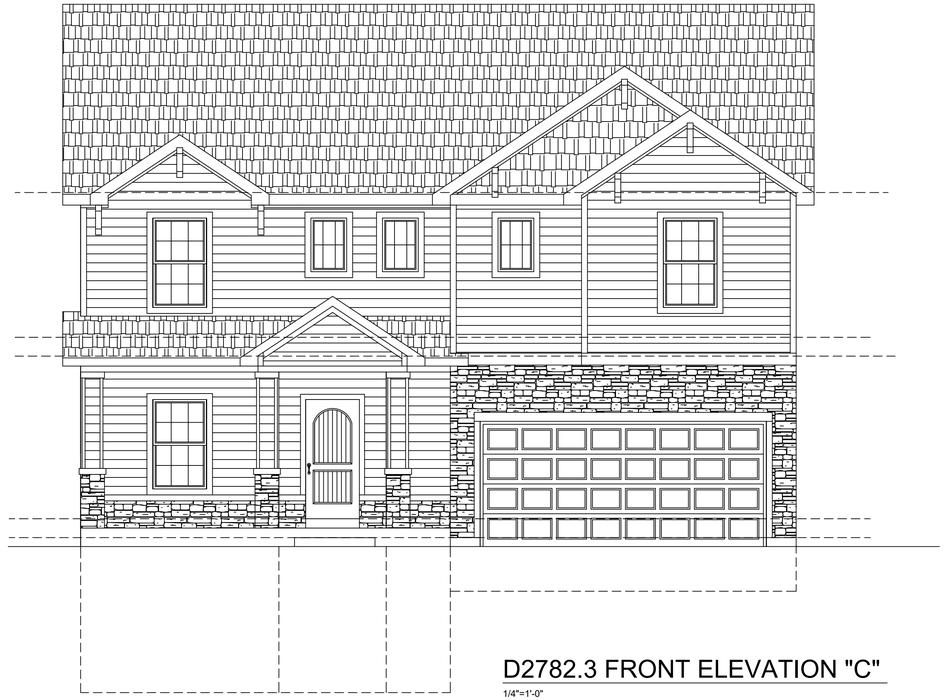

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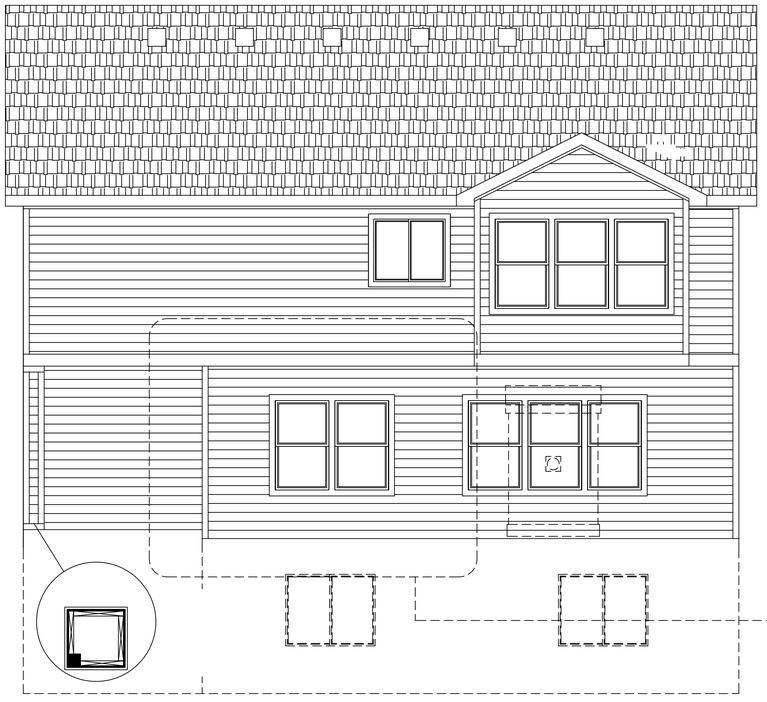
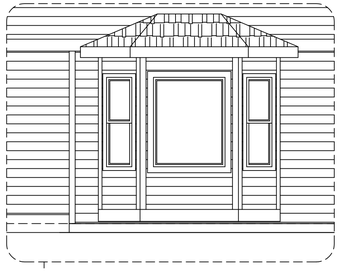
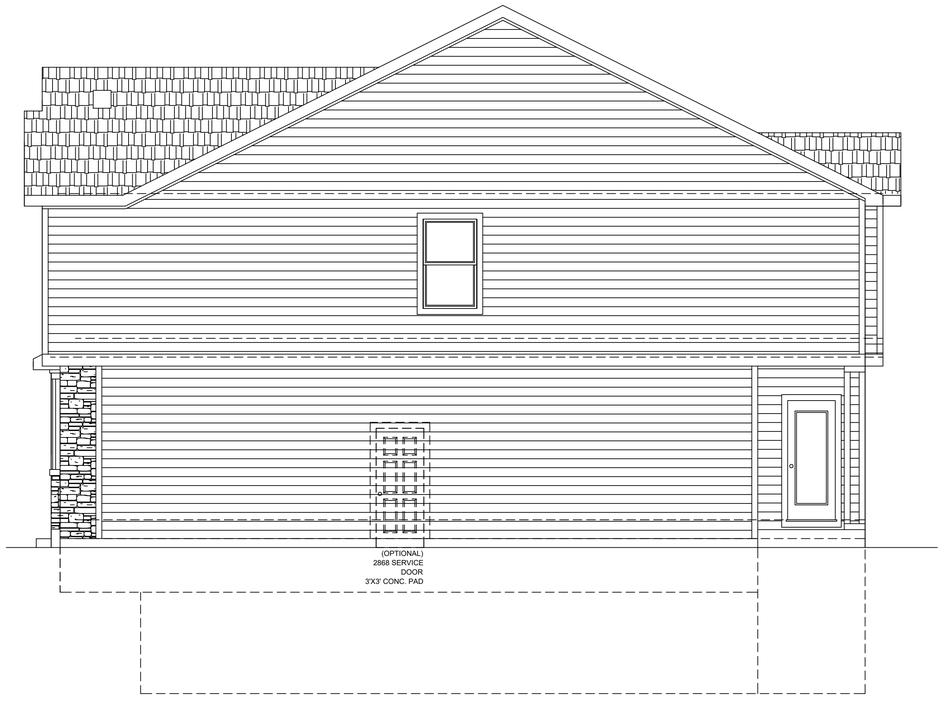




OPT BAY WINDOW
1/4"=1'-0"

REAR ELEVATION "C"
1/4"=1'-0"




GARAGE SIDE ELEVATION "C"
1/4"=1'-0"

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ELEVATION- "C"

PROJECT NAME
MASTER PLAN D2782.3

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ELEVATION "C"

SHEET NUMBER
46

# COYOTE CREEK FILING NO. 4
# PRELIMINARY PHASE II DRAINAGE REPORT

November 2021

Prepared For:
**Lupton Land, LLC**
10221 Prestwick Trail
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Contact: Bob Quinette

Prepared By:
**JR ENGINEERING, LLC**
7200 South Alton Way, Suite C400
Centennial, Colorado 80112
303-740-9393
Contact: Aaron Clutter, PE

(Project No. 16093.00)

# Table of Contents

CERTIFICATION STATEMENT ..... ii
I. LOCATION & BASIN DESCRIPTION ..... 1
Project Location and Description ..... 1
II. DRAINAGE BASINS ..... 2
Major Basin Description ..... 2
Proposed Sub-Basin Description ..... 2
III. DRAINAGE DESIGN CRITERIA ..... 4
Development Criteria Reference ..... 4
Hydrologic Criteria ..... 4
Hydraulic Criteria ..... 4
IV. DRAINAGE FACILITY DESIGN ..... 4
General Concept ..... 4
Conformance with Coyote Creek Master Drainage Study ..... 5
V. SUMMARY ..... 5
VI. REFERENCES ..... 5

**Appendices**

A: Vicinity Map, Hydrologic Soils Group, IDF Data, FIRMette
B: Hydrologic Calculation
C: Coyote Creek Master Drainage Report Reference
D: Drainage Maps

# CERTIFICATION STATEMENT

This Preliminary Drainage Report for the design of the Coyote Creek Filing No. 4 development was prepared by me or under my direct supervision in accordance with the City of Fort Lupton's Standards and Specifications and acceptable professional practices of the industry. We acknowledge that the City of Fort Lupton's review of this Preliminary Drainage Report is only for general conformance with submittal requirements, current design criteria and standard engineering principles and practices. We are also aware of the provisions of the City Code of the City of Fort Lupton.

_____

Andrew J Hugill, Registered Professional Engineer
Colorado Professional Engineer No. 57007
For and on behalf of JR Engineering, LLC

# I. LOCATION & BASIN DESCRIPTION

## Project Location and Description

Coyote Creek Filing No. 4 is a proposed single-family residential Planned Unit Development (PUD) located within Section 5, Township 1 North, Range 66 West of the 6th Principal Meridian, City of Fort Lupton, Weld County, Colorado.

The approximately 13-acre site is bounded by the Shortline Ditch regional channel to the west, Twombly Elementary School to the north, and Coyote Creek Golf Course to the southeast and 4th St. to the south. The site is located roughly 1,000 feet north of 1st St. and 600 feet south of 9th St. A vicinity map is included in Appendix A. The site is located within the Coyote Creek Subdivision with the Vincents East Subdivision directly to the west.

The site is composed of type B soils which are characterized as having a moderate infiltration rate when thoroughly wet. Approximately 90 percent of the site is covered in native grasses with the ground generally sloping from east to west between zero and 3 percent.

This report presents the preliminary drainage analysis for Coyote Creek Filing No. 4. The proposed use for this site will be a residential subdivision composed of 59 single-family detached units with a local park. There is a 30" irrigation line bisecting the approximate center of the site from east to west. There is an existing 30' sanitary sewer easement along the site's western boundary and a sanitary lift station located in the northwest corner of the site.

# II. DRAINAGE BASINS

## Major Basin Description

The existing Coyote Creek Filing No.4 site is vacant with no FIRM map panel available for the subject site but the FIRMette is located in Appendix A. The site is located within Zone X which is a zone of minimal flood hazard.

## Proposed Sub-Basin Description

Existing runoff generated from the site is routed from east to west via sheet flow into the Shortline Ditch. There is also a small portion of the existing site that is depressed with a concrete overflow structure and 18" CMP pipe to drain the area west into the adjacent Shortline ditch. The Shortline ditch routes all runoff from the site north to a regional detention facility.

Sub-basin A1:
Sub-basin A1 is approximately 2.33 acres in size and made up of single family residential area, lawns/open space, streets and sidewalk. Runoff (Q5 = 3.9 cfs, and Q100 = 9.8 cfs) generated in this basin is currently conveyed via sheet flow to Lupton Lane where the flow will ultimately be conveyed southwest via curb and gutter to a 10' Type R sump Inlet at design point 1 (DP1). Flows collected at this inlet will be piped northwest to the Shortline ditch.

Sub-basin A2:
Sub-basin A2 is approximately 2.02 acres in size and made up of single family residential area, lawns/open space, streets and sidewalk. Runoff (Q5 = 4.1 cfs, and Q100 = 9.7 cfs) generated in this basin is currently conveyed via sheet flow to Raffi Road and Lupton Lane where the flow will ultimately be conveyed south west via curb and gutter to a 10' Type R sump Inlet at design point 2 (DP2). Flows collected at this inlet will be piped northwest to the Shortline ditch.

Sub-basin A3:
Sub-basin A3 is approximately 1.21 acres in size and made up of single family residential area, lawns/open space, streets and sidewalk. Runoff (Q5 = 2.2 cfs, and Q100 = 5.4 cfs) generated in this basin is currently conveyed via sheet flow to Raffi Road where the flow will ultimately be conveyed north via curb and gutter to a 10' Type R Inlet at design point 3 (DP3). Flows collected at this inlet will be piped west to the Shortline ditch.

Sub-basin A4:
Sub-basin A4 is approximately 2.94 acres in size and made up of single family residential area, lawns/open space, streets and sidewalk. Runoff (Q5 = 5.7 cfs, and Q100 = 13.8 cfs) generated in this basin is currently conveyed via sheet flow to Lupton Lane and Logan Way where the flow will ultimately be conveyed west via curb and gutter to a 10' Type R Inlet at design point 4 (DP4). Flows collected at this inlet will be piped north then west to the Shortline ditch.

Sub-basin A5:
Sub-basin A5 is approximately 3.88 acres in size and made up of single family residential area, lawns/open space, streets and sidewalk. Runoff (Q5 = 6.4 cfs, and Q100 = 16.1 cfs) generated in

this basin is currently conveyed via sheet flow to Raffi Road and Logan Way where the flow will ultimately be conveyed north via curb and gutter to a 10' Type R Inlet at design point 5 (DP5). Flows collected at this inlet will be piped west to the Shortline ditch.

Sub-basin B1:
Sub-basin B1 is approximately 0.73 acres in size and made up of lawns/open space. Runoff (Q5 = 0.4 cfs, and Q100 = 2.1 cfs) generated in this basin is currently conveyed via sheet flow west directly into the Shortline Ditch.

Sub-basin B2:
Sub-basin B2 is approximately 0.17 acres in size and made up of single family residential area, lawns/open space, streets and sidewalk. Runoff (Q5 = 0.5 cfs, and Q100 = 1.2 cfs) generated in this basin is currently conveyed via sheet flow to Raffi Road where the flow will ultimately be conveyed north via curb and gutter to a crosspan at design point 7 (D). Flows collected at this crosspan will travel approximately 120' along existing curb and gutter before entering an existing concrete rundown into the Shortline Ditch.

# III. DRAINAGE DESIGN CRITERIA

## Development Criteria Reference

Storm Drainage Analysis and Design Criteria for this project were implemented from the City of Fort Lupton Storm Drainage Criteria and the "Urban Storm Drainage Criteria Manual" by Mile High Flood District (MHFD).

The design storms are the 5-year storm event and the 100-year storm event. Storm sewer and roadways have been designed to safely convey the 5-year and 100-year event assuming all inlets are clogged. Rainfall intensity data was taken from Table 502 of City of Fort Lupton Criteria which can be found in Appendix A.

## Hydrologic Criteria

All hydrologic data was obtained from the "City of Fort Lupton Standards and Specifications Manual" and the "Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual" Volumes 1, 2, and 3. Onsite drainage improvements were designed based on the 5 year (minor) storm event and the 100-year (major) storm event. Runoff was calculated using the Rational Method, and rainfall intensities for the 5-year and the 100-year storm return frequencies were obtained from Table 502 of the Fort Lupton Criteria Located in Appendix A. Runoff coefficients were determined based on proposed land use and from data in Table 602 from Section 6 of the Fort Lupton Criteria. Time of concentrations were developed using equations from Section 6 of the Fort Lupton Criteria. All runoff calculations and applicable charts and graphs are included in Appendix B.

## Hydraulic Criteria

The Rational Method and USDCM's SF-2 and SF-3 forms were used to determine the runoff from the minor and major storms on the site. UDFCD UD-Inlet v5.05. will be used to size the inlets.

# IV. DRAINAGE FACILITY DESIGN

## General Concept

The proposed Coyote Creek Filing No. 4 site is designed to convey generated runoff via storm sewers, along curb and gutter, and via surface flow to the existing Shortline Ditch on the west side of the site. Secondly, surface overflow paths have been provided, such that the 100-year storm flows remain at least one foot below the finished floor elevation in a fully clogged inlet condition. This report analyses runoff generated on-site and not any runoff generated on the golf course to the east. The Master Drainage study for Coyote creek indicates that the Golf Course is responsible to capture all flow generated from the course.

## Conformance with Coyote Creek Master Drainage Study

Coyote Creek Filing No. 4 was originally studied in the Coyote Creek Master Drainage Study by Merrick and Company dated September 12, 1996. Filing No.4 is known within the Master Study as Basin I. The Master Drainage Study can be found in Appendix C. The original intent for the basin was for Multifamily residential use with a specific road layout and the master study indicates that if the site use, grading, and street alignment change that a Phase II or Phase III report will need to be done. The purpose of this report is to account for the changes from the Master Study.

The Master Study indicates that no detention or water quality is necessary for the site once the City completes the Regional Detention Facility to the north which exists at this time. The Master study also indicates "The golf course will be required to retain all of their runoff on the golf course for all events up to a maximum of the 100-year storm". This report does not account for any runoff generated on the golf course to the east and only analyses the basins on the property which is consistent with the Master Drainage Study.

# V. SUMMARY

The proposed site improvements for the Coyote Creek Filing No. 4 site are consistent with the approved Master Drainage Study referenced herein. On-site detention is not required as all site runoff will be directed to the Shortline Ditch and ultimately the Regional Detention Pond. Once flow data for the Shortline Ditch becomes available, the addition of site flows will be analyzed. It is assumed that there is sufficient capacity in the Shortline Ditch to handle site runoff during the 100 year event. The site has no adverse drainage impacts on adjacent properties, surrounding developments, or downstream infrastructure. As a result, the proposed drainage design outlined in this report meets the latest City of Fort Lupton Storm Drainage Criteria.

# VI. REFERENCES

1. 2018 International Fire Code; 2018
2. City of Fort Lupton, Standards and Specifications for the Design and Construction of Public Improvements; 2014
3. City of Fort Lupton and Clear Water Solutions, Inc., 2018 Municipal Water Efficiency Plan; 2018.
4. Merrick & Company, Coyote Creek Master Drainage Study

# Appendix A
# Vicinity Map, Hydrologic Soils Group, IDF Data, FIRMette

N

500 250 0 500

ORIGINAL SCALE: 1" = 500'

APPENDIX A
VICINITY MAP
JOB NO. 16093.00
2021-11-10
SHEET 1 OF 1

J·R ENGINEERING
A Westrian Company

Centennial 303-740-9393 • Colorado Springs 719-593-2593
Fort Collins 970-491-9888 • www.jrengineering.com

Map Scale: 1:2,510 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 35 70 140 210

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

## MAP LEGEND

**Area of Interest (AOI)**

- Area of Interest (AOI)

**Soils**

**Soil Rating Polygons**

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

**Soil Rating Lines**

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

**Soil Rating Points**

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

**Water Features**

- Streams and Canals

**Transportation**

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

**Background**

- Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Weld County, Colorado, Southern Part
Survey Area Data: Version 20, Aug 31, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 19, 2018—Aug 10, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

# Hydrologic Soil Group

| Map unit symbol | Map unit name | Rating | Acres in AOI | Percent of AOI |
|---|---|---|---|---|
| 37 | Nelson fine sandy loam, 0 to 3 percent slopes | B | 6.7 | 41.0% |
| 47 | Olney fine sandy loam, 1 to 3 percent slopes | B | 9.6 | 59.0% |
| **Totals for Area of Interest** | | | **16.2** | **100.0%** |

## Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

## Rating Options

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff: None Specified*

*Tie-break Rule:* Higher

Table 502
Time-Intensity-Frequency Tabulation
for the Rational Method

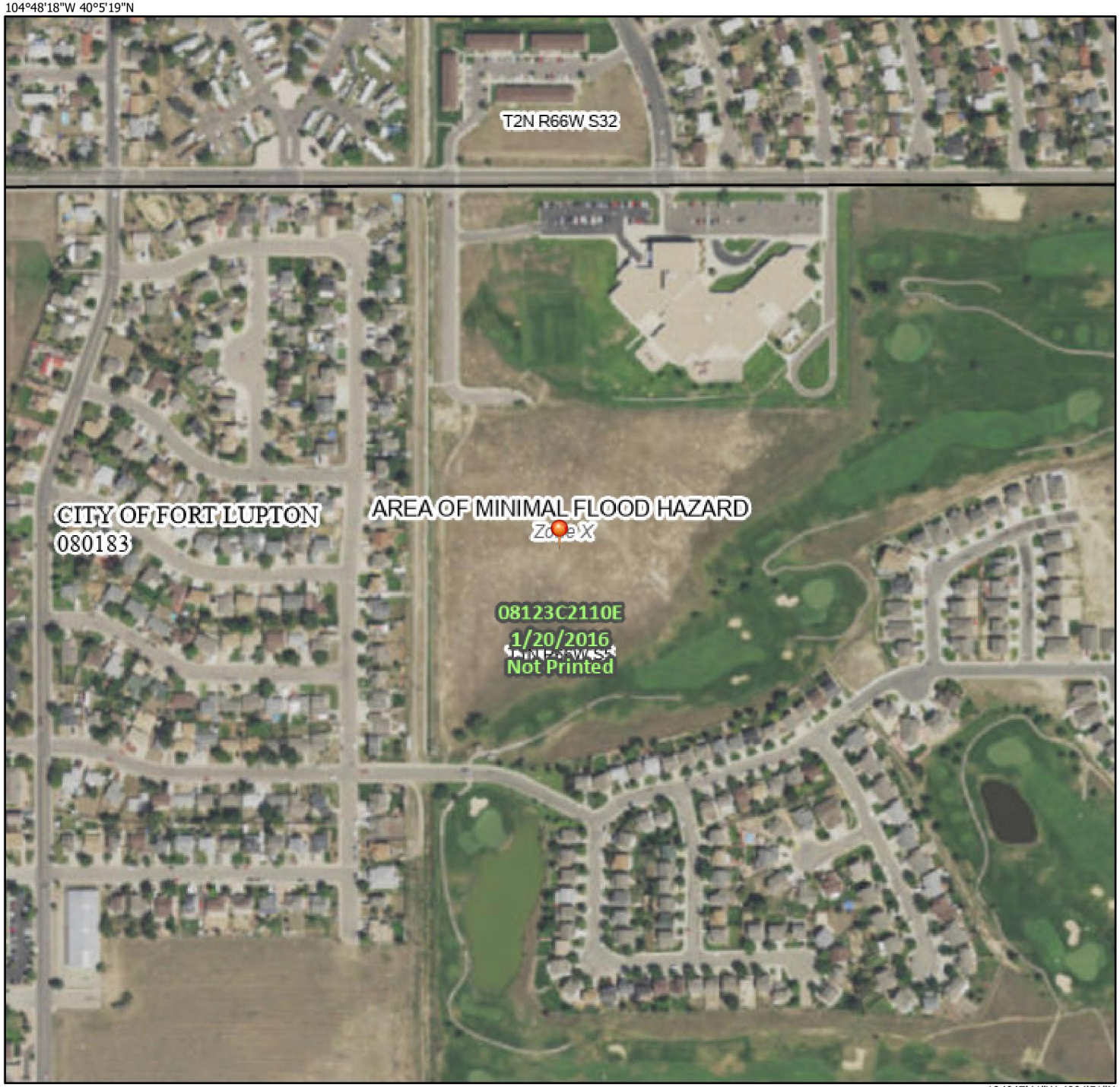
Rainfall Intensity
(in/hr)/duration

| Frequency | 5-min | 10-min | 15-min | 30-min | 60-min |
|---|---|---|---|---|---|
| 2-year | 3.48 | 2.70 | 2.28 | 1.58 | 1.00 |
| 5-year | 4.92 | 3.84 | 3.24 | 2.24 | 1.42 |
| 10-year | 5.88 | 4.56 | 3.84 | 2.66 | 1.68 |
| 50-year | 8.16 | 6.36 | 5.36 | 3.72 | 2.35 |
| 100-year | 9.48 | 7.32 | 6.16 | 4.28 | 2.71 |

# National Flood Hazard Layer FIRMette

FEMA

104°48'18"W 40°5'19"N




104°47'41"W 40°4'51"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

*Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020*

## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

**SPECIAL FLOOD HAZARD AREAS**
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

**OTHER AREAS OF FLOOD HAZARD**
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

**OTHER AREAS**
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

**GENERAL STRUCTURES**
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

**OTHER FEATURES**
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

**MAP PANELS**
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 11/16/2021 at 11:30 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

# Appendix B
# Hydrologic Calculations

# COMPOSITE RUNOFF COEFFICIENT CALCULATIONS

Subdivision: Coyote Creek Filing No. 4
Location: Fort Lupton

Project Name: Liberty Animal Hospital
Project No.: 16093.00
Calculated By: AJH
Checked By:
Date: 11/10/21

| Basin ID | Total Area (ac) | Paved Roads/Walks | | | Single Family | | | Lawns/Open Space | | | Basins Total Weighted 5 YEAR C | Basins Total Weighted 100 YEAR C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Area (ac) | 5 - YEAR C | 100 - YEAR C | Area (ac) | 5 - YEAR C | 100 - YEAR C | Area (ac) | 5 - YEAR C | 100 - YEAR C | | |
| | | | | | | | | | | | | |
| A1 | 2.33 | 0.44 | 0.88 | 0.93 | 1.52 | 0.45 | 0.60 | 0.37 | 0.18 | 0.45 | 0.49 | 0.64 |
| A2 | 2.02 | 0.61 | 0.88 | 0.93 | 1.27 | 0.45 | 0.60 | 0.15 | 0.18 | 0.45 | 0.56 | 0.69 |
| A3 | 1.21 | 0.23 | 0.88 | 0.93 | 0.90 | 0.45 | 0.60 | 0.09 | 0.18 | 0.45 | 0.51 | 0.65 |
| A4 | 2.94 | 0.68 | 0.88 | 0.93 | 1.97 | 0.45 | 0.60 | 0.30 | 0.18 | 0.45 | 0.52 | 0.66 |
| A5 | 3.88 | 0.84 | 0.88 | 0.93 | 2.28 | 0.45 | 0.60 | 0.77 | 0.18 | 0.45 | 0.49 | 0.64 |
| B1 | 0.73 | 0.00 | 0.88 | 0.93 | 0.00 | 0.45 | 0.60 | 0.73 | 0.18 | 0.45 | 0.18 | 0.45 |
| B2 | 0.17 | 0.07 | 0.88 | 0.93 | 0.09 | 0.45 | 0.60 | 0.00 | 0.18 | 0.45 | 0.63 | 0.74 |
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# STANDARD FORM SF-2
# TIME OF CONCENTRATION

Subdivision: Coyote Creek Filing No. 4
Location: Fort Lupton

Project Name: Liberty Animal Hospital
Project No.: 16093.00
Calculated By: AJH
Checked By:
Date: 11/10/21

| SUB-BASIN DATA | | | | | | INITIAL/OVERLAND ($T_i$) | | | TRAVEL TIME ($T_t$) | | | | | *tc* CHECK (URBANIZED BASINS) | | | FINAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BASIN ID | D.A. (ac) | Hydrologic Soils Group | Impervious (%) | $C_5$ | $C_{100}$ | $L$ (ft) | $S_o$ (%) | $t_i$ (min) | $L_t$ (ft) | $S_t$ (%) | $K$ | VEL. (ft/s) | $t_t$ (min) | COMP. $t_c$ (min) | TOTAL LENGTH (ft) | Urbanized $t_c$ (min) | $t_c$ (min) |
| | | | | | | | | | | | | | | | | | |
| A1 | 2.33 | B | 52% | 0.49 | 0.64 | 140 | 2.8 | 9.3 | 588 | 1.7 | 20.0 | 2.6 | 3.8 | 13.0 | 728.0 | 13.3 | 13.0 |
| A2 | 2.02 | B | 61% | 0.56 | 0.69 | 108 | 2 | 8.0 | 565 | 1.8 | 20.0 | 2.7 | 3.5 | 11.6 | 673.0 | 13.1 | 11.6 |
| A3 | 1.21 | B | 56% | 0.51 | 0.65 | 140 | 1.64 | 10.7 | 360 | 0.8 | 20.0 | 1.8 | 3.4 | 14.0 | 500.0 | 12.0 | 12.0 |
| A4 | 2.94 | B | 56% | 0.52 | 0.66 | 100 | 3.8 | 6.7 | 760 | 2.1 | 20.0 | 2.9 | 4.4 | 11.1 | 860.0 | 14.2 | 11.1 |
| A5 | 3.88 | B | 51% | 0.49 | 0.64 | 197 | 2.74 | 11.1 | 664 | 2.1 | 20.0 | 2.9 | 3.8 | 14.9 | 861.0 | 13.7 | 13.7 |
| B1 | 0.73 | B | 7% | 0.18 | 0.45 | 77 | 1 | 14.5 | 684 | 0.3 | 20.0 | 1.1 | 10.4 | 24.9 | 761.0 | 13.8 | 13.8 |
| B2 | 0.17 | B | 69% | 0.63 | 0.74 | 67 | 3.87 | 4.4 | 85 | 2 | 20.0 | 2.8 | 0.5 | 4.9 | 152.0 | 10.5 | 5.0 |
| | | | | | | | | | | | | | | | | | |
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*NOTES:*

$$t_C = t_i + t_t \quad (6\text{-}2)$$

Where: $t_c$ = time of concentration (minutes)
$t_i$ = initial time or overland flow time (minutes)
$t_t$ = travel time in the ditch, channel, gutter, storm sewer, etc. (minutes)

$$t_c = \frac{L}{180} + 10 \quad (6\text{-}5)$$

Where: $t_c$ = time of concentration at the first design point (minutes)
L = length of basin (feet)

$$t_i = \frac{1.8(1.1-C5)\sqrt[2]{L}}{\sqrt[3]{s}} \quad (6\text{-}3)$$

Where: $t_i$ = overland flow time (minutes)
$C_5$ = runoff coefficient for 5-year frequency (Table 602)
L = length of overland flow (feet, 500 feet maximum)
s = average basin slope (percent)

For basin lengths greater than 500 feet, the overland flow time needs to be considered in combination with the travel time ($t_t$). The travel time ($t_t$) is calculated using the hydraulic properties of the swale, ditch, channel, or street. Travel time is calculated using Equation 6-4. For preliminary work, the travel time ($t_t$) can be estimated using Figure 602.

$$t_t = \frac{L}{60V} \quad (6\text{-}4)$$

**Table 6-2. NRCS Conveyance factors, K**

| Type of Land Surface | Conveyance Factor, K |
|---|---|
| Heavy meadow | 2.5 |
| Tillage/field | 5 |
| Short pasture and lawns | 7 |
| Nearly bare ground | 10 |
| Grassed waterway | 15 |
| Paved areas and shallow paved swales | 20 |

Use a minimum $t_c$ value of 5 minutes for urbanized areas and a minimum $t_c$ value of 10 minutes for areas that are not considered urban. Use minimum values even when calculations result in a lesser time of concentration.

# STANDARD FORM SF-3

## STORM DRAINAGE SYSTEM DESIGN

(RATIONAL METHOD PROCEDURE)

Subdivision: Coyote Creek Filing No. 4
Location: Fort Lupton
Design Storm: 5-Year

Project Name: Liberty Animal Hospital
Project No.: 16093.00
Calculated By: AJH
Checked By:
Date: 11/10/21

| STREET | Design Point | DIRECT RUNOFF | | | | | | | TOTAL RUNOFF | | | | STREET | | | PIPE | | | | TRAVEL TIME | | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Basin ID | Area (Ac) | Runoff Coeff. | $t_c$ (min) | C*A (Ac) | I (in/hr) | Q (cfs) | tc (min) | C*A (ac) | I (in/hr) | Q (cfs) | $Q_{street}$ (cfs) | C*A (ac) | Slope (%) | $Q_{pipe}$ (cfs) | C*A (ac) | Slope (%) | Pipe Size (inches) | Length (ft) | Velocity (fps) | $t_t$ (min) | |
| | 1 | A1 | 2.33 | 0.49 | 13.0 | 1.14 | 3.46 | 3.9 | | | | | | | | | | | | | | | |
| | 2 | A2 | 2.02 | 0.56 | 11.6 | 1.13 | 3.65 | 4.1 | | | | | | | | | | | | | | | |
| | 2.2 | | | | | | | | 13.0 | 2.27 | 3.46 | 7.9 | | | | 7.9 | 2.3 | 0.5 | 24 | 91 | 5.1 | 0.3 | |
| | 3 | A3 | 1.21 | 0.51 | 12.0 | 0.62 | 3.59 | 2.2 | | | | | | | | | | | | | | | |
| | 4 | A4 | 2.94 | 0.52 | 11.1 | 1.53 | 3.72 | 5.7 | | | | | | | | | | | | | | | |
| | 5 | A5 | 3.88 | 0.49 | 13.7 | 1.90 | 3.38 | 6.4 | | | | | | | | | | | | | | | |
| | 3.3 | | | | | | | | 13.7 | 4.05 | 3.38 | 13.7 | | | | 13.7 | 4.1 | 0.5 | 24 | 91 | 5.7 | 0.3 | |
| | 6 | B1 | 0.73 | 0.18 | 13.8 | 0.13 | 3.37 | 0.4 | | | | | | | | | | | | | | | |
| | 7 | B2 | 0.17 | 0.63 | 5.0 | 0.11 | 4.92 | 0.5 | | | | | | | | | | | | | | | |
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Notes:
Street and Pipe C*A values are determined by Q/i using the catchment's intensity value.

# STANDARD FORM SF-3

## STORM DRAINAGE SYSTEM DESIGN

(RATIONAL METHOD PROCEDURE)

Subdivision: Coyote Creek Filing No. 4
Location: Fort Lupton
Design Storm: 100-Year

Project Name: Liberty Animal Hospital
Project No.: 16093.00
Calculated By: AJH
Checked By:
Date: 11/10/21

| STREET | Design Point | DIRECT RUNOFF | | | | | | | TOTAL RUNOFF | | | | STREET | | | PIPE | | | | TRAVEL TIME | | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Basin ID | Area (ac) | Runoff Coeff. | $t_c$ (min) | C*A (ac) | I (in/hr) | Q (cfs) | tc (min) | C*A (ac) | I (in/hr) | Q (cfs) | $Q_{street}$ (cfs) | C*A (ac) | Slope (%) | $Q_{pipe}$ (cfs) | C*A (ac) | Slope (%) | Pipe Size (inches) | Length (ft) | Velocity (fps) | $t_t$ (min) | |
| | 1 | A1 | 2.33 | 0.64 | 13.0 | 1.49 | 6.60 | 9.8 | | | | | | | | | | | | | | | |
| | 2 | A2 | 2.02 | 0.69 | 11.6 | 1.39 | 6.97 | 9.7 | | | | | | | | | | | | | | | |
| | 2.2 | | | | | | | | 13.0 | 2.88 | 6.60 | 19.0 | | | | 19.0 | 2.9 | 0.5 | 24 | 91 | 6.1 | 0.3 | |
| | 3 | A3 | 1.21 | 0.65 | 12.0 | 0.79 | 6.86 | 5.4 | | | | | | | | | | | | | | | |
| | 4 | A4 | 2.94 | 0.66 | 11.1 | 1.94 | 7.10 | 13.8 | | | | | | | | | | | | | | | |
| | 5 | A5 | 3.88 | 0.64 | 13.7 | 2.49 | 6.45 | 16.1 | | | | | | | | | | | | | | | |
| | 3.3 | | | | | | | | 13.7 | 5.22 | 6.45 | 33.7 | | | | 33.7 | 5.2 | 0.5 | 24 | 91 | 10.7 | 0.1 | |
| | 6 | B1 | 0.73 | 0.45 | 13.8 | 0.33 | 6.43 | 2.1 | | | | | | | | | | | | | | | |
| | 7 | B2 | 0.17 | 0.74 | 5.0 | 0.13 | 9.40 | 1.2 | | | | | | | | | | | | | | | |
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Notes:
Street and Pipe C*A values are determined by Q/i using the catchment's intensity value.

# Appendix C
# Coyote Creek Master Drainage Report Reference

# COYOTE CREEK
# MASTER DRAINAGE STUDY

SEPTEMBER 12, 1996

Prepared by:

**MERRICK & COMPANY**

MERRICK
Engineers & Architects

Coyote Creek PUD

# FT. LUPTON
# MASTER DRAINAGE STUDY

SEPTEMBER 12, 1996

JOB NO. 18012519
PHASE CODE 15051320
WBS CODE 1.1.4

PREPARED FOR:

NICHOLSON ENTERPRISES, INC.
MR. JIM NICHOLSON
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PREPARED BY:

MERRICK AND COMPANY
(2450 SOUTH PEORIA STREET)
P.O. BOX 22026
DENVER, CO 80222
(303)751-0741

**FT. LUPTON**
**MASTER DRAINAGE STUDY**
FT. LUPTON, CO
SEPTEMBER 12, 1996

## I. GENERAL LOCATION AND DESCRIPTION

The proposed Ft. Lupton Home Development consists of three single family subdivisions and one apartment subdivision containing a total of a 114 acres. The land was recently annexed into the City of Ft. Lupton from Weld County. It is located due east of the center of Ft. Lupton and is contained within the northwest one-quarter of Section 4 and the northeast one-quarter of Section 5, Township 1 North, Range 66 West of the 6th Principal Meridian. Primarily, it is bounded by State Highway 52 on the south, 9th Street on the north, an existing drainage ditch on the east, and College Ave. (a.k.a. 2950 Road) on the east. Aims Community College comprises a very small portion of the offsite drainage basin east of College Ave.. Other existing features are a water tank on the east side of the site, a farm house on the south, and Twombly Primary School at the northwest corner of the site. Separate from these parcels, but surrounding them is the Ft. Lupton Golf Course - now under construction.

The site is covered with native grasses and weeds. The major drainageway is the ditch flowing from south to north along the west property line. This ditch is trapezoidal in shape, with a top width of 20 feet, a bottom width of 5 feet and a depth of approximately 3 feet. An irrigation facility known as the Fulton Ditch winds its way through the center of the site from south to north. The development is shown on the Flood Insurance Rate Map as Zone C - defined by FEMA as an area of minimal flooding. The Federal Emergency Management Agency has not plotted any floodplains for this site.

## II. DRAINAGE BASINS AND SUB-BASINS

The City of Fort Lupton has no flood insurance rate maps according to the Federal Emergency Management Agency computer data base. The site is shown on the Weld County, Colorado Flood Insurance Rate Map Index. It is located on panel number 080266 0869 C which is not printed due to the area being in Zone C (area of minimal flooding). No other major drainageway planning studies of the area exist.

The drainage basin consists of sandy clay soils generally. The drainage flows from east to west at a 2% slope. Because the site is located along the easterly city limits, there are no planned land uses outside of the development other than the existing uses.

The Fulton Ditch is an irrigation facility which flows from south to north through the center of the site. The Fulton Ditch Manager, Mr. Lysle Dirrim, was contacted to determine site drainage requirements in relation to the ditch. He initially said the 10-year developed flow needs to be piped below the ditch. This requirement has recently changed to allowing no runoff from the sites to enter the ditch. A permit for crossing the ditch is required. A reinforced concrete pipe crossing will not require a casing. All other pipe materials need a concrete or iron casing to

minimize puncture and crushing problems and to allow the inner pipe to be extracted without interfering with the ditch. Concrete cutoff walls are required on both sides of the ditch to a depth of 3.5' to 4' below the pipe. It is preferable to cross with the pipe 3.5' below the ditch. The ditch engineer, Mr. Coby Haden with Rocky Mountain Consultants, will make any decisions if inverted siphon crossings are contemplated.

The overall site and golf course can be divided into two main drainage basins - a northerly and a southerly basin. The basins are divided by a ridge which is pronounced near the east side of the property and becomes less pronounced near the west portion of the property. Runoff from both basins flows from east to west.

One substantial offsite basin is tributary to the site. It is a long, thin basin approximately 2 miles long adjacent to the north side of State Highway 52. This basin contains 137.74 acres. Because this basin is virtually undeveloped, it very rarely generates any runoff. However, during the major storms, runoff from this basin will accumulate at the intersection of State Highway 52 and College Ave, due to the lack of any culverts at the intersection. Runoff will build up to a depth of approximately 2 feet before overtopping and flowing westerly along the southerly boundary of one of the residential subdivisions.

The drainage philosophy developed by the City of Ft. Lupton calls for separating the drainage of the residential sites from the golf course. The golf course will be required to retain all of their runoff on the golf course for all events up to a maximum of the 100-year storm. The residential sites will not be allowed to release any runoff onto the golf course. Detention ponding will not be required for the residential sites. These constraints set up the drainage scheme for the residential sites of routing the 100-year developed storm in storm sewer and streets. The City of Ft. Lupton will construct a regional detention pond downstream of the site in the future to include detention for the residential sites.

## III. DRAINAGE FACILITY DESIGN

The site was divided into 24 site basins and one offsite basin. Runoff from the offsite basin was discussed above. The southerly lots of basin A2 will be built up to confine the offsite flows into the State Highway 52 right-of-way while allowing the entire lot depth to drain to the proposed residential street. This regrading of the lots creates a substantial low point in the street at design points 1 and 2. The storm sewer and inlets have been sized to capture the 100-year storm from basins A1 and A2 at these two design points.

Inlets and storm sewer were also sized for the 100-year storm for basins D1, D2 and D3. This is to prevent any of the residential runoff from flowing onto the golf course as mandated by the City of Ft. Lupton. The storm sewer for these basins will be routed across the golf course and will require an easement.

Inlets and storm sewer for the remaining 19 basins were sized for the 5-year storm. Combining the 5-year and 100-year storm flows in the same storm sewer results in the pipe carrying a maximum flow of 119.29 cfs from design point 21 to the outlet. The 100-year storm for all of the contributing basins at this same point is 223.01 cfs. Subtracting 119.29 from 223.01 results in a maximum overland street flow of 103.72 cfs in the residential streets. The maximum allowable overland flow in a street sloped at 0.5% is 112 cfs for the 100-year storm according to the Ft. Lupton Standards. Although the allowable street capacity is not exceeded, a method will have

to be devised to get the 100-year overland street flow into the existing ditch running along the westerly boundary line of the site. This is in order to prevent the runoff from continuing to the west and adversely impacting adjacent land. This street flow could be routed into the ditch by forcing a sump vertical curve into the street at the westerly boundary line which would force the storm water to turn north. Another method would be to increase the inlet and storm sewer sizes to capture the entire 100-year storm sewer into the pipe - an expensive alternative.

It is our understanding that the City of Ft. Lupton will ultimately construct a regional detention pond north of the school and 100-year developed storm sewer pipe to be extended to this site. If this does not happen in a timely manner, the residential subdivision(s) will be required by the City to construct a temporary detention facility on the future apartment development land and/or the golf course. A basin by basin theoretical detention pond volume requirement table is included for information only. These volumes can be added in any manner for temporary detention pond sizing depending on the phasing of the project.

## IV. WETLAND DETERMINATION AND REVIEW

Mr. Terry McKee with the Army Corps of Engineers has been contacted to locate any wetlands on the site. His letter of response on April 4, 1996 indicated that no wetlands exist on the project. A copy of the letter is included in this report.

## V. REFERENCES

This report has been prepared in conformance with the "City of Fort Lupton Standards and Specifications for the Design and Construction of Public Improvements" dated 1994.

## VI. CONCLUSION

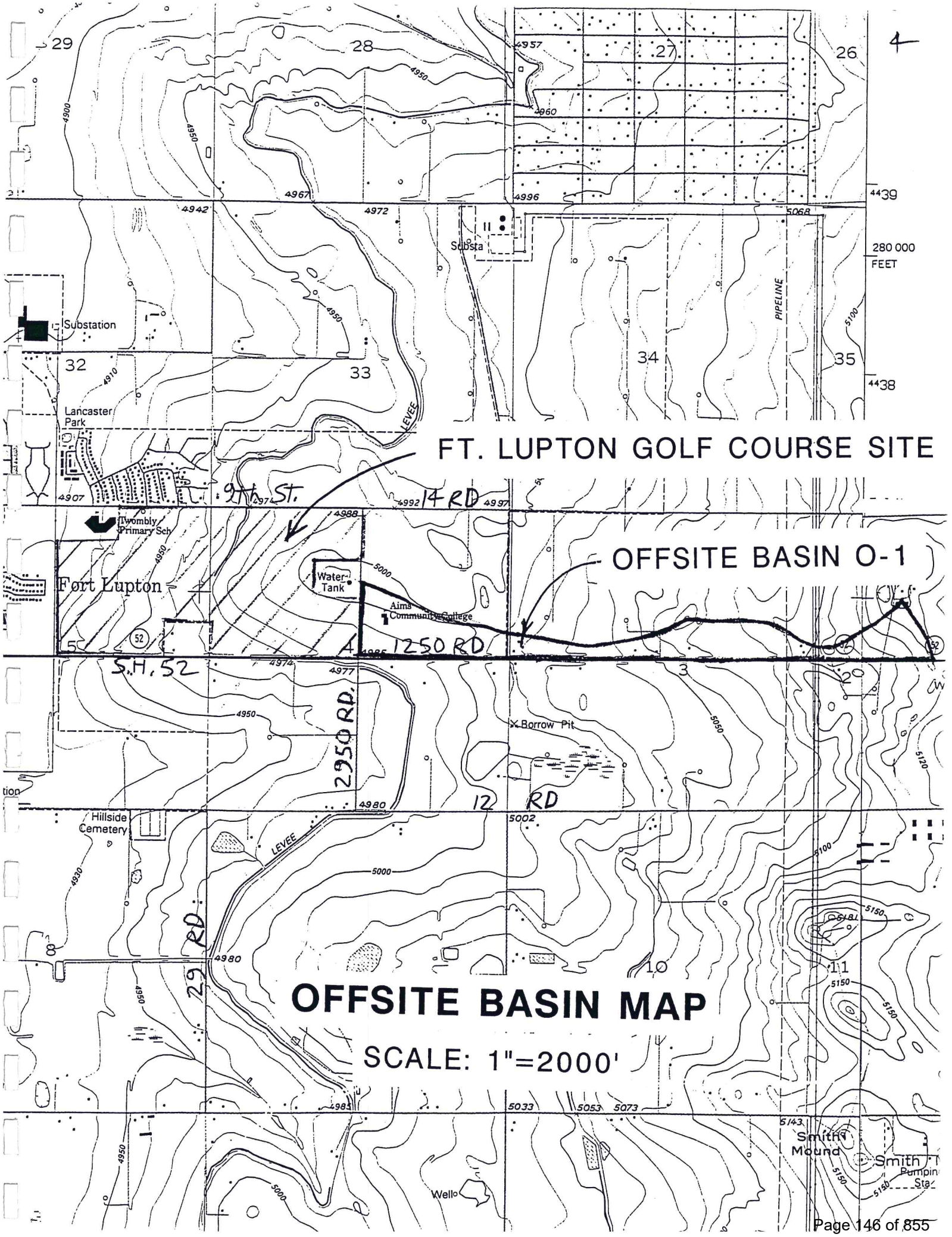
This drainage report has presented general drainage characteristics for the Ft. Lupton Master Drainage Plan, as well as some detention options and storm piping options. This report is intended to lay out the overall drainage philosophy of the project on a preliminary basis. If no changes are made to the residential sites, it can be used on a final basis with the exception of how overland street flow is transferred to the ditch at the westerly boundary line and assuming no major changes in slope are made over the existing condition. However, it is anticipated that lot layouts and street alignments will change as well as grading changes. In that case, the changes will take place with the Phase II or Phase III Drainage Reports.

If you have any questions, please feel free to call.

Respectfully submitted,

**MERRICK & COMPANY**

Mark F. Ericson, P.E.
Project Engineer


4
29
28
27
26
4957
4960
4996
4439
5068
Substa
280 000
FEET
PIPELINE
4942
4967
4972
4950
4900
5100
4438
Substation
32
33
34
35
4910
Lancaster
Park
LEVEE
FT. LUPTON GOLF COURSE SITE
9th St.
14 RD
4907
4974
4992
4997
Twombly
Primary Sch
4988
OFFSITE BASIN O-1
Fort Lupton
Water
Tank
5000
Aims
Community College
1250 RD
5
52
S.H. 52
4974
4977
4
3
2
Borrow Pit
5050
5120
2950 RD.
4980
12 RD
5002
Hillside
Cemetery
LEVEE
4930
5000
5100
5150
5181
8
29 RD
4980
10
11
OFFSITE BASIN MAP
SCALE: 1"=2000'
4985
5033
5053
5073
5143
Smith
Mound
Smith
Pumpin
Sta
Wells
4950
5000
5150

**DEPARTMENT OF THE ARMY**
CORPS OF ENGINEERS, OMAHA DISTRICT
TRI-LAKES PROJECT OFFICE, 9307 STATE HWY 121
LITTLETON, COLORADO 80123-6901

REPLY TO
ATTENTION OF

April 4, 1996

Mark F. Ericson
Merrick Engineers & Architects
P O Box 22026
Denver, Colorado 80222

Dear Mr. Ericson:

This letter concerns the Ft. Lupton Golf Course Wetlands which are located in the Northwest ¼ of Section 5, Township 1 North, Range 66 West, Weld County, Colorado.

Your project has been reviewed in accordance with Section 404 of the Clean Water Act under which the U.S. Army Corps of Engineers regulates the excavation and discharge of dredged and fill material into waters of the United States including wetlands.

Reference is made to a March 25, 1996 wetlands determination conducted by Mr. Terry McKee of this office. During Mr. McKee's site visit, it was found that no wetlands exist at this site.

This letter is to inform you that the proposed activity, assigned number 199680280, will not require a Department of the Army (DA) Permit.

Although a DA Permit will not be required for the project, this does not eliminate the requirement that other applicable federal, state, and local permits be obtained as required.

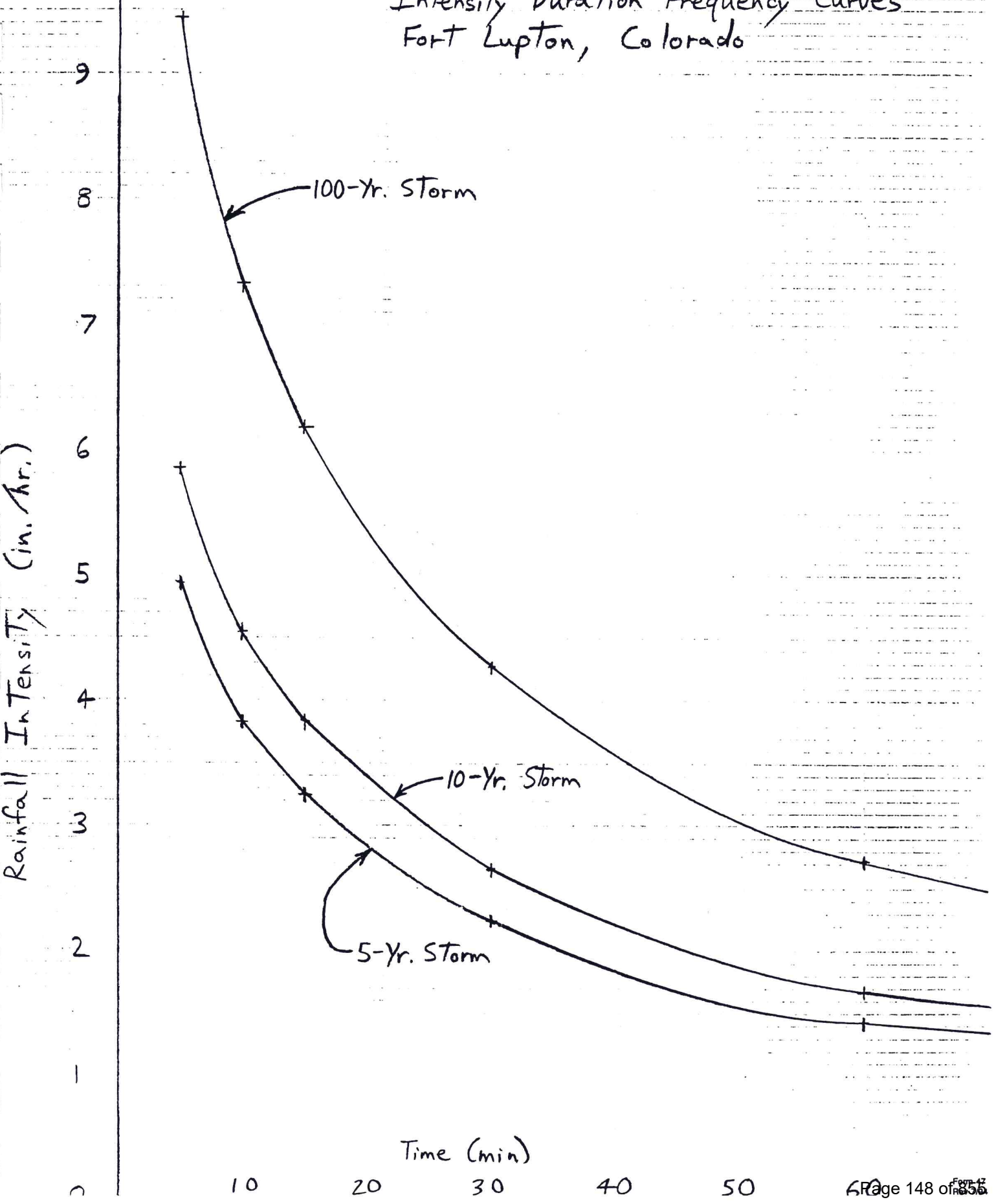
If there are any further questions concerning this matter, please feel free to contact Mr. Terry McKee of this office at 303-979-4120.

Sincerely,

Timothy T. Carey
Project Manager

Printed on Recycled Paper

# Intensity Duration Frequency Curves
## Fort Lupton, Colorado



NATIONAL FLOOD INSURANCE PROGRAM

# FIRM
## FLOOD INSURANCE RATE MAP

WELD COUNTY, COLORADO
(UNINCORPORATED AREAS)

# MAP INDEX

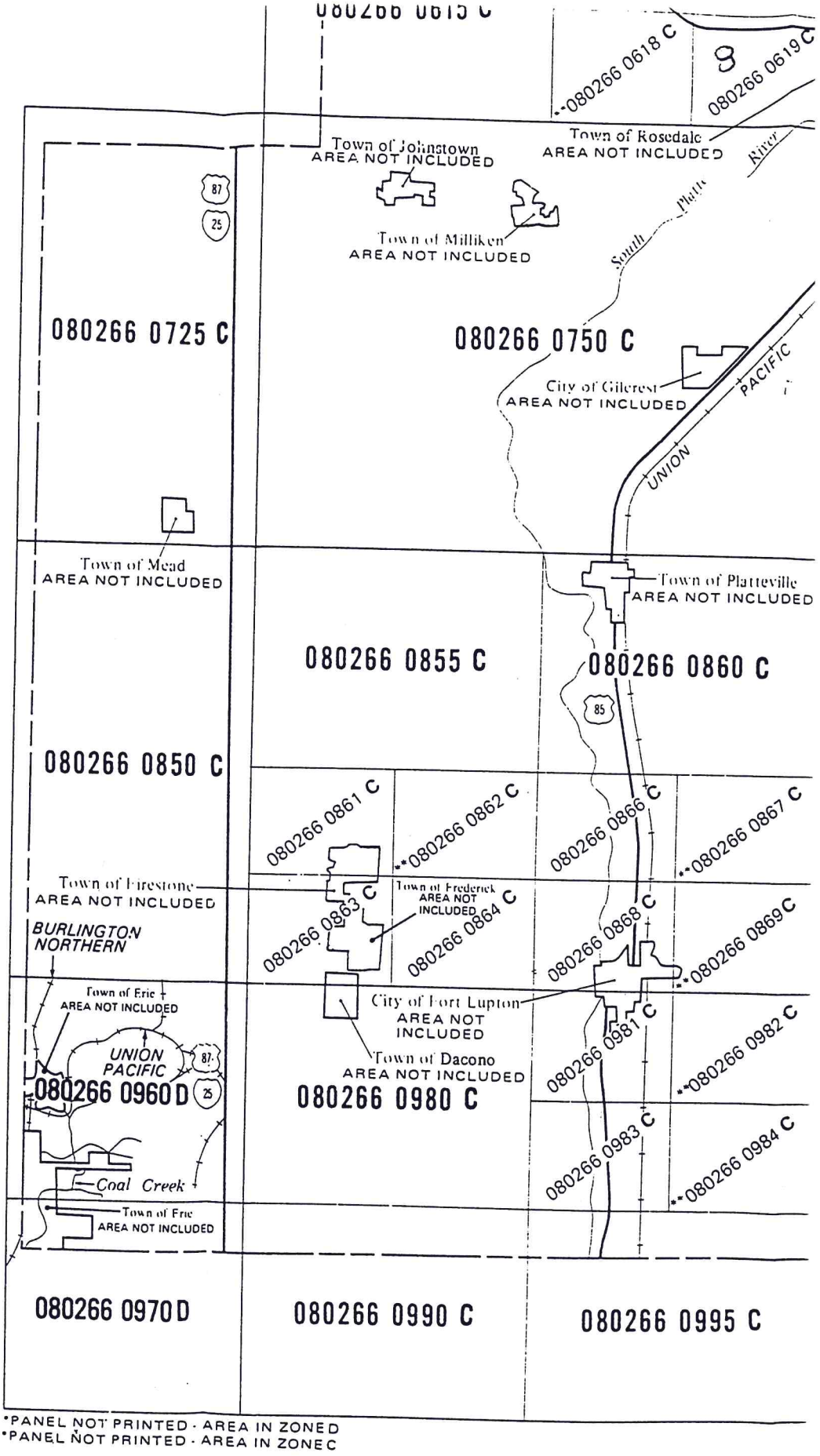
PANELS PRINTED: 75, 325, 475, 480, 485 - 489, 495, 605, 607 - 609, 615 - 617, 619, 626 -629, 635 - 639, 645, 675, 700, 725, 750, 775, 800, 825, 850, 855, 860, 861, 863, 864, 866, 868, 900, 925, 960, 970, 980, 981, 983, 990, 995, 1025

**COMMUNITY-PANEL NUMBERS**
080266 0001-1075

**MAP REVISED:**
SEPTEMBER 27, 1991

Rec ID.
G 008 000011

Ref ID.00015552




*PANEL NOT PRINTED - AREA IN ZONE D
**PANEL NOT PRINTED - AREA IN ZONE C

TABLE 3-1 (42)

RECOMMENDED RUNOFF COEFFICIENTS AND PERCENT IMPERVIOUS

| LAND USE OR SURFACE CHARACTERISTICS | PERCENT IMPERVIOUS | FREQUENCY 2 | 5 | 10 | 100 |
|---|---|---|---|---|---|
| Business: | | | | | |
| Commercial Areas | 95 | .87 | .87 | .88 | .89 |
| Neighborhood Areas | 70 | .60 | .65 | .70 | .80 |
| Residential: | | | | | |
| Single-Family | * | .40 | .45 | .50 | .60 |
| Multi-Unit (detached) | 50 | .45 | .50 | .60 | .70 |
| Multi-Unit (attached) | 70 | .60 | .65 | .70 | .80 |
| 1/2 Acre Lot or Larger | * | .30 | .35 | .40 | .60 |
| Apartments | 70 | .65 | .70 | .70 | .80 |
| Industrial: | | | | | |
| Light Areas | 80 | .71 | .72 | .76 | .82 |
| Heavy Acres | 90 | .80 | .80 | .85 | .90 |
| Parks, Cemetaries: | 7 | .10 | .18 | .25 | .45 |
| Playgrounds: | 13 | .15 | .20 | .30 | .50 |
| Schools: | 50 | .45 | .50 | .60 | .70 |
| Railroad Yard Areas | 20 | .20 | .25 | .35 | .45 |
| Undeveloped Areas: | | | | | |
| Historic Flow Analysis- Greenbelts, Agricultural | 2 | (See "Lawns") | | | |
| Offsite Flow Analysis (when land use not defined) | 45 | .43 | .47 | .55 | .65 |
| Streets: | | | | | |
| Paved | 100 | .87 | .88 | .90 | .93 |
| Gravel (Packed) | 40 | .40 | .45 | .50 | .60 |
| Drive and Walks: | 96 | .87 | .87 | .88 | .89 |
| Roofs: | 90 | .80 | .85 | .90 | .90 |
| Lawns, Sandy Soil | 0 | .00 | .01 | .05 | .20 |
| Lawns, Clayey Soil | 0 | .05 | .15 | .25 | .50 |

NOTE: These Rational Formula coefficients may not be valid for large basins.

*See Figure 2-1 for percent impervious.

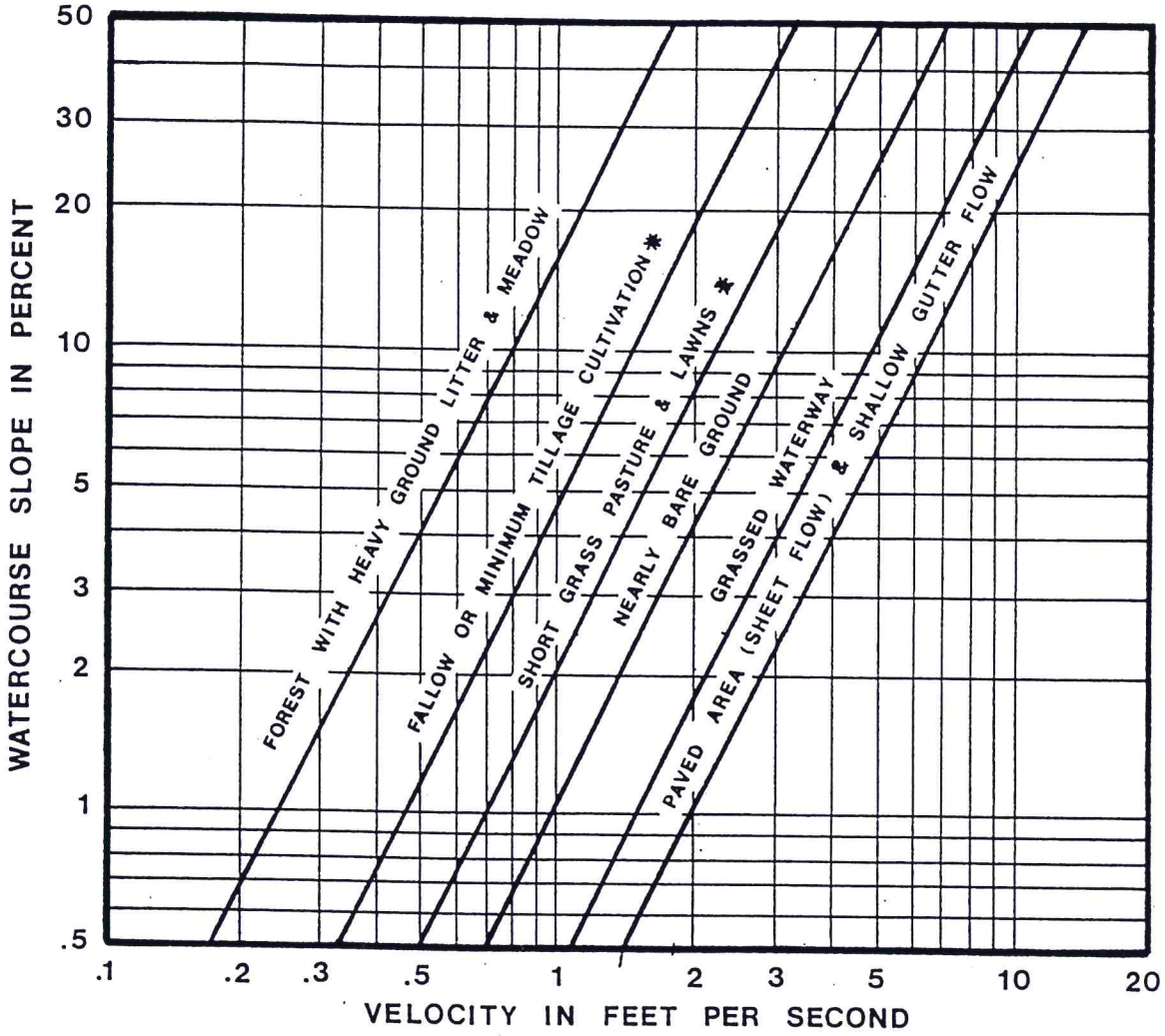



FIGURE 3-2. ESTIMATE OF AVERAGE FLOW VELOCITY FOR USE WITH THE RATIONAL FORMULA.

* MOST FREQUENTLY OCCURRING "UNDEVELOPED" LAND SURFACES IN THE DENVER REGION.

REFERENCE: "Urban Hydrology For Small Watersheds" Technical Release No. 55, USDA, SCS Jan. 1975.

CHANNEL CAPACITY CALCULATION

Ft. Lup Ton
Local Street

Cross Section: 0

NLOB: .025 STCHL: 2.5 NCHL: .016 STCHR: 47.5 NROB: .025

| STAT | ELEV | STAT | ELEV | STAT | ELEV | STAT | ELEV |
|---|---|---|---|---|---|---|---|
| 0.00 | 2.00 | 2.50 | 1.42 | 6.41 | 1.33 | 7.00 | 1.00 |
| 9.00 | 1.17 | 25.00 | 1.49 | 41.00 | 1.17 | 43.00 | 1.00 |
| 43.58 | 1.33 | 47.50 | 1.42 | 50.00 | 2.00 | 0.00 | 0.00 |

| CWSEL | EG | ELMIN | QLOB | QCH | QROB |
|---|---|---|---|---|---|
| Chan Vel | HV | KRATIO | ALOB | ACH | AROB |
| Depth | HL | Top Width | STAT-L | ST-MIDCH | STAT-R |
| Discharge | OL | Froude # | CH-Slope | EG-Slope | FlowRegim |
| 2.00 | 2.799 | 1.00 | 2 | 224 | 2 |
| 7.22 | 0.80 | 0.00 | 1 | 31 | 1 |
| 1.00 | 0.00 | 50 | 0.0 | 25.0 | 50.0 |
| 227 | 0.00 | 1.57 | 0.0100 | 0.0100 | --- |

$Q_{100}$ (Max. Allowable) with Reduction = 0.8(227) = 181.6 cfs
at 1% Slope (Total Street)
= 90.8 cfs (Each Gutter)
Agrees with chart

$Q_{100}$ (Max Allowable) with Reduction
= 2(56) = 112 cfs
at 0.5% Slope (Total Street)

CHANNEL CAPACITY CALCULATION

Cross Section: 0

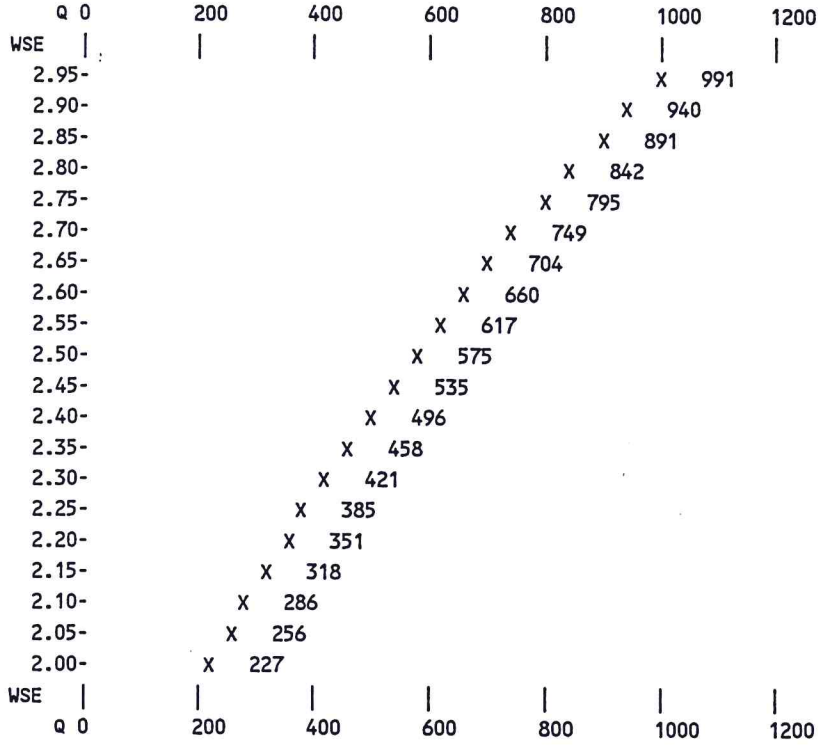
NLOB: .025 STCHL: 2.5 NCHL: .016 STCHR: 47.5 NROB: .025

| STAT | ELEV | STAT | ELEV | STAT | ELEV | STAT | ELEV |
|---|---|---|---|---|---|---|---|
| 0.00 | 2.00 | 2.50 | 1.42 | 6.41 | 1.33 | 7.00 | 1.00 |
| 9.00 | 1.17 | 25.00 | 1.49 | 41.00 | 1.17 | 43.00 | 1.00 |
| 43.58 | 1.33 | 47.50 | 1.42 | 50.00 | 2.00 | 0.00 | 0.00 |

SLOPE = .01

RATING CURVE

WATER SURFACE ELEVATION (in Feet NGVD) vs. DISCHARGE (in CFS)



# Ft. Lupton

$Q_5$ = 7.4 cfs / gutter max. @ 1% slope
= 4.2 cfs / gutter max. @ 0.5% slope
$Q_{100}$ = 92 cfs / gutter max @ 1% slope = 184 cfs Total
= 52 cfs / gutter max @ 0.5% slope = 104 cfs Total

Type R Inlet @ 0.44' Depth - Max. Q (cfs)

| Type R Size | 0.5% | 1.0% | Sump | Sump @ 12" |
|---|---|---|---|---|
| 5' | 3.1 | 3.4 | 4.2 | 11.8 |
| 10' | 4.2 | 5.7 | 8.5 | 23.9 |
| 15' | 4.6 | 6.5 | 13.9 | 28.9 |

# CUHP Input

## Offsite Basin O-1 - Historic

Area = 137.74 ac. = 0.215 SM

L = 1.89 mi.

Lc = 0.91 mi.

% Impervious = 2%

Slope = (5135 - 4985) / 10,000 = 0.015

Tc = N/A

Dep. Storage Pervious = 0.40 in.

Dep. Storage Impervious = 0.100 in.

Initial Infiltration = 3.000 in. Clay Soils

Decay = .0018

Final Infiltration = 0.500 in.

## Computer Results

Input File HFT0110Ø0.CHI

$Q_{100}$ = 98 cfs at $T_p$ = 70 min.

Input File HFT0100S.CHI

$Q_5$ = 26 cfs at $T_p$ = 70 min.

CUHP

HFT01005.CHI 15

```
2      FT. LUPTON OFFSITE BASIN O-1 - Historic Conditions - 8/28/96
01005-YEAR  005 1.42                                    0.000.000.000.00

70 1 15.0         1BASIN O-1*
.2151.8900.910 2.000.015 0.00 0.400.1003.000.00180.5000     0
E
```

U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE AT TIME HFT01005.CHO

16

CUHPE/PC VERSION MODIFIED IN JANUARY 1985

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

FT. LUPTON OFFSITE BASIN O-1 - Historic Conditions - 8/28/96

BASIN ID: -- BASIN COMMENT: BASIN O-1*

| AREA OF BASIN (SQMI) | LENGTH OF BASIN (MI) | DIST TO CENTROID (MI) | IMPERVIOUS AREA (PCT) | SLOPE (FT/FT) | UNIT DURATION (MIN) |
|---|---|---|---|---|---|
| .22 | 1.89 | .91 | 2.00 | .0150 | 5.00 |

| COEFFICIENT (REFLECTING TIME TO PEAK) | COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF) |
|---|---|
| .156 | .265 |

CALCULATED UNIT HYDROGRAPH

| TIME TO PEAK (MIN) | PEAK RATE OF RUNOFF (CFS/SQMI) | UNIT HYDROGRAP PEAK (CFS) | VOLUME OF RUNOFF (AF) |
|---|---|---|---|
| 35.68 | 306.80 | 65.96 | 11.47 |

WIDTH AT 50 = 98. MIN. WIDTH AT 75 = 51. MIN. K50 = .22 K75 = .30

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .40 IN. MAX. IMPERVIOUS RET. = .10 IN.
INFILTRATION = 3.00 IN./HR. DECAY = .00180/SECOND FNINFL = .50 IN./HR.

| TIME | UNIT HYDROGRAPH | TIME | UNIT HYDROGRAPH | TIME | UNIT HYDROGRAPH |
|---|---|---|---|---|---|
| 0. | 0. | 110. | 34. | 220. | 15. |
| 5. | 7. | 115. | 32. | 225. | 14. |
| 10. | 20. | 120. | 31. | 230. | 14. |
| 15. | 35. | 125. | 30. | 235. | 13. |
| 20. | 48. | 130. | 29. | 240. | 13. |
| 25. | 58. | 135. | 28. | 245. | 12. |
| 30. | 64. | 140. | 27. | 250. | 12. |
| 35. | 66. | 145. | 26. | 255. | 11. |
| 40. | 65. | 150. | 25. | 260. | 11. |
| 45. | 62. | 155. | 24. | 265. | 10. |
| 50. | 58. | 160. | 23. | 270. | 10. |
| 55. | 54. | 165. | 22. | 275. | 10. |
| 60. | 50. | 170. | 21. | 280. | 9. |
| 65. | 48. | 175. | 21. | 285. | 9. |
| 70. | 49. | 180. | 20. | 290. | 9. |
| 75. | 48. | 185. | 19. | 295. | 8. |
| 80. | 46. | 190. | 18. | 300. | 8. |
| 85. | 44. | 195. | 18. | 305. | 8. |
| 90. | 42. | 200. | 17. | 310. | 7. |
| 95. | 40. | 205. | 16. | 315. | 0. |

```
100.        38.    *   210.        16.    *     0.        0.    *
105.        36.    *   215.        15.    *     0.        0.    *
1       BASIN ID:          --  BASIN COMMENT:  BASIN 0-1*
```

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 005-YEAR

| TIME (MIN.) | INCREMENT RAINFALL (IN) | TOTAL EXCESS PRECIP | STORM HYDROGRAPH (CFS) | * | TIME (MIN.) | INCREMENT RAINFALL (IN) | TOTAL EXCESS PRECIP | STORM HYDROGRAPH (CFS) | * |
|---|---|---|---|---|---|---|---|---|---|
| 0. | .00 | .000 | 0. | * | 170. | .00 | .000 | 8. | * |
| 5. | .03 | .000 | 0. | * | 175. | .00 | .000 | 7. | * |
| 10. | .05 | .000 | 0. | * | 180. | .00 | .000 | 7. | * |
| 15. | .12 | .002 | 0. | * | 185. | .00 | .000 | 7. | * |
| 20. | .22 | .004 | 0. | * | 190. | .00 | .000 | 7. | * |
| 25. | .35 | .072 | 1. | * | 195. | .00 | .000 | 6. | * |
| 30. | .18 | .133 | 3. | * | 200. | .00 | .000 | 6. | * |
| 35. | .08 | .035 | 6. | * | 205. | .00 | .000 | 6. | * |
| 40. | .06 | .018 | 9. | * | 210. | .00 | .000 | 6. | * |
| 45. | .05 | .008 | 13. | * | 215. | .00 | .000 | 5. | * |
| 50. | .05 | .009 | 15. | * | 220. | .00 | .000 | 5. | * |
| 55. | .04 | .001 | 17. | * | 225. | .00 | .000 | 5. | * |
| 60. | .04 | .001 | 18. | * | 230. | .00 | .000 | 5. | * |
| 65. | .04 | .001 | 18. | * | 235. | .00 | .000 | 5. | * |
| 70. | .04 | .002 | 17. | * | 240. | .00 | .000 | 5. | * |
| 75. | .04 | .001 | 17. | * | 245. | .00 | .000 | 4. | * |
| 80. | .03 | .001 | 16. | * | 250. | .00 | .000 | 4. | * |
| 85. | .03 | .001 | 15. | * | 255. | .00 | .000 | 4. | * |
| 90. | .03 | .001 | 14. | * | 260. | .00 | .000 | 4. | * |
| 95. | .03 | .001 | 14. | * | 265. | .00 | .000 | 4. | * |
| 100. | .02 | .000 | 14. | * | 270. | .00 | .000 | 4. | * |
| 105. | .02 | .000 | 13. | * | 275. | .00 | .000 | 3. | * |
| 110. | .02 | .000 | 13. | * | 280. | .00 | .000 | 3. | * |
| 115. | .02 | .000 | 12. | * | 285. | .00 | .000 | 3. | * |
| 120. | .02 | .000 | 12. | * | 290. | .00 | .000 | 3. | * |
| 125. | .00 | .000 | 11. | * | 295. | .00 | .000 | 3. | * |
| 130. | .00 | .000 | 11. | * | 300. | .00 | .000 | 3. | * |
| 135. | .00 | .000 | 10. | * | 305. | .00 | .000 | 3. | * |
| 140. | .00 | .000 | 10. | * | 310. | .00 | .000 | 3. | * |
| 145. | .00 | .000 | 9. | * | 315. | .00 | .000 | 3. | * |
| 150. | .00 | .000 | 9. | * | 320. | .00 | .000 | 2. | * |
| 155. | .00 | .000 | 9. | * | 325. | .00 | .000 | 2. | * |
| 160. | .00 | .000 | 8. | * | 330. | .00 | .000 | 2. | * |
| 165. | .00 | .000 | 8. | * | 335. | .00 | .000 | 2. | * |

TOTAL PRECIP. = 1.64 (1-HOUR RAIN = 1.42) EXECESS PRECIP. = .293 INCHES
VOLUME OF EXCESS PRECIP = 3. ACRE-FEET
PEAK Q = 18. CFS TIME OF PEAK = 65. MIN.
INFILT.= 3.00 IN/HR DECAY = .00180 FNINF = .50 IN/HR
MAX.PERV.RET.= .40 IN. MAX.IMP.RET.= .10 IN.

1 U.D.F.C.D. CUHPD RUNOFF ANALYSIS EXECUTED ON DATE AT TIME

CUHPE/PC VERSION MODIFIED IN JANUARY 1985 TO WRITE OUTPUT FILE OF STORM HYDROGRAPHS FOR SUBSEQUENT USE WITH MULTI-PLAN RIVER ROUTING ROUTINES OF HEC-1

FT. LUPTON OFFSITE BASIN O-1 - Historic Conditions - 8/28/96

NO HYDROGRAPH VALUES WERE WRITTEN TO AN OUTPUTFILE FOR THIS RUN OF CUHPD.

CUHP

19

FT. LUPTON OFFSITE BASIN O-1 - Historic Conditions - 8/28/96

HFTO11ØØ.CHI

100-YEAR 100 2.71 0.000.000.000.00

0 1 15.0 1BASIN O-1*

2151.8900.910 2.000.015 0.00 0.400.1003.000.00180.5000 0

E

U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE AT TIME HFT0110Ø.CHO

CUHPE/PC VERSION MODIFIED IN JANUARY 1985

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

FT. LUPTON OFFSITE BASIN O-1 - Historic Conditions - 8/28/96

BASIN ID: -- BASIN COMMENT: BASIN O-1*

| AREA OF BASIN (SQMI) | LENGTH OF BASIN (MI) | DIST TO CENTROID (MI) | IMPERVIOUS AREA (PCT) | SLOPE (FT/FT) | UNIT DURATION (MIN) |
|---|---|---|---|---|---|
| .22 | 1.89 | .91 | 2.00 | .0150 | 5.00 |

| COEFFICIENT (REFLECTING TIME TO PEAK) | COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF) |
|---|---|
| .156 | .265 |

CALCULATED UNIT HYDROGRAPH

| TIME TO PEAK (MIN) | PEAK RATE OF RUNOFF (CFS/SQMI) | UNIT HYDROGRAP PEAK (CFS) | VOLUME OF RUNOFF (AF) |
|---|---|---|---|
| 35.68 | 306.80 | 65.96 | 11.47 |

WIDTH AT 50 = 98. MIN. WIDTH AT 75 = 51. MIN. K50 = .22 K75 = .30

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .40 IN. MAX. IMPERVIOUS RET. = .10 IN.
INFILTRATION = 3.00 IN./HR. DECAY = .00180/SECOND FNINFL = .50 IN./HR.

| TIME | UNIT HYDROGRAPH | | TIME | UNIT HYDROGRAPH | | TIME | UNIT HYDROGRAPH | |
|---|---|---|---|---|---|---|---|---|
| 0. | 0. | * | 110. | 34. | * | 220. | 15. | * |
| 5. | 7. | * | 115. | 32. | * | 225. | 14. | * |
| 10. | 20. | * | 120. | 31. | * | 230. | 14. | * |
| 15. | 35. | * | 125. | 30. | * | 235. | 13. | * |
| 20. | 48. | * | 130. | 29. | * | 240. | 13. | * |
| 25. | 58. | * | 135. | 28. | * | 245. | 12. | * |
| 30. | 64. | * | 140. | 27. | * | 250. | 12. | * |
| 35. | 66. | * | 145. | 26. | * | 255. | 11. | * |
| 40. | 65. | * | 150. | 25. | * | 260. | 11. | * |
| 45. | 62. | * | 155. | 24. | * | 265. | 10. | * |
| 50. | 58. | * | 160. | 23. | * | 270. | 10. | * |
| 55. | 54. | * | 165. | 22. | * | 275. | 10. | * |
| 60. | 50. | * | 170. | 21. | * | 280. | 9. | * |
| 65. | 48. | * | 175. | 21. | * | 285. | 9. | * |
| 70. | 49. | * | 180. | 20. | * | 290. | 9. | * |
| 75. | 48. | * | 185. | 19. | * | 295. | 8. | * |
| 80. | 46. | * | 190. | 18. | * | 300. | 8. | * |
| 85. | 44. | * | 195. | 18. | * | 305. | 8. | * |
| 90. | 42. | * | 200. | 17. | * | 310. | 7. | * |
| 95. | 40. | * | 205. | 16. | * | 315. | 0. | * |

```
100.        38.    *   210.        16.    *    0.        0.    *
105.        36.    *   215.        15.    *    0.        0.    *
1       BASIN ID:          -- BASIN COMMENT:  BASIN O-1*
```

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 100-YEAR

| TIME (MIN.) | INCREMENT RAINFALL (IN) | TOTAL EXCESS PRECIP | STORM HYDROGRAPH (CFS) | TIME (MIN.) | INCREMENT RAINFALL (IN) | TOTAL EXCESS PRECIP | STORM HYDROGRAPH (CFS) |
|---|---|---|---|---|---|---|---|
| 0. | .00 | .000 | 0. | 180. | .00 | .000 | 43. |
| 5. | .03 | .000 | 0. | 185. | .00 | .000 | 41. |
| 10. | .08 | .000 | 0. | 190. | .00 | .000 | 40. |
| 15. | .12 | .002 | 0. | 195. | .00 | .000 | 38. |
| 20. | .22 | .004 | 0. | 200. | .00 | .000 | 37. |
| 25. | .38 | .097 | 1. | 205. | .00 | .000 | 36. |
| 30. | .68 | .626 | 6. | 210. | .00 | .000 | 34. |
| 35. | .38 | .332 | 18. | 215. | .00 | .000 | 33. |
| 40. | .22 | .172 | 35. | 220. | .00 | .000 | 32. |
| 45. | .17 | .125 | 52. | 225. | .00 | .000 | 31. |
| 50. | .14 | .093 | 68. | 230. | .00 | .000 | 30. |
| 55. | .11 | .067 | 81. | 235. | .00 | .000 | 28. |
| 60. | .11 | .067 | 90. | 240. | .00 | .000 | 27. |
| 65. | .11 | .067 | 96. | 245. | .00 | .000 | 26. |
| 70. | .05 | .013 | 98. | 250. | .00 | .000 | 25. |
| 75. | .05 | .013 | 98. | 255. | .00 | .000 | 24. |
| 80. | .03 | .001 | 96. | 260. | .00 | .000 | 24. |
| 85. | .03 | .001 | 92. | 265. | .00 | .000 | 23. |
| 90. | .03 | .001 | 89. | 270. | .00 | .000 | 22. |
| 95. | .03 | .001 | 87. | 275. | .00 | .000 | 21. |
| 100. | .03 | .001 | 85. | 280. | .00 | .000 | 20. |
| 105. | .03 | .001 | 82. | 285. | .00 | .000 | 20. |
| 110. | .03 | .001 | 79. | 290. | .00 | .000 | 19. |
| 115. | .03 | .001 | 75. | 295. | .00 | .000 | 18. |
| 120. | .03 | .001 | 72. | 300. | .00 | .000 | 17. |
| 125. | .00 | .000 | 69. | 305. | .00 | .000 | 17. |
| 130. | .00 | .000 | 66. | 310. | .00 | .000 | 16. |
| 135. | .00 | .000 | 63. | 315. | .00 | .000 | 16. |
| 140. | .00 | .000 | 60. | 320. | .00 | .000 | 15. |
| 145. | .00 | .000 | 57. | 325. | .00 | .000 | 14. |
| 150. | .00 | .000 | 55. | 330. | .00 | .000 | 14. |
| 155. | .00 | .000 | 52. | 335. | .00 | .000 | 13. |
| 160. | .00 | .000 | 50. | 340. | .00 | .000 | 8. |
| 165. | .00 | .000 | 48. | 345. | .00 | .000 | 5. |
| 170. | .00 | .000 | 46. | 350. | .00 | .000 | 4. |
| 175. | .00 | .000 | 45. | 355. | .00 | .000 | 3. |

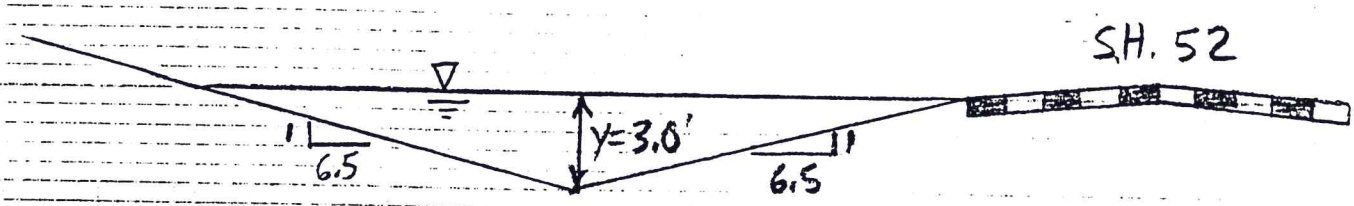
TOTAL PRECIP. = 3.13 (1-HOUR RAIN = 2.71) EXECESS PRECIP. = 1.685 INCHES
VOLUME OF EXCESS PRECIP = 19. ACRE-FEET
PEAK Q = 98. CFS TIME OF PEAK = 70. MIN.
INFILT.= 3.00 IN/HR DECAY = .00180 FNINF = .50 IN/HR
MAX.PERV.RET.= .40 IN. MAX.IMP.RET.= .10 IN.
U.D.F.C.D. CUHPD RUNOFF ANALYSIS EXECUTED ON DATE AT TIME

CUHPE/PC VERSION MODIFIED IN JANUARY 1985 TO WRITE OUTPUT FILE OF STORM HYDROGRAPHS FOR SUBSEQUENT USE WITH MULTI-PLAN RIVER ROUTING ROUTINES OF HEC-1

FT. LUPTON OFFSITE BASIN O-1 - Historic Conditions - 8/28/96

# Existing Ditch Capacity Along S.H. 52

Basin O-1 $Q_{100}$ = 98 cfs from CUHP




n = 0.035 (grass)

S = 0.1%

Y = 3.0'

$Q_{max}$ = 102 cfs > 98 cfs - O.K.

24

# DRAINAGE CALCULATIONS

| | | | | | | |
|---|---|---|---|---|---|---|
| | | **Merrick and Company** | | | | |
| | | Intensity Duration Frequency Calculations | | | | |
| | | Ft. Lupton Master Drainage Study | | | Job No. | 18012519 |
| | | | | | | |
| | | Calculated By: | | Mark Ericson | | |
| | | | | | | |
| | | | | | | |
| | | 2-YEAR | 5-YEAR | 10-YEAR | 50-YEAR | 100-YEAR |
| One-Hour Point Rainfall (In.) | | 1.00 | 1.42 | 1.68 | 2.35 | 2.71 |
| | | | | | | |
| | 5 Min. In./Hr. | 3.48 | 4.94 | 5.85 | 8.18 | 9.43 |
| | 10 Min. In./Hr. | 2.70 | 3.83 | 4.54 | 6.35 | 7.32 |
| | 15 Min. In./Hr. | 2.28 | 3.24 | 3.83 | 5.36 | 6.18 |
| | 30 Min. In./Hr. | 1.58 | 2.24 | 2.65 | 3.71 | 4.28 |
| | 60 Min. In./Hr. | 1.00 | 1.42 | 1.68 | 2.35 | 2.71 |

**Merrick and Company**

Time of Concentration

Ft. Lupton Master Drainage Study

Job No. 18012519

Calculated By: Mark Ericson Date: 8/30/96

Tc=Ti+Tt

Tc Check (Urbanized Basins)

| Sub-Basin Data | | | Initial/Overland Time (ti) | | | Travel: Time (tt) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Desig: | Area Acres | C5 | Length Feet | Slope % | Ti Min | Length Feet | Slope % | Vel. FPS | Tt Min | Comp. Tc | Total Length. Feet | Tc= (L/180)+10 Min | Fina Tc | Remarks |
| A1 | 4.63 | 0.45 | 200 | 3.3 | 11.2 | 600 | 1.8 | 2.7 | 3.7 | 14.9 | 800 | N/A | 15 | |
| A2 | 5.33 | 0.45 | 150 | 3.3 | 9.7 | 1,000 | 1.7 | 2.6 | 6.4 | 16.1 | 1,150 | 16.4 | 16 | |
| A3 | 6.38 | 0.45 | 200 | 2.0 | 13.2 | 1,180 | 1.4 | 2.3 | 8.6 | 21.7 | 1,380 | 17.7 | 18 | |
| A4 | 4.32 | 0.45 | 200 | 2.0 | 13.2 | 450 | 1.6 | 2.5 | 3.0 | 16.2 | 650 | 13.6 | 14 | |
| B1 | 6.61 | 0.45 | 200 | 2.0 | 13.2 | 1,030 | 1.1 | 2.1 | 8.2 | 21.3 | 1,230 | 16.8 | 17 | |
| B2 | 3.72 | 0.45 | 200 | 2.0 | 13.2 | 1,230 | 1.6 | 2.5 | 8.2 | 21.4 | 1,430 | 17.9 | 18 | |
| C1 | 7.67 | 0.45 | 200 | 2.0 | 13.2 | 1,900 | 1.2 | 2.2 | 14.4 | 27.6 | 2,100 | 21.7 | 22 | |
| C2 | 5.79 | 0.45 | 200 | 2.0 | 13.2 | 230 | 2.0 | 2.9 | 1.3 | 14.5 | 430 | 12.4 | 12 | |
| D1 | 3.63 | 0.45 | 140 | 2.0 | 11.0 | 680 | 1.5 | 2.4 | 4.7 | 15.7 | 820 | 14.6 | 15 | |
| D2 | 4.68 | 0.45 | 200 | 2.0 | 13.2 | 550 | 1.3 | 2.2 | 4.2 | 17.3 | 750 | 14.2 | 14 | |
| D3 | 6.01 | 0.45 | 200 | 2.0 | 13.2 | 1,150 | 1.2 | 2.2 | 8.7 | 21.9 | 1,350 | 17.5 | 18 | |
| E1 | 5.05 | 0.45 | 140 | 2.0 | 11.0 | 480 | 1.3 | 2.2 | 3.6 | 14.6 | 620 | 13.4 | 13 | |
| E2 | 1.84 | 0.45 | 200 | 2.0 | 13.2 | 200 | 1.3 | 2.2 | 1.5 | 14.7 | 400 | 12.2 | 12 | |
| F1 | 5.05 | 0.45 | 200 | 2.0 | 13.2 | 250 | 2.0 | 2.9 | 1.4 | 14.6 | 450 | 12.5 | 13 | |
| F2 | 2.02 | 0.45 | 200 | 2.0 | 13.2 | 200 | 1.5 | 2.4 | 1.4 | 14.6 | 400 | 12.2 | 12 | |
| F3 | 1.52 | 0.45 | 200 | 2.0 | 13.2 | 80 | 1.3 | 2.2 | 0.6 | 13.8 | 280 | 11.6 | 12 | |
| G1 | 8.72 | 0.45 | 200 | 2.0 | 13.2 | 1,650 | 1.8 | 2.7 | 10.2 | 23.3 | 1,850 | 20.3 | 20 | |
| G2 | 7.85 | 0.45 | 200 | 2.0 | 13.2 | 900 | 1.7 | 2.6 | 5.8 | 18.9 | 1,100 | 16.1 | 16 | |
| G3 | 2.53 | 0.45 | 200 | 2.5 | 12.2 | 250 | 2.0 | 2.9 | 1.4 | 13.7 | 450 | 12.5 | 13 | |
| H1 | 2.80 | 0.45 | 200 | 2.5 | 12.2 | 1,000 | 1.9 | 2.8 | 6.0 | 18.2 | 1,200 | 16.7 | 17 | |
| H2 | 6.24 | 0.45 | 200 | 2.0 | 13.2 | 2,100 | 1.8 | 2.7 | 13.0 | 26.1 | 2,300 | 22.8 | 23 | |
| I1 | 3.76 | 0.65 | 40 | 2.0 | 4.1 | 470 | 2.3 | 3.0 | 2.6 | 6.7 | 510 | 12.8 | 7 | |
| I2 | 5.88 | 0.65 | 200 | 3.5 | 7.6 | 650 | 2.3 | 3.0 | 3.6 | 11.2 | 850 | 14.7 | 11 | |
| I3 | 3.61 | 0.65 | 60 | 2.0 | 5.0 | 850 | 0.7 | 1.7 | 8.3 | 13.3 | 910 | 15.1 | 13 | |

**Merrick and Company**

Storm Drainage System Design

Ft. Lupton Master Drainage Study

Job No. 18012519

5-Year Storm

Calculated By: Mark Ericson

Date: 8/30/96

| Street | D.P. | Direct Runoff | | | | | | | Total Runoff | | | | Street | | Pipe | | | Travel Time | | | Type R Inlet Size |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Area Des. | Area (Ac) | Run. Coef. | Tc Min | C*A (Ac) | I In/Hr | Q CFS | Tc Sum Min | C*A | I In/Hr | Q CFS | Slop % | Flow CFS | Flow CFS | Slop % | Pipe Size | L Ft | Vel FPS | Tt Min | |
| | 1 | A1 | 4.63 | 0.45 | 15 | 2.08 | 3.24 | 6.75 | | | | | | | | | | | | | Size for Q100 |
| | 2 | A2 | 5.33 | 0.45 | 16 | 2.40 | 3.19 | 7.65 | 16 | 4.48 | 3.19 | 14.30 | | | | | | | | | Size for Q100 |
| | 3 | A3 | 6.38 | 0.45 | 18 | 2.87 | 2.99 | 8.58 | 28 | 7.35 | 2.33 | 17.13 | | | | | | 1400 | 2 | 12 | 15' |
| | 4 | A4 | 4.32 | 0.45 | 14 | 1.94 | 3.36 | 6.53 | 29 | 9.30 | 2.29 | 21.29 | | | | | | 600 | 8 | 1 | 10' |
| | 5 | B1 | 6.61 | 0.45 | 17 | 2.97 | 3.09 | 9.19 | | | | | | | | | | | | | 15' |
| | 6 | B2 | 3.72 | 0.45 | 18 | 1.67 | 2.99 | 5.01 | 18 | 4.65 | 2.99 | 13.90 | | | | | | 400 | 8 | 1 | 10' |
| | 7 | C1 | 7.67 | 0.45 | 22 | 3.45 | 2.70 | 9.32 | 31 | 17.40 | 2.21 | 38.45 | | | | | | 750 | 8 | 2 | 15' |
| | 8 | C2 | 5.79 | 0.45 | 12 | 2.61 | 3.60 | 9.38 | 34 | 20.00 | 2.08 | 41.61 | | | | | | 1500 | 8 | 3 | 15' |
| | 9 | D1 | 3.63 | 0.45 | 15 | 1.63 | 3.24 | 5.29 | | | | | | | | | | | | | Size for Q100 |
| | 10 | D2 | 4.68 | 0.45 | 14 | 2.11 | 3.36 | 7.08 | 15 | 3.74 | 3.24 | 12.12 | | | | | | 300 | 8 | 1 | Size for Q100 |
| | 11 | D3 | 6.01 | 0.45 | 18 | 2.70 | 2.99 | 8.09 | 18 | 6.44 | 2.99 | 19.27 | | | | | | 300 | 8 | 1 | Size for Q100 |
| | 12 | E1 | 5.05 | 0.45 | 13 | 2.27 | 3.48 | 7.91 | | | | | | | | | | | | | Size for Q100 |
| | 13 | E2 | 1.84 | 0.45 | 12 | 0.83 | 3.60 | 2.98 | 13 | 3.10 | 3.48 | 10.79 | | | | | | | | | Size for Q100 |
| | 14 | F1 | 5.05 | 0.45 | 13 | 2.27 | 3.48 | 7.91 | 23 | 11.82 | 2.62 | 30.96 | | | | | | 2200 | 8 | 5 | 10' |
| | 15 | F2 | 2.02 | 0.45 | 12 | 0.91 | 3.60 | 3.27 | 24 | 12.73 | 2.56 | 32.58 | | | | | | 300 | 8 | 1 | 5' |
| | 16 | F3 | 1.52 | 0.45 | 12 | 0.68 | 3.60 | 2.46 | 24 | 13.41 | 2.56 | 34.33 | | | | | | 150 | 8 | 0 | 5' |
| | 17 | G1 | 8.72 | 0.45 | 20 | 3.92 | 2.83 | 11.10 | 36 | 37.34 | 1.99 | 74.30 | | | | | | 900 | 8 | 2 | 15' |
| | 18 | G2 | 7.85 | 0.45 | 16 | 3.53 | 3.17 | 11.20 | 37 | 40.87 | 1.95 | 79.69 | | | | | | 350 | 8 | 1 | 15' |
| | 19 | G3 | 2.53 | 0.45 | 13 | 1.14 | 3.48 | 3.96 | 38 | 42.01 | 1.91 | 80.23 | | | | | | 250 | 8 | 1 | 5' |
| | 20 | H1 | 2.80 | 0.45 | 17 | 1.26 | 3.09 | 3.89 | 39 | 43.27 | 1.87 | 80.91 | | | | | | 450 | 8 | 1 | 5' |
| | 21 | H2 | 6.24 | 0.45 | 23 | 2.81 | 2.62 | 7.36 | 39 | 46.08 | 1.87 | 86.16 | | | | | | | | | 10' |
| | 22 | I1 | 3.76 | 0.65 | 7 | 2.44 | 4.43 | 10.83 | | | | | | | | | | | | | 15' |
| | 23 | I2 | 5.88 | 0.65 | 11 | 3.82 | 3.72 | 14.22 | 11 | 6.27 | 3.72 | 23.31 | | | | | | 250 | 8 | 1 | 15' |
| | 24 | I3 | 3.61 | 0.65 | 15 | 2.35 | 3.24 | 7.60 | | | | | | | | | | | | | Discharge to Ditch |

**Merrick and Company**

Storm Drainage System Design

Ft. Lupton Master Drainage Study

Job No. 18012519

100-Year Storm

Calculated By: Mark Ericson

Date: 8/30/96

| Street | D.P. | Direct Runoff | | | | | | | Total Runoff | | | | Street | | Pipe | | | Travel Time | | | Type R Inlet Size |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Area Des. | Area (Ac) | Run. Coef. | Tc Min | C*A (Ac) | I In/Hr | Q CFS | Tc Sum Min | C*A | I In/Hr | Q CFS | Slo % | Flow CFS | Flow CFS | Slop % | Pipe Size | L Ft | Vel FPS | Tt Min | |
| | 1 | A1 | 4.63 | 0.60 | 15 | 2.78 | 6.18 | 17.17 | | | | | | | | | | | | | 10' |
| | 2 | A2 | 5.33 | 0.60 | 16 | 3.20 | 5.98 | 19.12 | 16 | 5.98 | 5.98 | 35.74 | | | | | | | | | 10' |
| | 3 | A3 | 6.38 | 0.60 | 18 | 3.83 | 5.64 | 21.59 | 28 | 9.80 | 4.44 | 43.53 | | | | | | 1400 | 2 | 12 | Size for Q5 |
| | 4 | A4 | 4.32 | 0.60 | 14 | 2.59 | 6.36 | 16.49 | 29 | 12.40 | 4.37 | 54.17 | | | | | | 600 | 8 | 1 | Size for Q5 |
| | 5 | B1 | 6.61 | 0.60 | 17 | 3.97 | 5.82 | 23.08 | | | | | | | | | | | | | Size for Q5 |
| | 6 | B2 | 3.72 | 0.60 | 18 | 2.23 | 5.64 | 12.59 | 18 | 6.20 | 5.64 | 34.96 | | | | | | 400 | 8 | 1 | Size for Q5 |
| | 7 | C1 | 7.67 | 0.60 | 22 | 4.60 | 5.07 | 23.33 | 31 | 23.20 | 4.21 | 97.66 | | | | | | 750 | 8 | 2 | Size for Q5 |
| | 8 | C2 | 5.79 | 0.60 | 12 | 3.47 | 6.83 | 23.73 | 34 | 26.67 | 3.97 | 105.88 | | | | | | 1500 | 8 | 3 | Size for Q5 |
| | 9 | D1 | 3.63 | 0.60 | 15 | 2.18 | 6.18 | 13.46 | | | | | | | | | | | | | 10' |
| | 10 | D2 | 4.68 | 0.60 | 14 | 2.81 | 6.36 | 17.86 | 15 | 4.99 | 6.18 | 30.81 | | | | | | 300 | 8 | 1 | 10' |
| | 11 | D3 | 6.01 | 0.60 | 18 | 3.61 | 5.64 | 20.34 | 18 | 8.59 | 5.64 | 48.46 | | | | | | 300 | 8 | 1 | 10' |
| | 12 | E1 | 5.05 | 0.60 | 13 | 3.03 | 6.58 | 19.94 | | | | | | | | | | | | | 10' |
| | 13 | E2 | 1.84 | 0.60 | 12 | 1.10 | 6.83 | 7.54 | 13 | 4.13 | 6.58 | 27.20 | | | | | | | | | 5' |
| | 14 | F1 | 5.05 | 0.60 | 13 | 3.03 | 6.58 | 19.94 | 23 | 15.76 | 4.96 | 78.15 | | | | | | 2200 | 8 | 5 | Size for Q5 |
| | 15 | F2 | 2.02 | 0.60 | 12 | 1.21 | 6.83 | 8.28 | 24 | 16.97 | 4.84 | 82.13 | | | | | | 300 | 8 | 1 | Size for Q5 |
| | 16 | F3 | 1.52 | 0.60 | 12 | 0.91 | 6.83 | 6.23 | 24 | 17.88 | 4.84 | 86.54 | | | | | | 150 | 8 | 0 | Size for Q5 |
| | 17 | G1 | 8.72 | 0.60 | 20 | 5.23 | 5.34 | 27.94 | 36 | 49.78 | 3.84 | 191.16 | | | | | | 900 | 8 | 2 | Size for Q5 |
| | 18 | G2 | 7.85 | 0.60 | 16 | 4.71 | 5.98 | 28.17 | 37 | 54.49 | 3.77 | 205.43 | | | | | | 350 | 8 | 1 | Size for Q5 |
| | 19 | G3 | 2.53 | 0.60 | 13 | 1.52 | 6.58 | 9.99 | 38 | 56.01 | 3.70 | 207.24 | | | | | | 250 | 8 | 1 | Size for Q5 |
| | 20 | H1 | 2.80 | 0.60 | 17 | 1.68 | 5.82 | 9.78 | 39 | 57.69 | 3.63 | 209.41 | | | | | | 450 | 8 | 1 | Size for Q5 |
| | 21 | H2 | 6.24 | 0.60 | 23 | 3.74 | 4.96 | 18.57 | 39 | 61.43 | 3.63 | 223.01 | | | | | | | | | Size for Q5 |
| | 22 | I1 | 3.76 | 0.80 | 7 | 3.01 | 8.35 | 25.12 | | | | | | | | | | | | | Size for Q5 |
| | 23 | I2 | 5.88 | 0.80 | 11 | 4.70 | 7.07 | 33.26 | 11 | 7.71 | 7.07 | 54.52 | | | | | | 250 | 8 | 1 | Size for Q5 |
| | 24 | I3 | 3.61 | 0.80 | 15 | 2.89 | 6.18 | 17.85 | | | | | | | | | | | | | Discharge to Ditch |

**Merrick and Company**

Storm Drainage System Design

Ft. Lupton Master Drainage Study

SUMMARY RUNOFF TABLE

| DESIGN POINT | TRIBUTARY BASIN | CONTRI AREA (ACRES) | RUNOFF 5-YEAR STORM (CFS | PEAK 100-YEAR STORM (CFS) |
|---|---|---|---|---|
| 1 | A1 | 4.63 | 6.75 | 17.17 |
| 2 | A1-A2 | 9.96 | 14.30 | 35.74 |
| 3 | A1-A3 | 16.34 | 17.13 | 43.53 |
| 4 | A1-A4 | 20.66 | 21.29 | 54.17 |
| 5 | B1 | 6.61 | 9.19 | 23.08 |
| 6 | B1-B2 | 10.33 | 13.90 | 34.96 |
| 7 | A1-C1 | 38.66 | 38.45 | 97.66 |
| 8 | A1-C2 | 44.45 | 41.61 | 105.88 |
| 9 | D1 | 3.63 | 5.29 | 13.46 |
| 10 | D1-D2 | 8.31 | 12.12 | 30.81 |
| 11 | D1-D3 | 14.32 | 19.27 | 48.46 |
| 12 | E1 | 5.05 | 7.91 | 19.94 |
| 13 | E1-E2 | 6.89 | 10.79 | 27.20 |
| 14 | D1-F1 | 26.26 | 30.96 | 78.15 |
| 15 | D1-F2 | 28.28 | 32.58 | 82.13 |
| 16 | D1-F3 | 29.80 | 34.33 | 86.54 |
| 17 | A1-G1 | 82.97 | 74.30 | 191.16 |
| 18 | A1-G2 | 90.82 | 76.69 | 205.43 |
| 19 | A1-G3 | 93.35 | 80.23 | 207.24 |
| 20 | A1-H1 | 96.15 | 80.91 | 209.41 |
| 21 | A1-H2 | 102.39 | 86.16 | 223.01 |
| 22 | I1 | 3.76 | 10.83 | 25.12 |
| 23 | I1-I2 | 9.64 | 23.31 | 54.52 |
| 24 | I3 | 3.61 | 7.60 | 17.85 |

**Merrick and Company**

Storm Drainage System Design

Ft. Lupton Master Drainage Study — Job No. 18012519

Calculated By: Mark Ericson

Date: 8/30/96

Storm Sewer Sizing

Based on 1% Slope

| D.P. | Q5 | Q100 | Basin Q in Pipe | C5*A | i5 | C100*A | i100 | Total Q in Pipe | Req'd. RCP Pipe Dia. (in.) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 6.75 | 17.17 | 17.17 | | | | | | 24" |
| 2 | 7.65 | 19.12 | 19.12 | | | | | | 24" |
| 2 to 3 | | | | | | 5.98 | 5.98 | 35.76 | 30" |
| 3 | 8.58 | 21.59 | 8.58 | | | | | | 18" |
| 3 to 4 | | | | 4.81 | 2.29 | 5.98 | 4.37 | 37.15 | 30" |
| 4 | 6.53 | 16.49 | 6.53 | | | | | | 18" |
| 4 to Junct. | | | | 9.45 | 2.29 | 5.98 | 4.37 | 47.77 | 36" |
| 5 | 9.19 | 23.08 | 9.19 | | | | | | 18" |
| 6 | 5.01 | 12.59 | 5.01 | | | | | | 18" |
| 6 to Junct. | | | | 4.64 | 2.99 | | | 13.87 | 21" |
| Junct. to 7 | | | | 9.45 | 2.21 | 5.98 | 4.21 | 46.06 | 36" |
| 7 | 9.32 | 23.33 | 9.32 | | | | | | 18" |
| 7 to 8 | | | | 12.90 | 2.21 | 5.98 | 4.21 | 53.68 | 36" |
| 8 | 0.09 | 12.05 | 9.41 | | | | | | 18" |
| 8 to Junct. | 9.38 | 23.73 | 9.38 | 15.51 | 2.08 | 5.98 | 3.97 | 56.00 | 36" |
| 9 | 5.29 | 13.46 | 13.46 | | | | | | 21" |
| 10 | 7.08 | 17.86 | 17.86 | | | | | | 24" |
| 10 to 11 | | | | 0.00 | 0.00 | 4.99 | 6.18 | 30.84 | 27" |
| 11 | 8.09 | 20.34 | 20.34 | | | | | | 24" |
| 11 to Junct. | | | | 0.00 | 0.00 | 8.59 | 5.64 | 48.45 | 36" |
| 12 | 7.91 | 19.94 | 19.94 | | | | | | 24" |
| 13 | 2.98 | 7.54 | 7.54 | | | | | | 18" |
| 13 to Junct. | | | | 3.10 | 3.48 | 0.00 | 0.00 | 10.79 | 21" |
| Junct. to 14 | | | | 3.10 | 3.48 | 8.59 | 4.96 | 53.39 | 36" |
| 14 | 7.91 | 19.94 | 7.91 | | | | | | 18" |
| 14 to 15 | | | | 5.37 | 2.62 | 8.59 | 4.96 | 56.68 | 36" |
| 15 | 3.27 | 8.28 | 3.27 | | | | | | 18" |
| 15 to 16 | | | | 6.28 | 2.56 | 8.59 | 4.84 | 57.65 | 36" |
| 16 | 2.46 | 6.23 | 2.46 | | | | | | 18" |
| 16 to Junct. | | | | 6.96 | 2.56 | 8.59 | 4.84 | 59.39 | 36" |
| Junct. to 17 | | | | 22.47 | 1.99 | 14.57 | 3.84 | 100.66 | 42" |
| 17 | 11.10 | 27.94 | 11.10 | | | | | | 21" |
| 17 to 18 | | | | 26.39 | 1.99 | 14.57 | 3.84 | 108.46 | 48" |
| 18 | 11.20 | 28.17 | 11.20 | | | | | | 21" |
| 18 to 19 | | | | 29.92 | 1.95 | 14.57 | 3.77 | 113.27 | 48" |
| 19 | 3.96 | 9.99 | 3.96 | | | | | | 18" |
| 19 to 20 | | | | 31.44 | 1.91 | 14.57 | 3.70 | 113.96 | 48" |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 20 | 3.89 | 9.78 | 3.89 | | | | | | 18" | |
| 20 to 21 | | | | 32.70 | 1.87 | 14.57 | 3.63 | 114.04 | 48" | |
| 21 | 7.36 | 18.57 | 7.36 | | | | | | 18" | |
| 21 to Outlet | | | | 35.51 | 1.87 | 14.57 | 3.63 | 119.29 | 48" | |
| 22 | 10.83 | 25.12 | 10.83 | | | | | | 21" | |
| 23 | 14.22 | 33.26 | 14.22 | | | | | | 18" | |
| 23 to Outlet | | | | 6.27 | 3.72 | | | 23.32 | 27" | |
| 24 | 7.60 | 17.85 | N/A | | | | | | | |

32

**Merrick and Company**

Detention Pond Calculations

Ft. Lupton Master Drainage Study | Job No. 18012519

For Information Only - No Onsite Detention Is Required

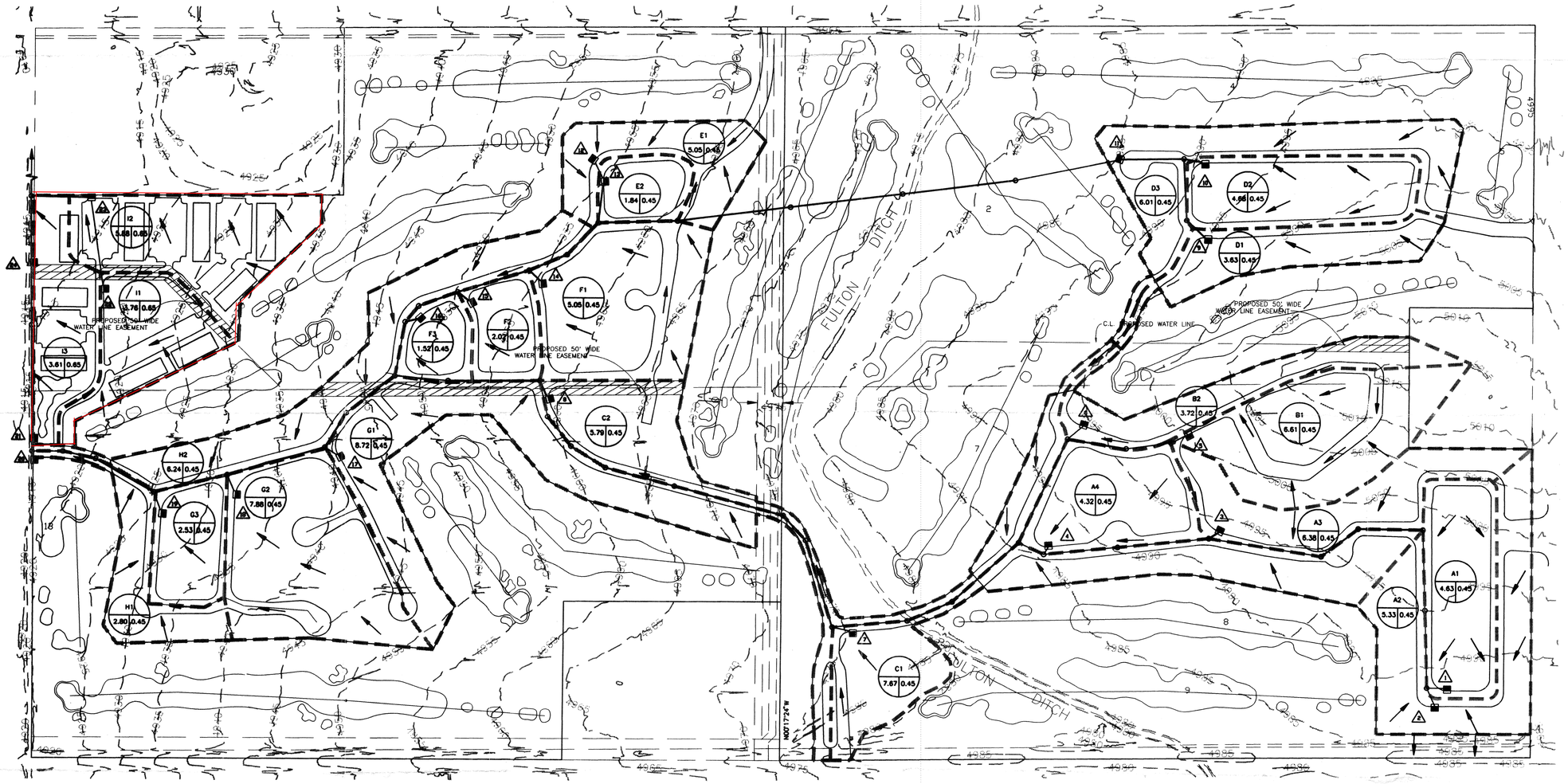
Calculated By: Mark Ericson

Formulas: K10 = (0.95I - 1.90)/100

K100 = (1.78I - 0.002I^2 - 3.56)/1000

V = KA

| Basin | Area (Acres) | Percent Imperv. (I) | K10 | K100 | V10 (Ac. Ft.) | V10 (CF) | V100 (Ac. Ft.) | V100 (CF) |
|---|---|---|---|---|---|---|---|---|
| A1 | 4.63 | 43 | 0.0390 | 0.0693 | 0.180 | 7856 | 0.321 | 13973 |
| A2 | 5.33 | 43 | 0.0390 | 0.0693 | 0.208 | 9043 | 0.369 | 16086 |
| A3 | 6.38 | 43 | 0.0390 | 0.0693 | 0.249 | 10825 | 0.442 | 19254 |
| A4 | 4.32 | 43 | 0.0390 | 0.0693 | 0.168 | 7330 | 0.299 | 13037 |
| B1 | 6.61 | 43 | 0.0390 | 0.0693 | 0.257 | 11215 | 0.458 | 19948 |
| B2 | 3.72 | 43 | 0.0390 | 0.0693 | 0.145 | 6312 | 0.258 | 11227 |
| C1 | 7.67 | 43 | 0.0390 | 0.0693 | 0.299 | 13013 | 0.531 | 23147 |
| C2 | 5.79 | 43 | 0.0390 | 0.0693 | 0.226 | 9824 | 0.401 | 17474 |
| D1 | 3.63 | 43 | 0.0390 | 0.0693 | 0.141 | 6159 | 0.251 | 10955 |
| D2 | 4.68 | 43 | 0.0390 | 0.0693 | 0.182 | 7940 | 0.324 | 14124 |
| D3 | 6.01 | 43 | 0.0390 | 0.0693 | 0.234 | 10197 | 0.416 | 18138 |
| E1 | 5.05 | 43 | 0.0390 | 0.0693 | 0.197 | 8568 | 0.350 | 15241 |
| E2 | 1.84 | 43 | 0.0390 | 0.0693 | 0.072 | 3122 | 0.127 | 5553 |
| F1 | 5.05 | 43 | 0.0390 | 0.0693 | 0.197 | 8568 | 0.350 | 15241 |
| F2 | 2.02 | 43 | 0.0390 | 0.0693 | 0.079 | 3427 | 0.140 | 6096 |
| F3 | 1.52 | 43 | 0.0390 | 0.0693 | 0.059 | 2579 | 0.105 | 4587 |
| G1 | 8.72 | 43 | 0.0390 | 0.0693 | 0.340 | 14795 | 0.604 | 26316 |
| G2 | 7.85 | 43 | 0.0390 | 0.0693 | 0.306 | 13319 | 0.544 | 23691 |
| G3 | 2.53 | 43 | 0.0390 | 0.0693 | 0.099 | 4293 | 0.175 | 7635 |
| H1 | 2.80 | 43 | 0.0390 | 0.0693 | 0.109 | 4751 | 0.194 | 8450 |
| H2 | 6.24 | 43 | 0.0390 | 0.0693 | 0.243 | 10587 | 0.432 | 18832 |
| I1 | 3.76 | 70 | 0.0646 | 0.1112 | 0.243 | 10581 | 0.418 | 18220 |
| I2 | 5.88 | 70 | 0.0646 | 0.1112 | 0.380 | 16546 | 0.654 | 28492 |
| I3 | 3.61 | 70 | 0.0646 | 0.1112 | 0.233 | 10158 | 0.402 | 17493 |
| TOTAL | 115.64 | | | | | 211006 | | 373210 |




MAGNETIC

PROJECT NAME: FORT LUPTON GOLF COURSE
CLIENT NAME: CLIENT
REVISION NO.:REV
DRAWING DATE: 4/10/97
DRAWING NAME: MDR.DWG
PROJECT NO.: 18012689

DWGNAME: I:\ACL\18012689\DRAWINGS\MDR.DWG PLOT DATE: 04/10/97 PLOT TIME: 15:21:49

| REV | REVISION DESCRIPTION | DATE | CHANGED BY | CHECKED BY | APPROVED BY |
|---|---|---|---|---|---|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DENVER, COLORADO 80222
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| | APPROVED | | |
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CLIENT PROJECT NO.: —

MERRICK PROJECT NO.: 18012689

SCALE: 1" = 200'

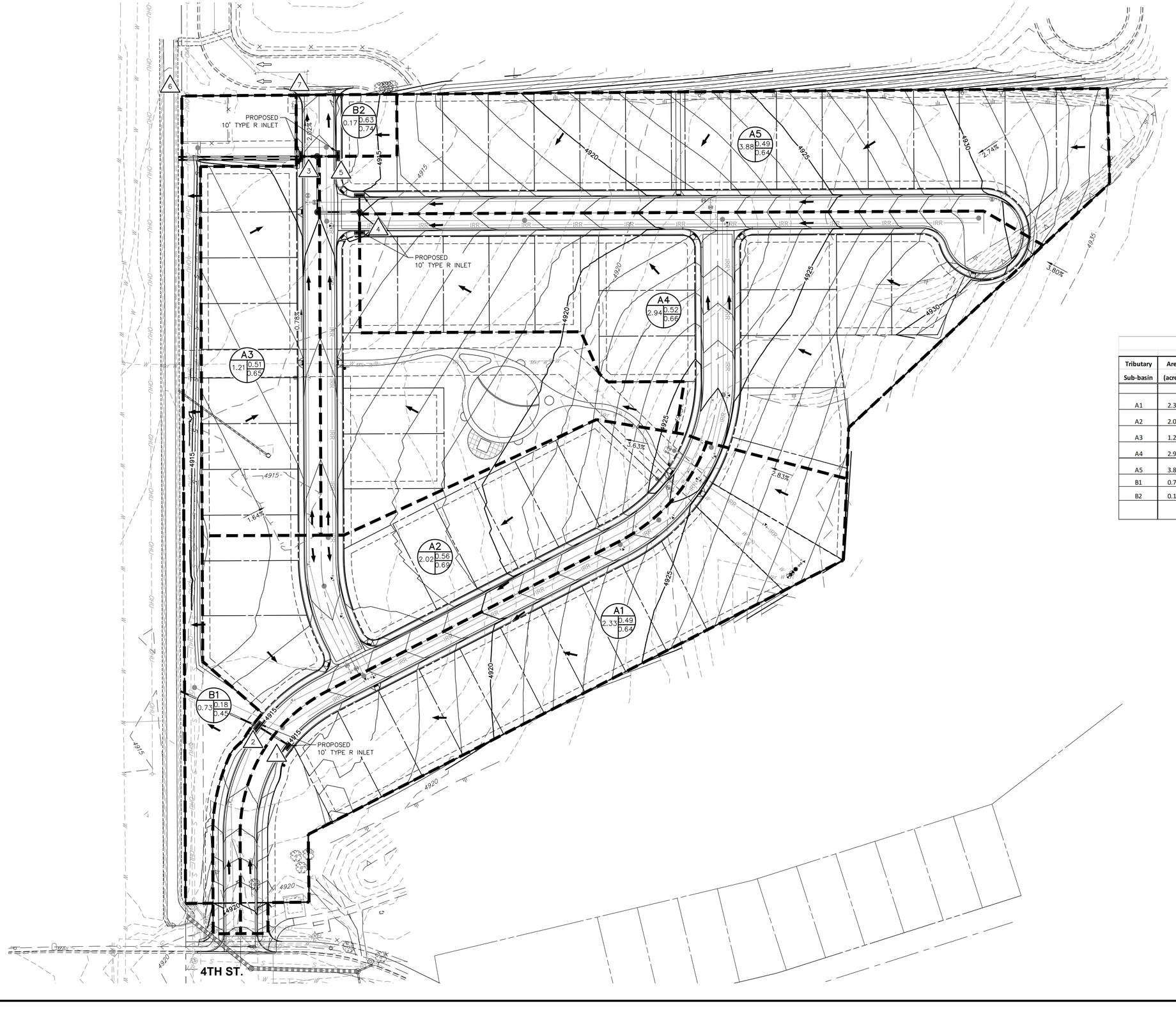
TITLE:

# FORT LUPTON MASTER DRAINAGE PLAN

| REVISION: | DRAWING NO.: | SHEET NO.: |
|---|---|---|
| A | MDR.DWG | 1 OF 1 |

# Appendix D
# Drainage Maps

# COYOTE CREEK FILING NO. 4




**BASIN SUMMARY TABLE**

| Tributary Sub-basin | Area (acres) | Percent Impervious | $C_5$ | $C_{100}$ | $t_c$ (min) | $Q_5$ (cfs) | $Q_{100}$ (cfs) |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| A1 | 2.33 | 52% | 0.49 | 0.64 | 13.0 | 3.9 | 9.8 |
| A2 | 2.02 | 61% | 0.56 | 0.69 | 11.6 | 4.1 | 9.7 |
| A3 | 1.21 | 56% | 0.51 | 0.65 | 12.0 | 2.2 | 5.4 |
| A4 | 2.94 | 56% | 0.52 | 0.66 | 11.1 | 5.7 | 13.8 |
| A5 | 3.88 | 51% | 0.49 | 0.64 | 13.7 | 6.4 | 16.1 |
| B1 | 0.73 | 7% | 0.18 | 0.45 | 13.8 | 0.4 | 2.1 |
| B2 | 0.17 | 69% | 0.63 | 0.74 | 5.0 | 0.5 | 1.2 |
| | | | | | | | |

50 25 0 50 100
ORIGINAL SCALE: 1" = 50'

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| No. | REVISION | BY | DATE |
|---|---|---|---|
| | | | |

| | |
|---|---|
| H-SCALE | 1"=50' |
| V-SCALE | 1"=X' |
| DATE | 11/17/21 |
| DESIGNED BY | AJH |
| DRAWN BY | XXX |
| CHECKED BY | |

COYOTE CREEK FILING NO. 4

PRELIMINARY DRAINAGE PLAN

SHEET 5 OF 27

JOB NO. 16093.00

# TRAFFIC IMPACT STUDY

| | |
|---|---|
| **To:** | **Roy Vestal** |
| **From:** | **Eli Farney, PE, PTOE** |
| **Date:** | **November 12, 2021** |
| **Case No.** | **Coyote Creek Filing No. 4** |

# Coyote Creek Filing No. 4
# Single-Family Detached Housing Development

59 Units

North Side of 4th Street – 1 Mile East of US Route 85

Fort Lupton, CO

**November 2021**

**Prepared By:**

**Eli Farney, PE, PTOE**
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**Trevor Millican, PE**
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# Table of Contents

1. Executive Summary……..……..4

2. Introduction ……..……5
   a. Vicinity Map
   b. Proposed Site Plan

3. Existing Conditions……7
   a. Existing Traffic Volumes
   b. 2021 Existing Traffic Volumes and Lane Geometry
   c. 2021 Existing Conditions Level of Service

4. Proposed Conditions……..10
   a. Traffic Growth Forecast
   b. Site Trip Generation
   c. Site Trip Distribution
   d. Site-Generated Traffic Volumes
   e. 2022 Opening Day Background Traffic Volumes
   f. 2040 Future Year Background Traffic Volumes
   g. 2022 Opening Day Traffic Volumes
   h. 2040 Future Year Traffic Volumes

5. Traffic Evaluation……..……17
   a. Analysis Methodology
   b. Peak Hour Definition
   c. 2022 Opening Day Intersection Level of Service
   d. 2040 Opening Day Intersection Level of Service

6. Improvements Analysis……..……..20
   a. Roadway & Intersection Modifications
   b. Traffic Signal Warrant Analysis

7. Conclusion……..……21

I. Appendices.....22
a. Appendix 1 – Existing Traffic Counts
b. Appendix 2 – Trip Generation Report
c. Appendix 3 – Synchro Reports

# List of Figures

Figure 1 – Vicinity Map.....5
Figure 2 – Proposed Site Plan & Study Intersection.....6
Figure 3 – Through Movement Tube Count Location.....7
Figure 4 – 2021 Existing Traffic Volumes and Lane Geometry.....8
Figure 6 – Site-Generated Peak HourTraffic Volumes.....11
Figure 7 – 2022 Opening Day Background Traffic Volumes.....13
Figure 8 – 2040 Future Year Background Traffic Volumes.....14
Figure 8 – 2022 Opening Day Total Traffic Volumes.....15
Figure 9 – 2040 Future Year Total Traffic Volumes.....16

# List of Tables

Table 1 – Traffic Impact Study Objectives.....4
Table 2 – Peak Hour Definition.....14
Table 3 – 2022 Intersection Level of Service.....15
Table 4 – 2022 Queue Lengths .....15

# 1 - Executive Summary

JR Engineering has prepared a comprehensive Traffic Impact Study (TIS) for the proposed Coyote Creek Filing Number 4 single-family attached housing development on the north side of 4th Street one mile east of US Route 85 in Fort Lupton, Colorado.

The contents of this TIS include the objectives stated in **Table 1**:

**Table 1 –** Traffic Impact Study Objectives

| Traffic Impact Study Objectives |
|---|
| 2021 Existing Traffic Operations |
| 2022 Opening Day Traffic Analysis |
| 2040 Future Year Traffic Analysis |

## Key Findings of this Traffic Impact Study:

| Description | Evaluation |
|---|---|
| Intersection Analysis<br>Existing Conditions | I1: 9th Street & School Access Road: All approaches Level of Service C or better<br>I2: 4th Street & Beth Avenue: All approaches Level of Service A |
| Intersection Analysis<br>2022 Opening Day | I1: 9th Street & School Access Road: All approaches Level of Service C or better<br>I2: 4th Street & Beth Avenue: All approaches Level of Service A<br>A1: 4th Street & Access/Logan: All approaches Level of Service A |
| Intersection Analysis<br>2040 Future Year | I1: 9th Street & School Access Road: All approaches Level of Service C or better<br>I2: 4th Street & Beth Avenue: All approaches Level of Service A<br>A1: 4th Street & Access/Logan: All approaches Level of Service A |
| Proposed Roadway Improvements<br>(Turn lanes, acceleration lanes, etc) | Due to low traffic volumes and high Levels of Service, no new turn lane improvements are expected to be required to support movements to and from the development. There is an existing two-way-left-turn lane on 9th Street that can be re-striped to provide a westbound left-turn lane to the access road to the site |

# 2 - Introduction

JR Engineering (JR) has completed a review of the existing and Opening Day traffic operations at the two study intersections that will serve the proposed development access points. **Figure 1** shows a vicinity map of the proposed site.

**Figure 1:** Proposed Coyote Creek Filing No. 4 Development - Vicinity Map

# Proposed Site Plan & Study Intersections

Figure 2 shows the proposed Site Plan & Study Intersection locations.

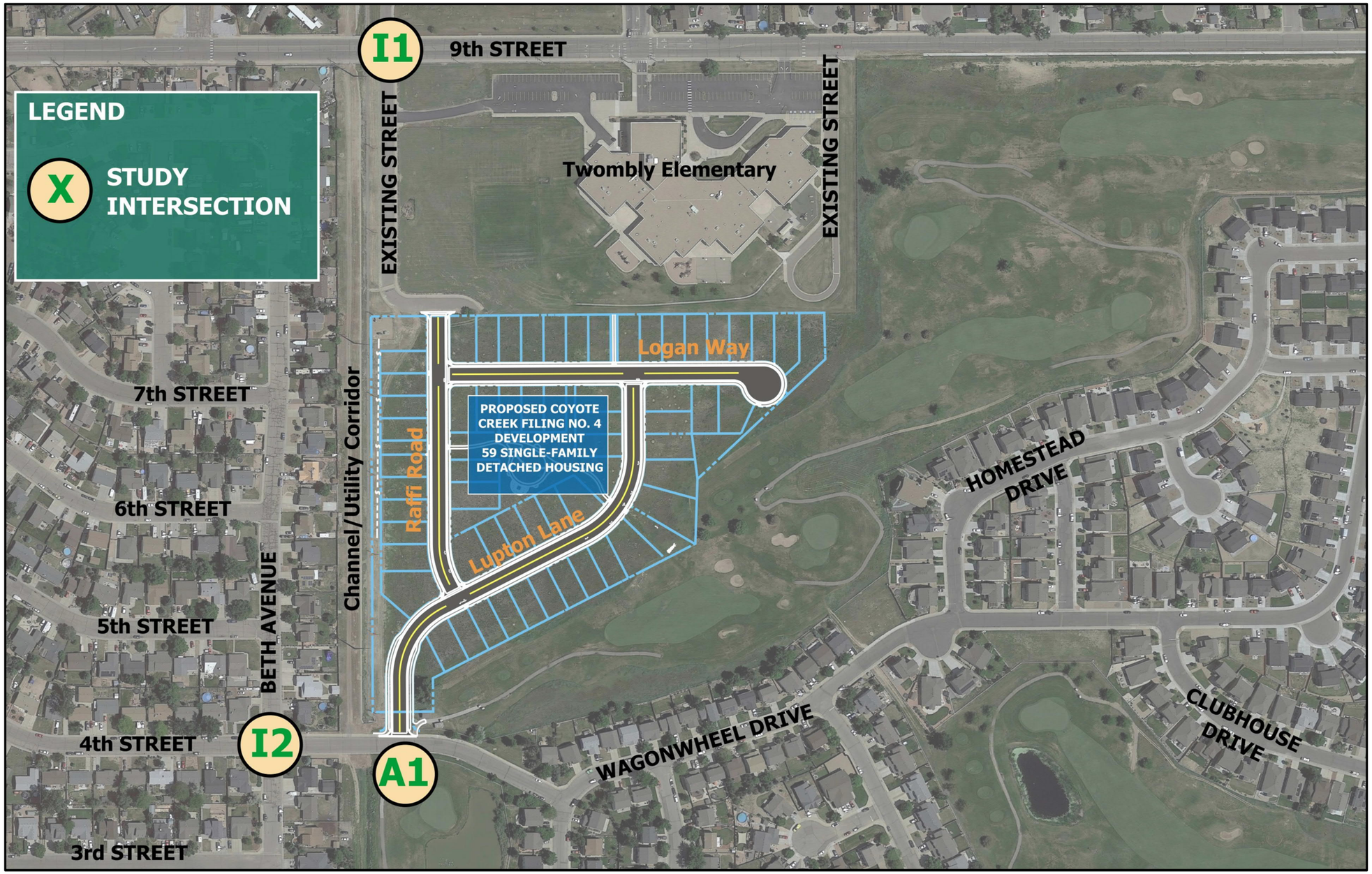



**Figure 2:** Site Plan and Study Intersection Location

# 3 – Existing Conditions

## Existing Traffic Volumes

Existing intersection turning movement traffic counts were gathered in the field by All Traffic Data at the two intersections shown in **Figure 3**. The existing turning movement traffic volumes are shown in **Figure 4**.

- **Intersection Turning Movement Counts** – 9th Street & Existing School Access Road
  - Collected on Tuesday, November 9, 2021 from 7:00 a.m. to 6:00 p.m.

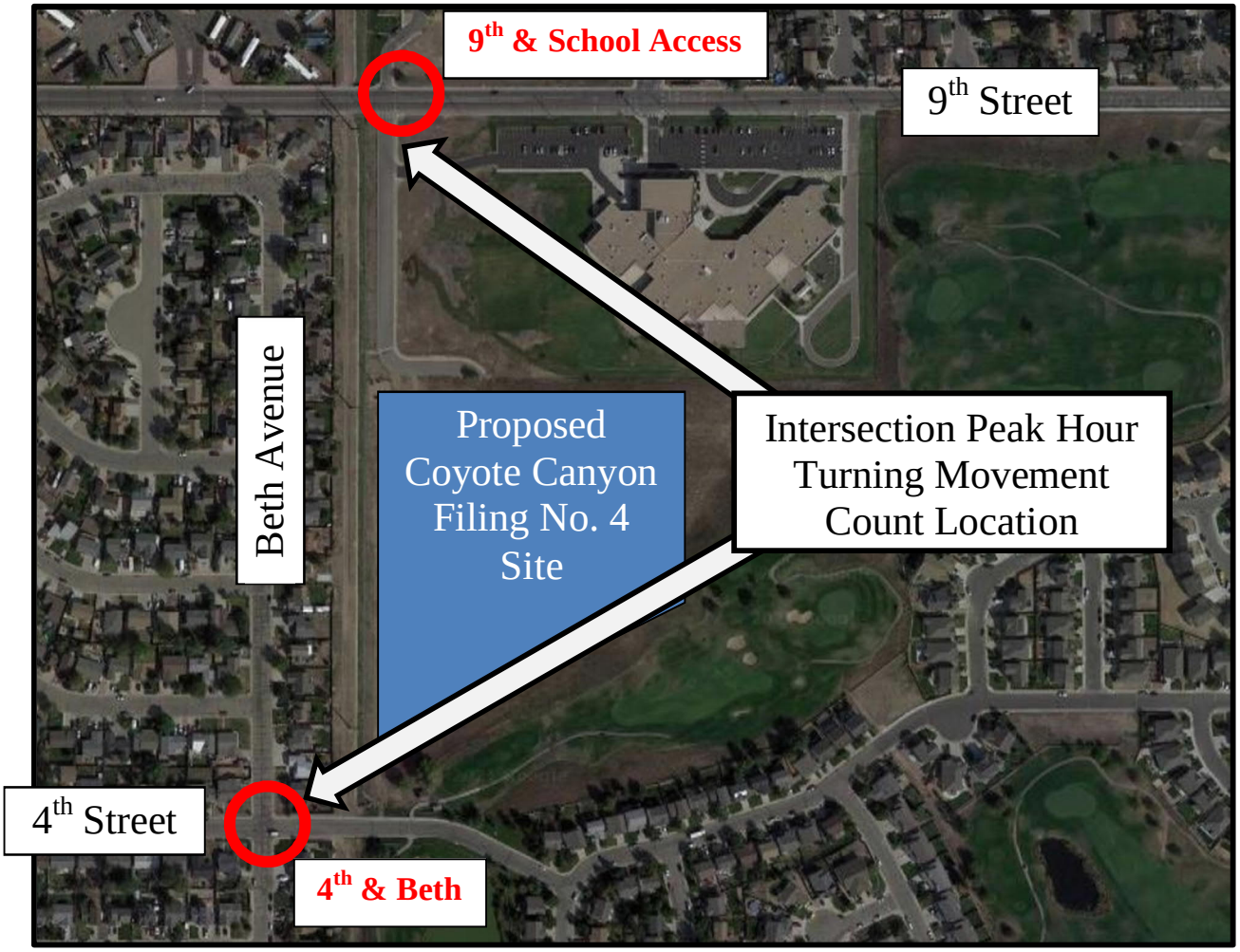



**Figure 3:** Peak Hour Intersection Turning Movement Count Locations

Traffic count data is available in **Appendix 2**

# 2021 Existing Traffic Volumes and Lane Geometry

Figure 4 shows the existing lane geometry and traffic volumes during the AM and PM peak hours.

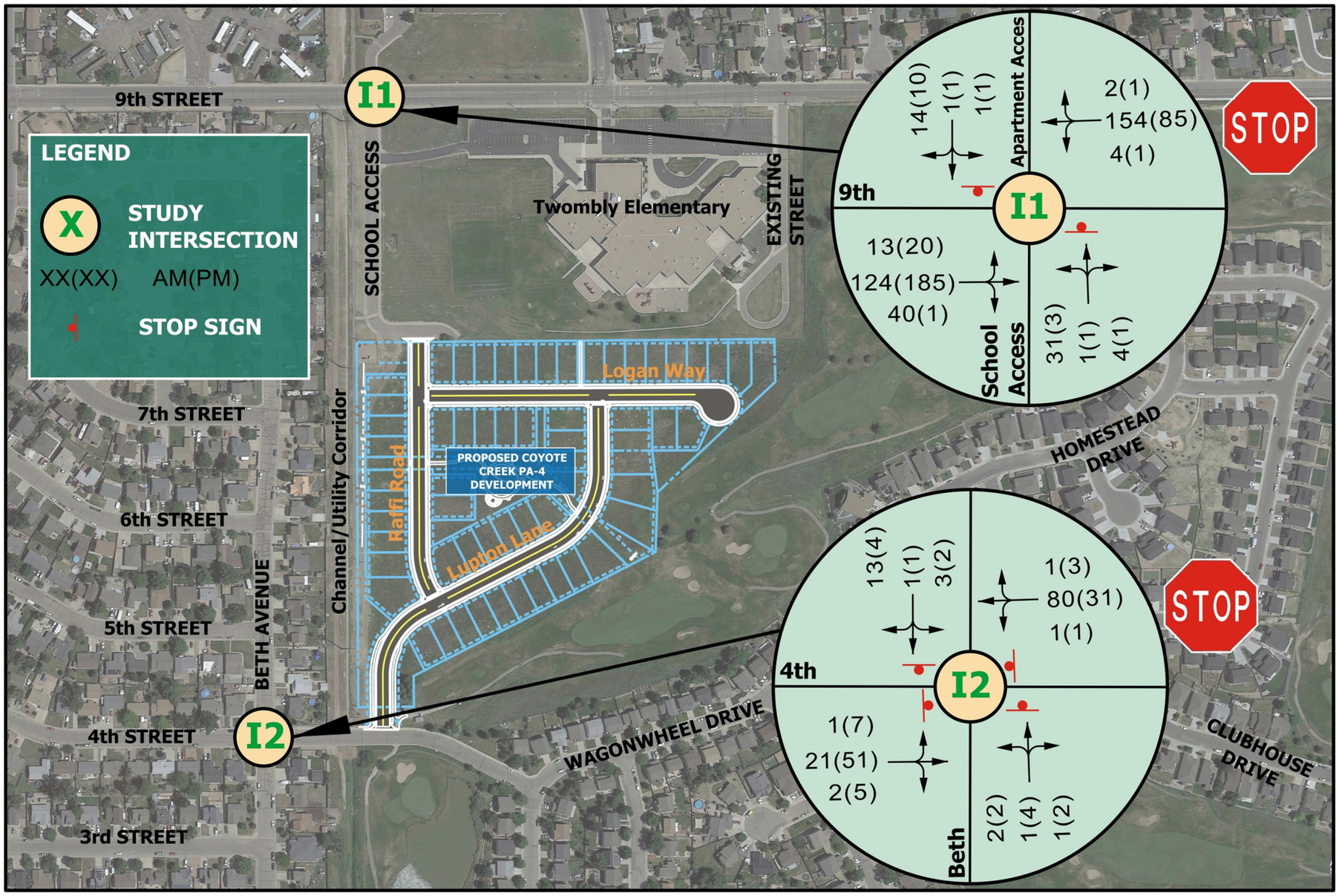



**Figure 4:** 2021 Existing Traffic Volumes

## Existing Conditions - Level of Service

The two existing intersections that will serve as the primary access points to Coyote Creek Filing Number 4 were analyzed using the intersection turning movement traffic counts taken in November 2021.

**Table 3 –** Stop Controlled Intersection Level of Service – **2021 Existing Conditions**

| Stop-Controlled Intersection | Direction | Opening Day Traffic LOS | |
|---|---|---|---|
| | | AM Peak Hour | PM Peak Hour |
| **I1** – 9th Street & School Access Road (TWO WAY STOP) | EB | N/A | N/A |
| | WB | N/A | N/A |
| | SB | B | A |
| | NB | C | B |
| **I2** – 4th Street & Beth Avenue (ALL-WAY STOP) | EB | A | A |
| | WB | A | A |
| | SB | A | A |
| | NB | A | A |

# 4 – Proposed Conditions

## Traffic Growth Forecast

The proposed Coyote Creek development generates an estimated 557 weekday trips per day and is considered a small development.

Growth of existing vehicular traffic was estimated using DRCOG 2020 and 2050 ADT estimates. The growth rate was applied to existing volumes to estimate background traffic volumes.

| STREET | GROWTH RATE | SOURCE |
|---|---|---|
| 4th Street | 3.7% | DRCOG |
| 9th Street | 3% | Estimate since no information provided by DRCOG |

## Trip Generation

The ADT and turning movement counts were estimated using the standard ITE Land Use Code 210 for Single-Family Detached based on number units. No adjustments were made for internal capture nor pass-by trips.

**The proposed single-family development of 59 units produces the following volumes based on ITE:**

| Item | Trips Generated | Description |
|---|---|---|
| Average Daily Trips (ADT) | 557 | ADT |
| AM Entering Site | 11 | AM Peak Hour |
| AM Exiting Site | 33 | AM Peak Hour |
| PM Entering Site | 37 | PM Peak Hour |
| PM Exiting Site | 21 | PM Peak Hour |

The Trip Generation report is included in **Appendix 3**.

## Trip Distribution

Based on discussions held with the City of Fort Lupton regarding the distribution of site-generated traffic, it was determined that:

- 80% of vehicles will travel to/from the south via 4th Street
- 20% of vehicles will travel to/from the north via 9th Street

# Site-Generated Trip Assignment & Distribution

Figure 5 shows the site-generated trip assignment and distribution.

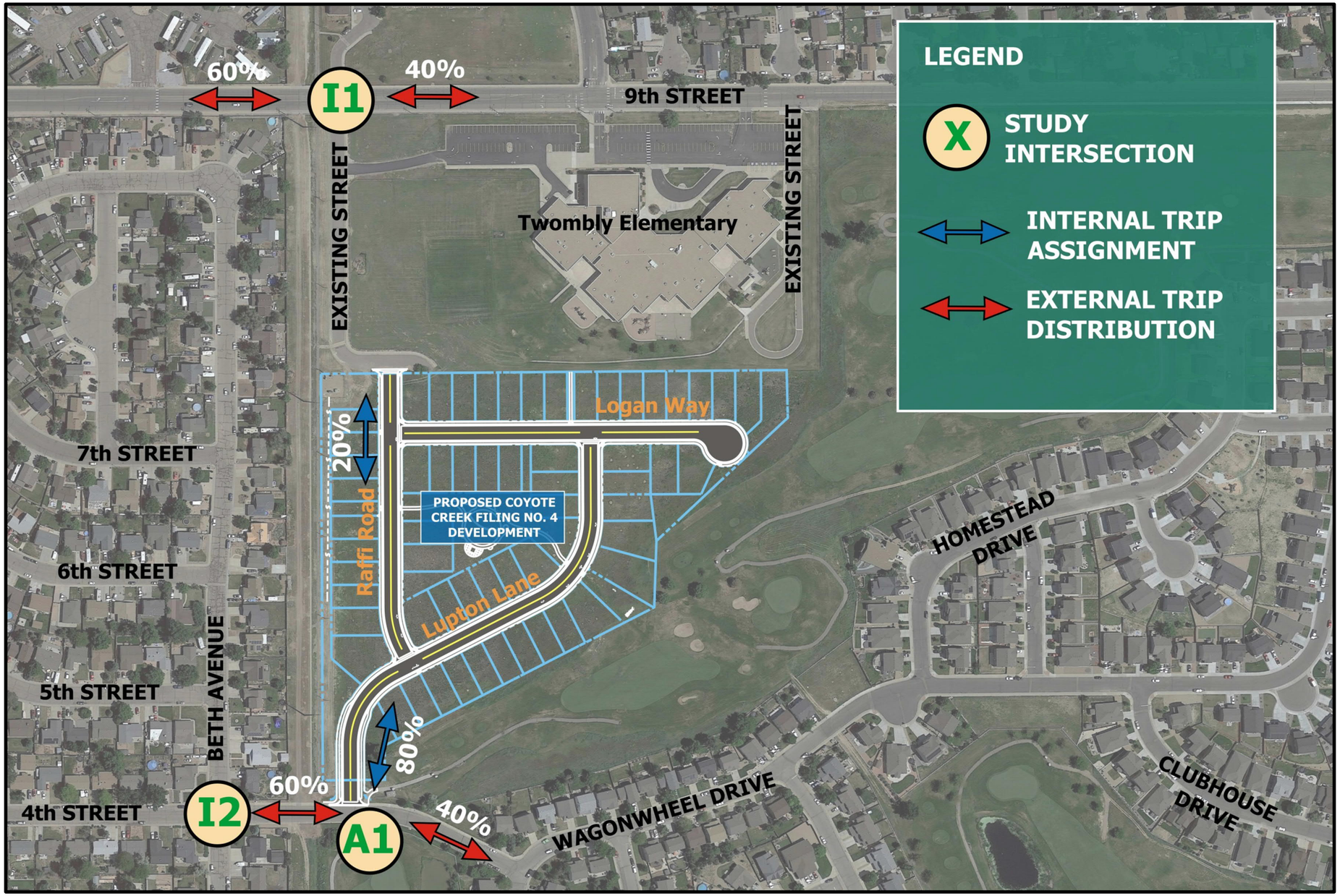



**Figure 5:** Site-Generated Trip Assignment and Distribution

## Site-Generated Peak Hour Traffic Volumes

Figure 6 shows the traffic volumes generated by the proposed development.

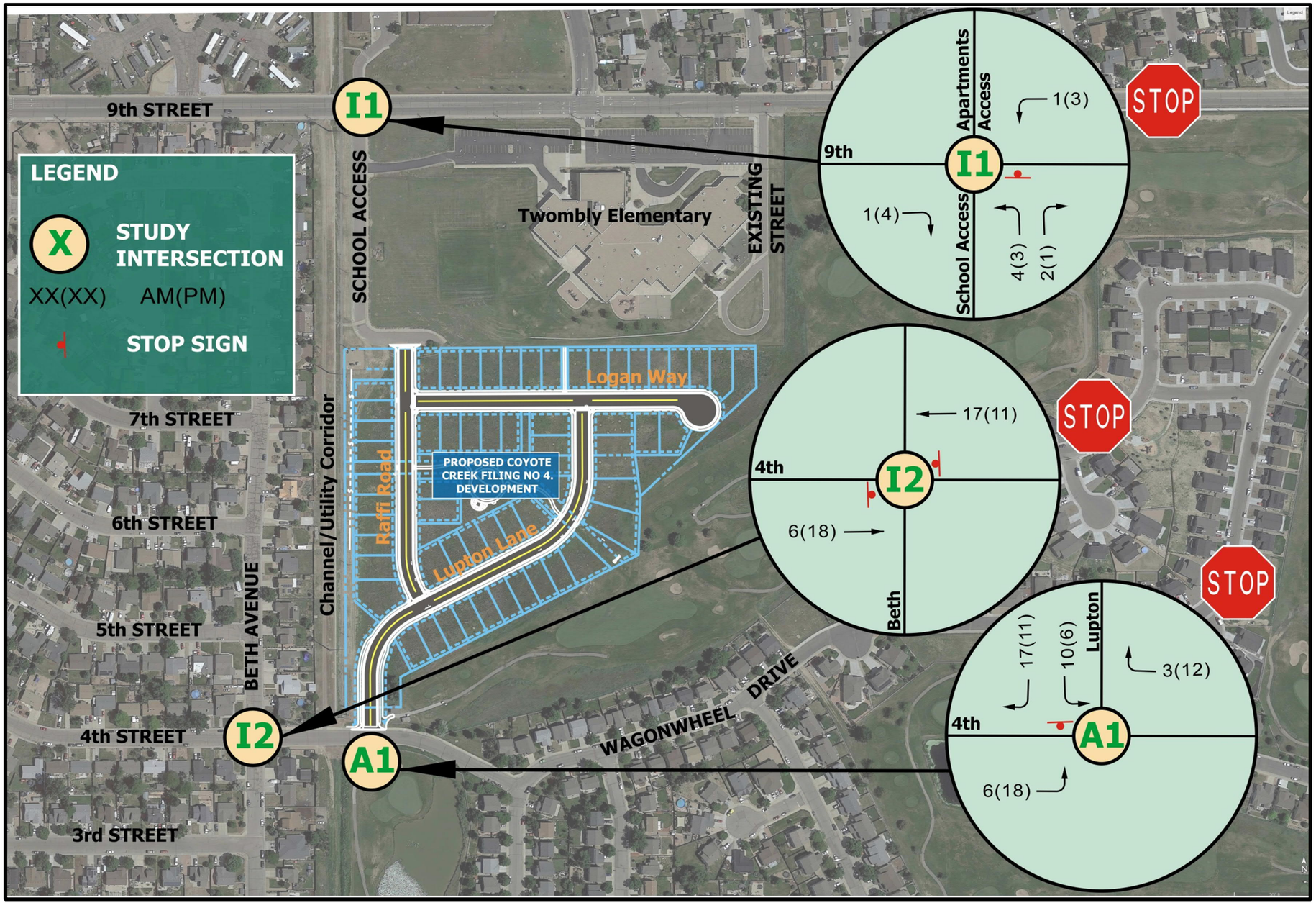



**Figure 6:** Site-Generated Traffic Volumes

## 2022 Opening Day – Peak Hour Background Traffic Volumes

Figure 7 shows the 2022 Opening Day total traffic volumes during the AM and PM peak hours.

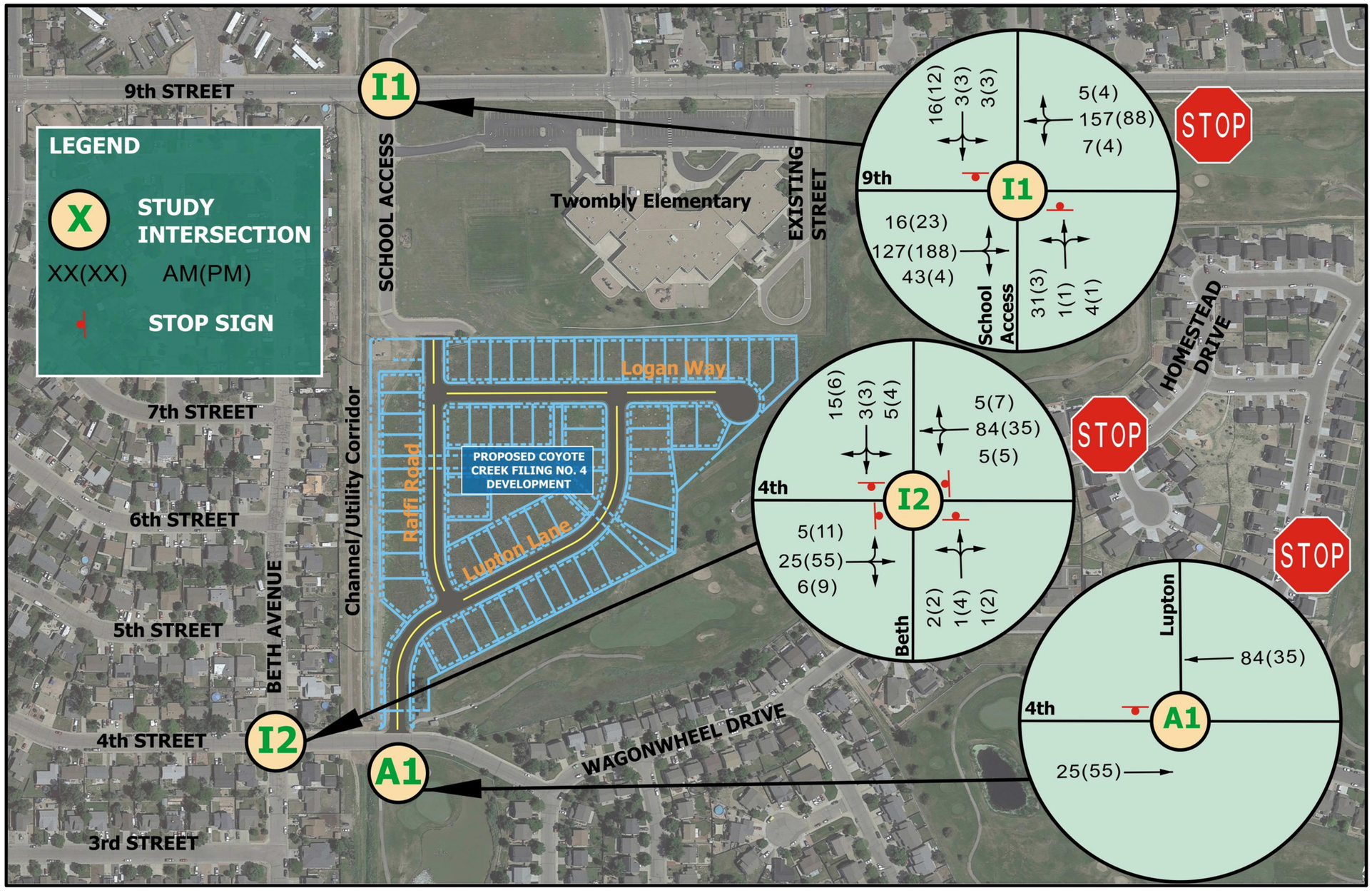



**Figure 7:** Opening Day 2022 Background Traffic Volumes

# 2040 Future Year – Peak Hour Background Traffic Volumes

**Figure 8** shows the 2040 Opening Day total traffic volumes during the AM and PM peak hours.

**Figure 8:** Future Year 2040 Background Traffic Volumes

# 2022 Opening Day – Peak Hour Total Traffic Volumes

**Figure 9** shows the 2022 Opening Day total traffic volumes during the AM and PM peak hours.

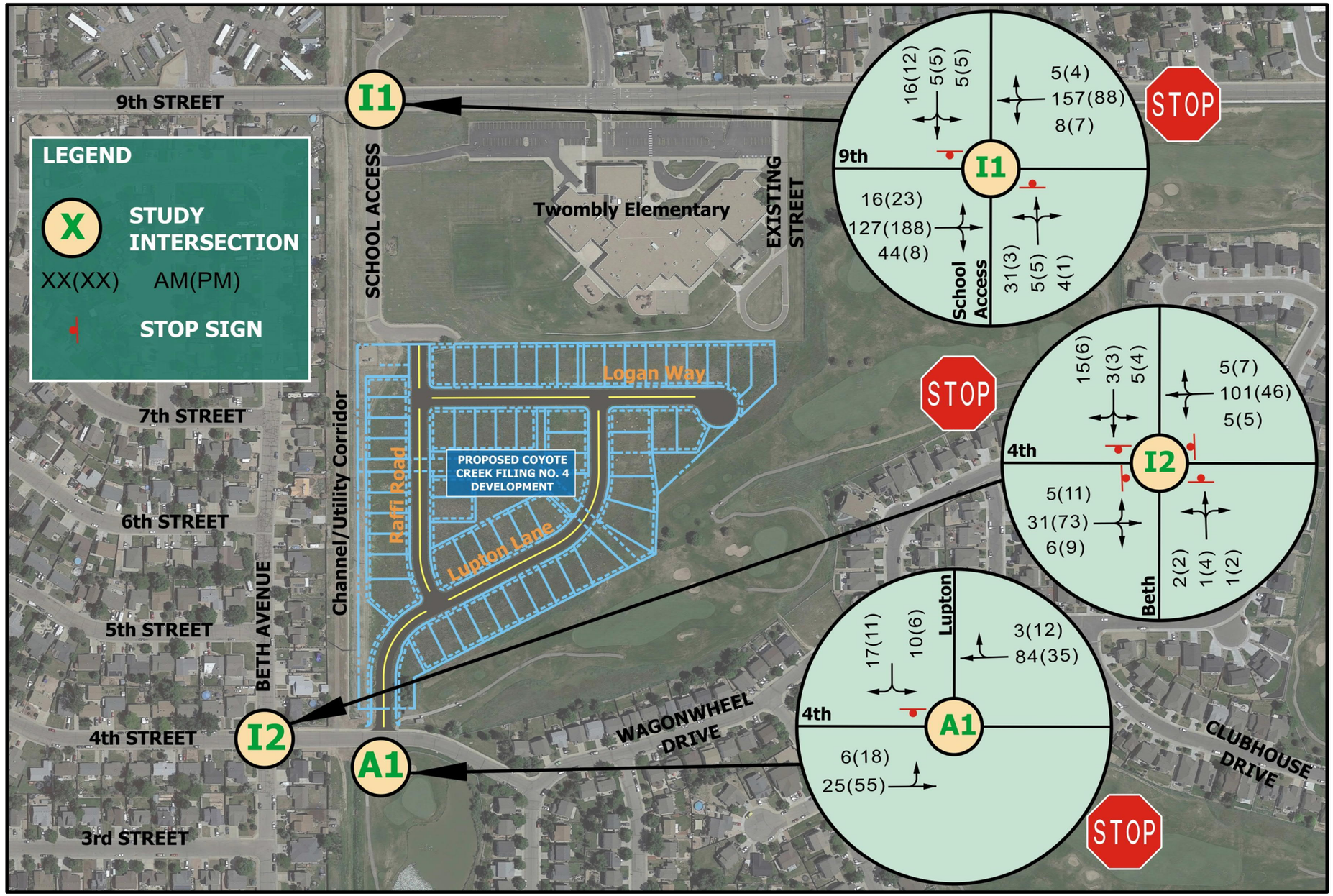



**Figure 9:** Opening Day 2022 Total Traffic Volumes

# 2040 Future Year – Peak Hour Total Traffic Volumes

Figure 10 shows the 2040 Opening Day total traffic volumes during the AM and PM peak hours.

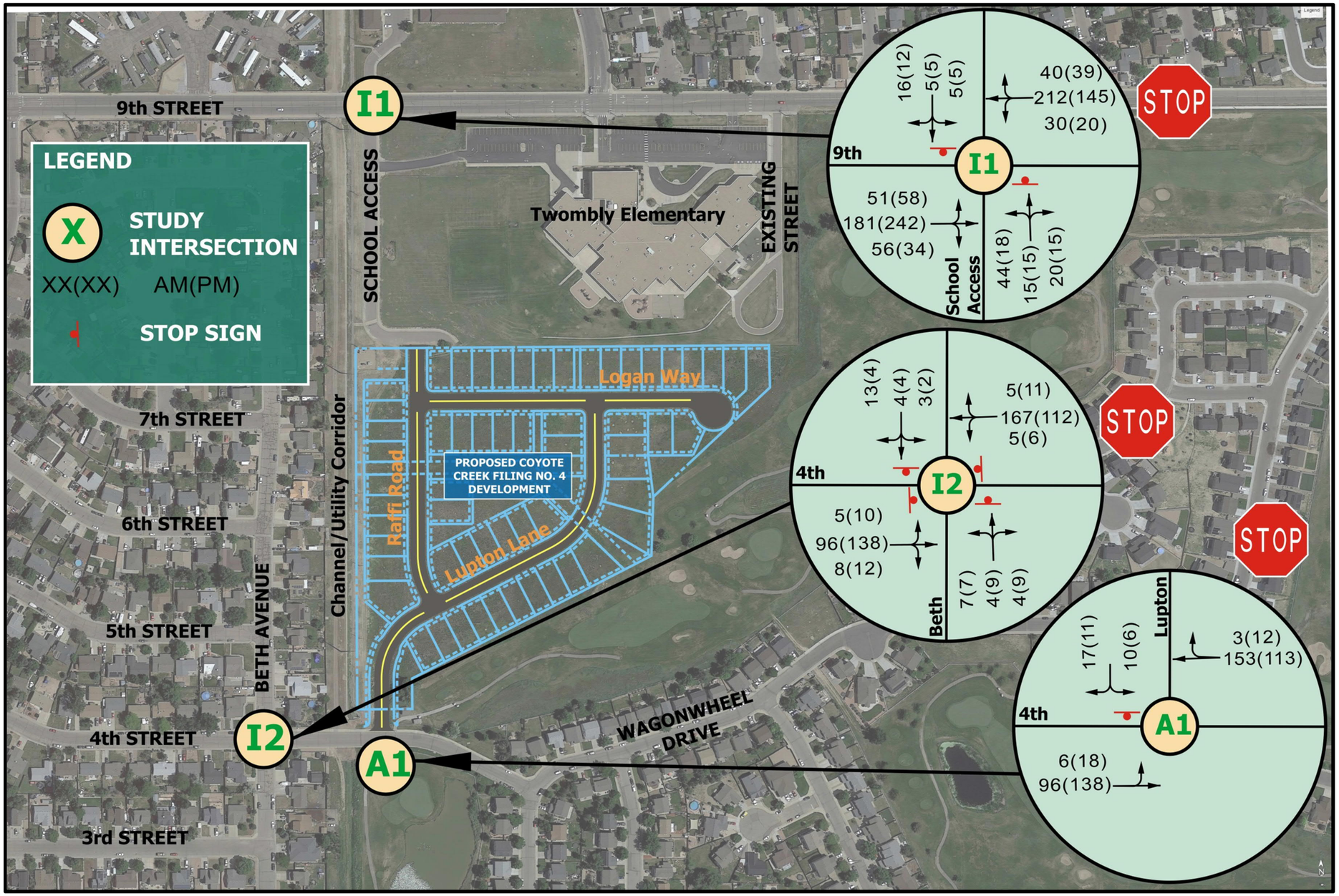



**Figure 10:** Opening Day 2040 Future Year Total Traffic Volumes

# 5 – Traffic Evaluation – Level of Service

## Analysis Methodology

The premise of the Traffic Analysis methodology is as follows:

1. Estimate traffic volumes generated by the development
2. Input estimated volumes into Synchro and analyze the Study Intersection during peak hours
3. Determine operating Level of Service for the Study Intersection during peak hours

The Study intersection was analyzed using the HCM 6th Edition methodology for:

- 2022 Opening Day
- 2040 Future Year

The Synchro report for these analyses are included in **Appendix 4**.

## Peak Hour Definition

Based on the traffic counts, **Table 2** shows the peak hours for 4th Street and 9th Street.

**Table 2 –** Peak Hour Definition

| Peak Hour | Hours |
|---|---|
| Morning (AM Peak) | 7:30 a.m. to 8:30 a.m. |
| Evening (PM Peak) | 5:00 p.m. to 6:00 p.m. |

## Study Intersections – Opening Day 2022 Level of Service

The intersections were analyzed for the 2022 Opening Day scenario. **Table 3** indicates the 2022 Level of Service for the intersection.

**Table 3 –** Stop Controlled Intersection Level of Service – **2022 Opening Day**

| Stop Controlled Intersection | Direction | Opening Day Traffic LOS | |
|---|---|---|---|
| | | AM Peak Hour | PM Peak Hour |
| I1 – 9th & Access (One-Way Stop) | EB | N/A | N/A |
| | WB | N/A | N/A |
| | NB | C | B |
| | SB | B | B |
| I2 – 4th & Beth (All-Way Stop) | EB | A | A |
| | WB | A | A |
| | NB | A | A |
| | SB | A | A |
| A1 – 4th & Logan | EB | N/A | N/A |
| | WB | N/A | N/A |
| | SB | A | A |

## Study Intersections – Future Year 2040 Level of Service

The intersections were analyzed for the 2022 Opening Day scenario. **Table 3** indicates the 2022 Level of Service for the intersection.

**Table 3 –** Stop Controlled Intersection Level of Service – **2040 Future Year**

| Stop Controlled Intersection | Direction | Opening Day Traffic LOS | |
|---|---|---|---|
| | | AM Peak Hour | PM Peak Hour |
| I1 – 9th & Access (One-Way Stop) | EB | N/A | N/A |
| | WB | N/A | N/A |
| | NB | C | C |
| | SB | B | B |
| I2 – 4th & Beth (All-Way Stop) | EB | A | A |
| | WB | A | A |
| | NB | A | A |
| | SB | A | A |
| A1 – 4th & Logan | EB | A | A |
| | WB | A | A |
| | SB | A | A |

# 6 – Improvement Analysis

## Roadway & Intersection Modifications

The existing roadways that will serve the proposed development are classified as follows:

**9th Street –** 2-Lane Urban Collector
**4th Street** – 2-Lane Minor Collector

Based on 2040 Total Traffic volumes, no new turn lanes are anticipated to be required to support the development. There is an existing two-way-left-turn lane on 9th Street that can be re-striped to provide a dedicated left-turn lane for turns into the site access road.

## Traffic Signal Warrant Analysis

A peak hour signal warrant analysis was conducted for:

- 4th & Beth
- 9th & School Access/Apartment Access

For the signal warrant analysis, 2040 Future Year traffic volumes were used.

**4th & Beth -** ***Does not meet Peak Hour Warrant in 2040***

**9th & School Access/Apartment Access -** ***Does not meet Peak Hour Warrant in 2040***

The intersection was analyzed for Warrant 3, Peak Hour according to the MUTCD. The intersection did not meet this warrant for signalization due to low traffic volumes on all approaches.

# 7 – Conclusion

The proposed development along 4th Street is expected to have no significant impact on existing infrastructure traffic operations. Below is a summary of the findings of this TIS.

## Site Generated Traffic

| Item | Trips Generated | Description |
|---|---|---|
| Average Daily Trips (ADT) | 557 | ADT |
| AM Entering Site | 11 | AM Peak Hour |
| AM Exiting Site | 33 | AM Peak Hour |
| PM Entering Site | 37 | PM Peak Hour |
| PM Exiting Site | 21 | PM Peak Hour |

## Evaluation Conclusions

| Description | Evaluation |
|---|---|
| Intersection Analysis<br>Existing Conditions | I1: 9th Street & School Access Road: All approaches Level of Service C or better<br>I2: 4th Street & Beth Avenue: All approaches Level of Service A |
| Intersection Analysis<br>2022 Opening Day | I1: 9th Street & School Access Road: All approaches Level of Service C or better<br>I2: 4th Street & Beth Avenue: All approaches Level of Service A<br>A1: 4th Street & Access/Logan: All approaches Level of Service A |
| Intersection Analysis<br>2040 Future Year | I1: 9th Street & School Access Road: All approaches Level of Service C or better<br>I2: 4th Street & Beth Avenue: All approaches Level of Service A<br>A1: 4th Street & Access/Logan: All approaches Level of Service A |
| Proposed Roadway Improvements<br>(Turn lanes, acceleration lanes, etc) | Due to low traffic volumes and high Levels of Service, no new turn lane improvements are expected to be required to support movements to and from the development. There is an existing two-way-left-turn lane on 9th Street that can be re-striped to provide a westbound left-turn lane to the access road to the site |
| Traffic Signal Warrants | None of the study intersections will meet Peak Hour warrants for 2040 Future Year |

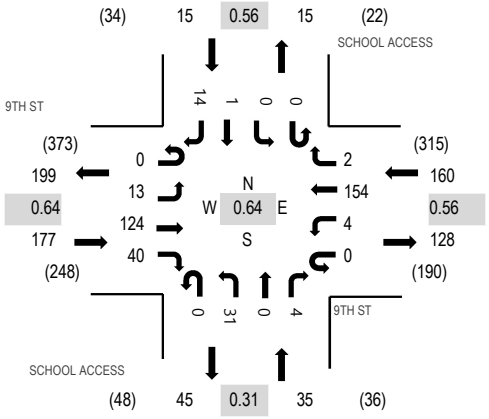
# APPENDIX 1

## Existing Traffic Counts

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

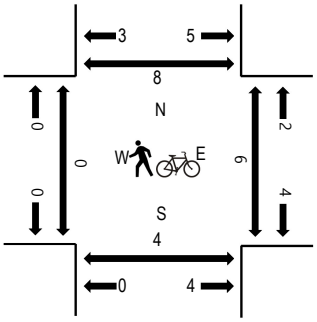
**Location:** 1 SCHOOL ACCESS & 9TH ST AM
**Date:** Tuesday, November 9, 2021
**Peak Hour:** 07:30 AM - 08:30 AM
**Peak 15-Minutes:** 08:15 AM - 08:30 AM

## Peak Hour - All Vehicles




Note: Total study counts contained in parentheses.

## Peak Hour - Pedestrians/Bicycles on Crosswalk




## Traffic Counts

| Interval Start Time | 9TH ST Eastbound | | | | 9TH ST Westbound | | | | SCHOOL ACCESS Northbound | | | | SCHOOL ACCESS Southbound | | | | | Rolling Hour | Pedestrian Crossings | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | U-Turn | Left | Thru | Right | U-Turn | Left | Thru | Right | U-Turn | Left | Thru | Right | U-Turn | Left | Thru | Right | Total | | West | East | South | North |
| 7:00 AM | 0 | 2 | 15 | 1 | 0 | 0 | 56 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 6 | 81 | 299 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 4 | 25 | 2 | 0 | 0 | 55 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 11 | 98 | 334 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 3 | 25 | 8 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 59 | 387 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 2 | 21 | 4 | 0 | 0 | 27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 61 | 366 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 3 | 55 | 11 | 0 | 4 | 34 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 1 | 1 | 116 | 334 | 0 | 0 | 2 | 1 |
| 8:15 AM | 0 | 5 | 23 | 17 | 0 | 0 | 72 | 2 | 0 | 24 | 0 | 4 | 0 | 0 | 0 | 4 | 151 | | 0 | 6 | 0 | 6 |
| 8:30 AM | 0 | 1 | 10 | 0 | 0 | 0 | 26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 38 | | 0 | 0 | 0 | 1 |
| 8:45 AM | 0 | 0 | 11 | 0 | 0 | 0 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 29 | | 0 | 0 | 0 | 0 |
| Count Total | 0 | 20 | 185 | 43 | 0 | 4 | 309 | 2 | 0 | 32 | 0 | 4 | 0 | 1 | 1 | 32 | 633 | | 0 | 6 | 2 | 8 |
| Peak Hour | 0 | 13 | 124 | 40 | 0 | 4 | 154 | 2 | 0 | 31 | 0 | 4 | 0 | 0 | 1 | 14 | 387 | | 0 | 6 | 2 | 7 |

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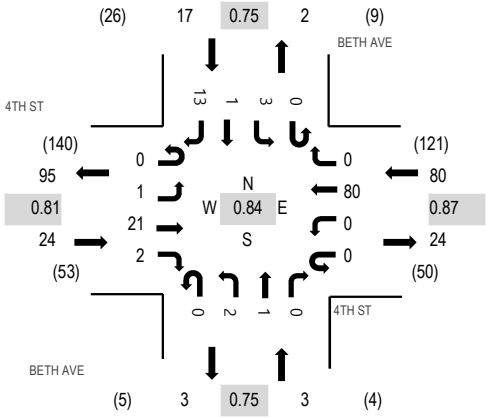
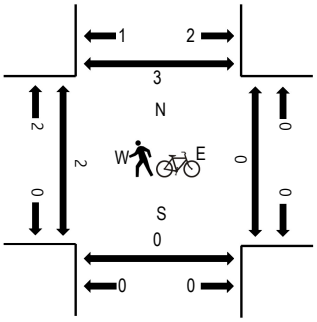
**Location:** 2 BETH AVE & 4TH ST AM
**Date:** Tuesday, November 9, 2021
**Peak Hour:** 07:00 AM - 08:00 AM
**Peak 15-Minutes:** 07:15 AM - 07:30 AM

## Peak Hour - All Vehicles




Note: Total study counts contained in parentheses.

## Peak Hour - Pedestrians/Bicycles on Crosswalk




## Traffic Counts

| Interval Start Time | 4TH ST Eastbound | | | | 4TH ST Westbound | | | | BETH AVE Northbound | | | | BETH AVE Southbound | | | | Total | Rolling Hour | Pedestrian Crossings | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | U-Turn | Left | Thru | Right | U-Turn | Left | Thru | Right | U-Turn | Left | Thru | Right | U-Turn | Left | Thru | Right | | | West | East | South | North |
| 7:00 AM | 0 | 1 | 6 | 2 | 0 | 0 | 22 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 4 | 36 | 124 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 7 | 0 | 0 | 0 | 23 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 5 | 37 | 117 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 2 | 0 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 20 | 95 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 6 | 0 | 0 | 0 | 19 | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 3 | 31 | 93 | 2 | 0 | 0 | 3 |
| 8:00 AM | 0 | 1 | 6 | 0 | 0 | 0 | 14 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 29 | 80 | 0 | 0 | 0 | 3 |
| 8:15 AM | 0 | 0 | 6 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 1 | 7 | 1 | 0 | 0 | 6 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 18 | | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 1 | 5 | 1 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 18 | | 0 | 0 | 0 | 0 |
| Count Total | 0 | 4 | 45 | 4 | 0 | 0 | 118 | 3 | 0 | 2 | 2 | 0 | 0 | 5 | 1 | 20 | 204 | | 2 | 0 | 0 | 6 |
| Peak Hour | 0 | 1 | 21 | 2 | 0 | 0 | 80 | 0 | 0 | 2 | 1 | 0 | 0 | 3 | 1 | 13 | 124 | | 2 | 0 | 0 | 3 |

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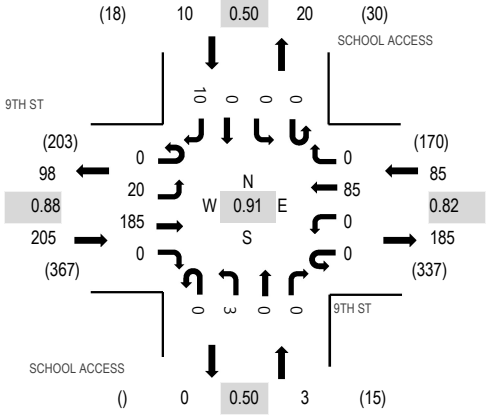
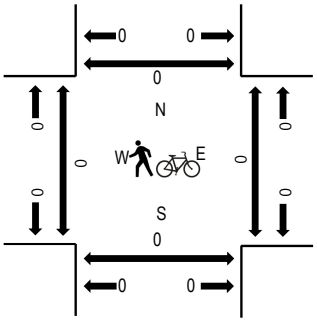
**Location:** 1 SCHOOL ACCESS & 9TH ST PM
**Date:** Tuesday, November 9, 2021
**Peak Hour:** 05:00 PM - 06:00 PM
**Peak 15-Minutes:** 05:15 PM - 05:30 PM

## Peak Hour - All Vehicles




Note: Total study counts contained in parentheses.

## Peak Hour - Pedestrians/Bicycles on Crosswalk




## Traffic Counts

| Interval Start Time | 9TH ST Eastbound | | | | 9TH ST Westbound | | | | SCHOOL ACCESS Northbound | | | | SCHOOL ACCESS Southbound | | | | | Rolling Hour | Pedestrian Crossings | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | U-Turn | Left | Thru | Right | U-Turn | Left | Thru | Right | U-Turn | Left | Thru | Right | U-Turn | Left | Thru | Right | Total | | West | East | South | North |
| 4:00 PM | 0 | 2 | 44 | 0 | 0 | 0 | 26 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 3 | 81 | 267 | 0 | 0 | 1 | 0 |
| 4:15 PM | 0 | 3 | 31 | 0 | 0 | 0 | 21 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 59 | 262 | 0 | 1 | 1 | 0 |
| 4:30 PM | 0 | 1 | 30 | 0 | 0 | 0 | 16 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | 286 | 0 | 0 | 0 | 2 |
| 4:45 PM | 0 | 4 | 47 | 0 | 0 | 0 | 22 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 3 | 77 | 302 | 0 | 0 | 0 | 1 |
| 5:00 PM | 0 | 5 | 45 | 0 | 0 | 0 | 22 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 76 | 303 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 3 | 55 | 0 | 0 | 0 | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 83 | | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 6 | 40 | 0 | 0 | 0 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 66 | | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 6 | 45 | 0 | 0 | 0 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 78 | | 0 | 0 | 0 | 0 |
| Count Total | 0 | 30 | 337 | 0 | 0 | 0 | 170 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 18 | 570 | | 0 | 1 | 2 | 3 |
| Peak Hour | 0 | 20 | 185 | 0 | 0 | 0 | 85 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 10 | 303 | | 0 | 0 | 0 | 0 |

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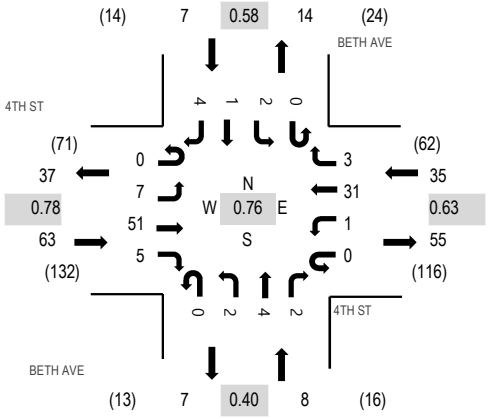
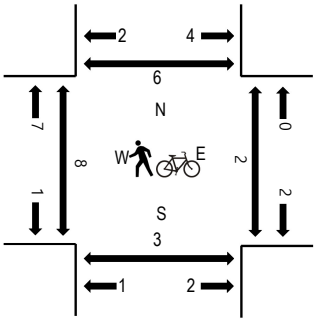
**Location:** 2 BETH AVE & 4TH ST PM
**Date:** Tuesday, November 9, 2021
**Peak Hour:** 04:00 PM - 05:00 PM
**Peak 15-Minutes:** 04:00 PM - 04:15 PM

## Peak Hour - All Vehicles




Note: Total study counts contained in parentheses.

## Peak Hour - Pedestrians/Bicycles on Crosswalk




## Traffic Counts

| Interval Start Time | 4TH ST Eastbound | | | | 4TH ST Westbound | | | | BETH AVE Northbound | | | | BETH AVE Southbound | | | | Total | Rolling Hour | Pedestrian Crossings | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | U-Turn | Left | Thru | Right | U-Turn | Left | Thru | Right | U-Turn | Left | Thru | Right | U-Turn | Left | Thru | Right | | | West | East | South | North |
| 4:00 PM | 0 | 3 | 11 | 1 | 0 | 1 | 12 | 1 | 0 | 2 | 1 | 2 | 0 | 1 | 0 | 2 | 37 | 113 | 2 | 2 | 0 | 1 |
| 4:15 PM | 0 | 1 | 15 | 3 | 0 | 0 | 9 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 30 | 99 | 5 | 0 | 2 | 4 |
| 4:30 PM | 0 | 1 | 12 | 1 | 0 | 0 | 5 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 22 | 98 | 1 | 0 | 1 | 1 |
| 4:45 PM | 0 | 2 | 13 | 0 | 0 | 0 | 5 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 24 | 101 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 12 | 0 | 0 | 0 | 7 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 23 | 111 | 0 | 0 | 3 | 0 |
| 5:15 PM | 0 | 3 | 18 | 1 | 0 | 0 | 4 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 29 | | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 3 | 14 | 1 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 25 | | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 1 | 14 | 2 | 0 | 0 | 10 | 1 | 0 | 3 | 0 | 0 | 0 | 1 | 0 | 2 | 34 | | 0 | 0 | 0 | 0 |
| Count Total | 0 | 14 | 109 | 9 | 0 | 1 | 56 | 5 | 1 | 6 | 5 | 4 | 0 | 3 | 2 | 9 | 224 | | 8 | 2 | 6 | 6 |
| Peak Hour | 0 | 7 | 51 | 5 | 0 | 1 | 31 | 3 | 0 | 2 | 4 | 2 | 0 | 2 | 1 | 4 | 113 | | 8 | 2 | 3 | 6 |

# APPENDIX 2

## Trip Generation Report

## Trip Generation Summary

Alternative: Alternative 1
Phase:
Project: Coyote Creek PA-4

Open Date: 11/8/2021
Analysis Date: 11/8/2021

| ITE | Land Use | | Weekday Average Daily Trips | | | Weekday AM Peak Hour of Adjacent Street Traffic | | | Weekday PM Peak Hour of Adjacent Street Traffic | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | * | Enter | Exit | Total | Enter | Exit | Total | Enter | Exit | Total |
| 210 | SFHOUSE 1 | | 279 | 278 | 557 | 11 | 33 | 44 | 37 | 21 | 58 |
| | 59 Dwelling Units | | | | | | | | | | |
| Unadjusted Volume | | | 279 | 278 | 557 | 11 | 33 | 44 | 37 | 21 | 58 |
| Internal Capture Trips | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-By Trips | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Volume Added to Adjacent Streets | | | 279 | 278 | 557 | 11 | 33 | 44 | 37 | 21 | 58 |

Total Weekday Average Daily Trips Internal Capture = 0 Percent
Total Weekday AM Peak Hour of Adjacent Street Traffic Internal Capture = 0 Percent
Total Weekday PM Peak Hour of Adjacent Street Traffic Internal Capture = 0 Percent

* - Custom rate used for selected time period.

Source: Institute of Transportation Engineers, Trip Generation Manual 10th Edition
**TRIP GENERATION 10, TRAFFICWARE, LLC**

**Detailed Land Use Data**

For 59 Dwelling Units of SFHOUSE 1

( 210 ) Single-Family Detached Housing

Project: Coyote Creek PA-4

Open Date: 11/8/2021

Analysis Date: 11/8/2021

| Day / Period | Total Trips | Pass-By Trips | Avg Rate | Min Rate | Max Rate | Std Dev | Avg Size | % Enter | % Exit | Use Eq. | Equation | R2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Weekday Average Daily Trips | 557 | 0 | 9.44 | 4.81 | 19.39 | 2.1 | 264 | 50 | 50 | False | Ln(T) = 0.92 Ln(X) + 2.71 | 0.95 |
| Source : Trip Generation Manual 10th Edition | | | | | | | | | | | | |
| Weekday AM Peak Hour of Adjacent Street Traffic | 44 | 0 | 0.74 | 0.33 | 2.27 | 0.27 | 219 | 25 | 75 | False | T = 0.71(X) + 4.8 | 0.89 |
| Source : Trip Generation Manual 10th Edition | | | | | | | | | | | | |
| Weekday PM Peak Hour of Adjacent Street Traffic | 58 | 0 | 0.99 | 0.44 | 2.98 | 0.31 | 242 | 63 | 37 | False | Ln(T) = 0.96 Ln(X) + 0.2 | 0.92 |
| Source : Trip Generation Manual 10th Edition | | | | | | | | | | | | |

# APPENDIX 3

## Synchro Reports

| Intersection | |
|---|---|
| Int Delay, s/veh | 3.4 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ⇕ | | | ⇕ | | | ⇕ | | | ⇕ | |
| Traffic Vol, veh/h | 13 | 124 | 40 | 4 | 154 | 2 | 31 | 1 | 4 | 1 | 1 | 14 |
| Future Vol, veh/h | 13 | 124 | 40 | 4 | 154 | 2 | 31 | 1 | 4 | 1 | 1 | 14 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 64 | 64 | 64 | 56 | 56 | 56 | 31 | 31 | 31 | 56 | 56 | 56 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 20 | 194 | 63 | 7 | 275 | 4 | 100 | 3 | 13 | 2 | 2 | 25 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 279 | 0 | 0 | 257 | 0 | 0 | 571 | 559 | 226 | 565 | 588 | 277 |
| Stage 1 | - | - | - | - | - | - | 266 | 266 | - | 291 | 291 | - |
| Stage 2 | - | - | - | - | - | - | 305 | 293 | - | 274 | 297 | - |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.318 |
| Pot Cap-1 Maneuver | 1284 | - | - | 1308 | - | - | 432 | 438 | 813 | 436 | 421 | 762 |
| Stage 1 | - | - | - | - | - | - | 739 | 689 | - | 717 | 672 | - |
| Stage 2 | - | - | - | - | - | - | 705 | 670 | - | 732 | 668 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1284 | - | - | 1308 | - | - | 409 | 427 | 813 | 419 | 411 | 762 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 409 | 427 | - | 419 | 411 | - |
| Stage 1 | - | - | - | - | - | - | 726 | 677 | - | 704 | 668 | - |
| Stage 2 | - | - | - | - | - | - | 676 | 666 | - | 704 | 656 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0.6 | 0.2 | 16.3 | 10.4 |
| HCM LOS | | | C | B |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 433 | 1284 | - | - | 1308 | - | - | 690 |
| HCM Lane V/C Ratio | 0.268 | 0.016 | - | - | 0.005 | - | - | 0.041 |
| HCM Control Delay (s) | 16.3 | 7.8 | 0 | - | 7.8 | 0 | - | 10.4 |
| HCM Lane LOS | C | A | A | - | A | A | - | B |
| HCM 95th %tile Q(veh) | 1.1 | 0 | - | - | 0 | - | - | 0.1 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.2 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Vol, veh/h | 20 | 185 | 1 | 1 | 85 | 1 | 1 | 1 | 1 | 1 | 1 | 10 |
| Future Vol, veh/h | 20 | 185 | 1 | 1 | 85 | 1 | 1 | 1 | 1 | 1 | 1 | 10 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 88 | 88 | 88 | 82 | 82 | 82 | 50 | 50 | 50 | 50 | 50 | 50 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 23 | 210 | 1 | 1 | 104 | 1 | 2 | 2 | 2 | 2 | 2 | 20 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 105 | 0 | 0 | 211 | 0 | 0 | 375 | 364 | 211 | 366 | 364 | 105 |
| Stage 1 | - | - | - | - | - | - | 257 | 257 | - | 107 | 107 | - |
| Stage 2 | - | - | - | - | - | - | 118 | 107 | - | 259 | 257 | - |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.318 |
| Pot Cap-1 Maneuver | 1486 | - | - | 1360 | - | - | 582 | 564 | 829 | 590 | 564 | 949 |
| Stage 1 | - | - | - | - | - | - | 748 | 695 | - | 898 | 807 | - |
| Stage 2 | - | - | - | - | - | - | 887 | 807 | - | 746 | 695 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1486 | - | - | 1360 | - | - | 560 | 553 | 829 | 578 | 553 | 949 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 560 | 553 | - | 578 | 553 | - |
| Stage 1 | - | - | - | - | - | - | 735 | 682 | - | 882 | 806 | - |
| Stage 2 | - | - | - | - | - | - | 865 | 806 | - | 729 | 682 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0.7 | 0.1 | 10.8 | 9.3 |
| HCM LOS | | | B | A |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 625 | 1486 | - | - | 1360 | - | - | 853 |
| HCM Lane V/C Ratio | 0.01 | 0.015 | - | - | 0.001 | - | - | 0.028 |
| HCM Control Delay (s) | 10.8 | 7.5 | 0 | - | 7.6 | 0 | - | 9.3 |
| HCM Lane LOS | B | A | A | - | A | A | - | A |
| HCM 95th %tile Q(veh) | 0 | 0 | - | - | 0 | - | - | 0.1 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 7.3 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 1 | 21 | 2 | 1 | 80 | 1 | 2 | 1 | 1 | 3 | 1 | 13 |
| Future Vol, veh/h | 1 | 21 | 2 | 1 | 80 | 1 | 2 | 1 | 1 | 3 | 1 | 13 |
| Peak Hour Factor | 0.81 | 0.81 | 0.81 | 0.87 | 0.87 | 0.87 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 1 | 26 | 2 | 1 | 92 | 1 | 3 | 1 | 1 | 4 | 1 | 17 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay | 7.2 | 7.5 | 7.2 | 6.9 |
| HCM LOS | A | A | A | A |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 50% | 4% | 1% | 18% |
| Vol Thru, % | 25% | 88% | 98% | 6% |
| Vol Right, % | 25% | 8% | 1% | 76% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 4 | 24 | 82 | 17 |
| LT Vol | 2 | 1 | 1 | 3 |
| Through Vol | 1 | 21 | 80 | 1 |
| RT Vol | 1 | 2 | 1 | 13 |
| Lane Flow Rate | 5 | 30 | 94 | 23 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.006 | 0.033 | 0.105 | 0.023 |
| Departure Headway (Hd) | 4.116 | 4.012 | 4 | 3.728 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 863 | 892 | 898 | 952 |
| Service Time | 2.173 | 2.038 | 2.014 | 1.783 |
| HCM Lane V/C Ratio | 0.006 | 0.034 | 0.105 | 0.024 |
| HCM Control Delay | 7.2 | 7.2 | 7.5 | 6.9 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0 | 0.1 | 0.4 | 0.1 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 7.5 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 1 | 21 | 2 | 1 | 80 | 1 | 2 | 1 | 1 | 3 | 1 | 13 |
| Future Vol, veh/h | 1 | 21 | 2 | 1 | 80 | 1 | 2 | 1 | 1 | 3 | 1 | 13 |
| Peak Hour Factor | 0.78 | 0.78 | 0.78 | 0.63 | 0.63 | 0.63 | 0.40 | 0.40 | 0.40 | 0.58 | 0.58 | 0.58 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 1 | 27 | 3 | 2 | 127 | 2 | 5 | 3 | 3 | 5 | 2 | 22 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay | 7.2 | 7.7 | 7.3 | 7 |
| HCM LOS | A | A | A | A |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 50% | 4% | 1% | 18% |
| Vol Thru, % | 25% | 88% | 98% | 6% |
| Vol Right, % | 25% | 8% | 1% | 76% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 4 | 24 | 82 | 17 |
| LT Vol | 2 | 1 | 1 | 3 |
| Through Vol | 1 | 21 | 80 | 1 |
| RT Vol | 1 | 2 | 1 | 13 |
| Lane Flow Rate | 10 | 31 | 130 | 29 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.012 | 0.035 | 0.145 | 0.031 |
| Departure Headway (Hd) | 4.185 | 4.059 | 4.02 | 3.796 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 845 | 878 | 893 | 931 |
| Service Time | 2.262 | 2.1 | 2.043 | 1.869 |
| HCM Lane V/C Ratio | 0.012 | 0.035 | 0.146 | 0.031 |
| HCM Control Delay | 7.3 | 7.2 | 7.7 | 7 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0 | 0.1 | 0.5 | 0.1 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 4.3 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ⇕ | | | ⇕ | | | ⇕ | | | ⇕ | |
| Traffic Vol, veh/h | 16 | 127 | 44 | 8 | 157 | 5 | 31 | 5 | 4 | 5 | 5 | 16 |
| Future Vol, veh/h | 16 | 127 | 44 | 8 | 157 | 5 | 31 | 5 | 4 | 5 | 5 | 16 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 64 | 64 | 64 | 56 | 56 | 56 | 31 | 31 | 31 | 56 | 56 | 56 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 25 | 198 | 69 | 14 | 280 | 9 | 100 | 16 | 13 | 9 | 9 | 29 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 289 | 0 | 0 | 267 | 0 | 0 | 615 | 600 | 233 | 610 | 630 | 285 |
| Stage 1 | - | - | - | - | - | - | 283 | 283 | - | 313 | 313 | - |
| Stage 2 | - | - | - | - | - | - | 332 | 317 | - | 297 | 317 | - |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.318 |
| Pot Cap-1 Maneuver | 1273 | - | - | 1297 | - | - | 403 | 415 | 806 | 407 | 399 | 754 |
| Stage 1 | - | - | - | - | - | - | 724 | 677 | - | 698 | 657 | - |
| Stage 2 | - | - | - | - | - | - | 681 | 654 | - | 712 | 654 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1273 | - | - | 1297 | - | - | 370 | 400 | 806 | 378 | 385 | 754 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 370 | 400 | - | 378 | 385 | - |
| Stage 1 | - | - | - | - | - | - | 707 | 661 | - | 682 | 648 | - |
| Stage 2 | - | - | - | - | - | - | 638 | 645 | - | 668 | 639 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0.7 | 0.4 | 18.5 | 12.2 |
| HCM LOS | | | C | B |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 395 | 1273 | - | - | 1297 | - | - | 548 |
| HCM Lane V/C Ratio | 0.327 | 0.02 | - | - | 0.011 | - | - | 0.085 |
| HCM Control Delay (s) | 18.5 | 7.9 | 0 | - | 7.8 | 0 | - | 12.2 |
| HCM Lane LOS | C | A | A | - | A | A | - | B |
| HCM 95th %tile Q(veh) | 1.4 | 0.1 | - | - | 0 | - | - | 0.3 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 2.2 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ⇕ | | | ⇕ | | | ⇕ | | | ⇕ | |
| Traffic Vol, veh/h | 23 | 188 | 8 | 7 | 88 | 4 | 3 | 5 | 1 | 5 | 5 | 12 |
| Future Vol, veh/h | 23 | 188 | 8 | 7 | 88 | 4 | 3 | 5 | 1 | 5 | 5 | 12 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 88 | 88 | 88 | 82 | 82 | 82 | 50 | 50 | 50 | 50 | 50 | 50 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 26 | 214 | 9 | 9 | 107 | 5 | 6 | 10 | 2 | 10 | 10 | 24 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 112 | 0 | 0 | 223 | 0 | 0 | 416 | 401 | 219 | 405 | 403 | 110 |
| Stage 1 | - | - | - | - | - | - | 271 | 271 | - | 128 | 128 | - |
| Stage 2 | - | - | - | - | - | - | 145 | 130 | - | 277 | 275 | - |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.318 |
| Pot Cap-1 Maneuver | 1478 | - | - | 1346 | - | - | 547 | 538 | 821 | 556 | 536 | 943 |
| Stage 1 | - | - | - | - | - | - | 735 | 685 | - | 876 | 790 | - |
| Stage 2 | - | - | - | - | - | - | 858 | 789 | - | 729 | 683 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1478 | - | - | 1346 | - | - | 515 | 523 | 821 | 535 | 522 | 943 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 515 | 523 | - | 535 | 522 | - |
| Stage 1 | - | - | - | - | - | - | 720 | 671 | - | 858 | 784 | - |
| Stage 2 | - | - | - | - | - | - | 820 | 783 | - | 702 | 669 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0.8 | 0.5 | 11.9 | 10.5 |
| HCM LOS | | | B | B |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 542 | 1478 | - | - | 1346 | - | - | 695 |
| HCM Lane V/C Ratio | 0.033 | 0.018 | - | - | 0.006 | - | - | 0.063 |
| HCM Control Delay (s) | 11.9 | 7.5 | 0 | - | 7.7 | 0 | - | 10.5 |
| HCM Lane LOS | B | A | A | - | A | A | - | B |
| HCM 95th %tile Q(veh) | 0.1 | 0.1 | - | - | 0 | - | - | 0.2 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 7.5 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 5 | 31 | 6 | 5 | 101 | 5 | 2 | 1 | 1 | 5 | 3 | 15 |
| Future Vol, veh/h | 5 | 31 | 6 | 5 | 101 | 5 | 2 | 1 | 1 | 5 | 3 | 15 |
| Peak Hour Factor | 0.81 | 0.81 | 0.81 | 0.87 | 0.87 | 0.87 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 6 | 38 | 7 | 6 | 116 | 6 | 3 | 1 | 1 | 7 | 4 | 20 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay | 7.3 | 7.7 | 7.3 | 7.1 |
| HCM LOS | A | A | A | A |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 50% | 12% | 5% | 22% |
| Vol Thru, % | 25% | 74% | 91% | 13% |
| Vol Right, % | 25% | 14% | 5% | 65% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 4 | 42 | 111 | 23 |
| LT Vol | 2 | 5 | 5 | 5 |
| Through Vol | 1 | 31 | 101 | 3 |
| RT Vol | 1 | 6 | 5 | 15 |
| Lane Flow Rate | 5 | 52 | 128 | 31 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.006 | 0.058 | 0.142 | 0.033 |
| Departure Headway (Hd) | 4.216 | 4.03 | 4.018 | 3.898 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 837 | 886 | 893 | 906 |
| Service Time | 2.301 | 2.069 | 2.042 | 1.977 |
| HCM Lane V/C Ratio | 0.006 | 0.059 | 0.143 | 0.034 |
| HCM Control Delay | 7.3 | 7.3 | 7.7 | 7.1 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0 | 0.2 | 0.5 | 0.1 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 7.5 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 11 | 73 | 9 | 5 | 46 | 7 | 2 | 4 | 2 | 4 | 3 | 6 |
| Future Vol, veh/h | 11 | 73 | 9 | 5 | 46 | 7 | 2 | 4 | 2 | 4 | 3 | 6 |
| Peak Hour Factor | 0.81 | 0.81 | 0.81 | 0.87 | 0.87 | 0.87 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 14 | 90 | 11 | 6 | 53 | 8 | 3 | 5 | 3 | 5 | 4 | 8 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay | 7.6 | 7.4 | 7.3 | 7.2 |
| HCM LOS | A | A | A | A |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 25% | 12% | 9% | 31% |
| Vol Thru, % | 50% | 78% | 79% | 23% |
| Vol Right, % | 25% | 10% | 12% | 46% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 8 | 93 | 58 | 13 |
| LT Vol | 2 | 11 | 5 | 4 |
| Through Vol | 4 | 73 | 46 | 3 |
| RT Vol | 2 | 9 | 7 | 6 |
| Lane Flow Rate | 11 | 115 | 67 | 17 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.012 | 0.127 | 0.074 | 0.019 |
| Departure Headway (Hd) | 4.159 | 3.996 | 4.012 | 4.038 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 849 | 897 | 891 | 875 |
| Service Time | 2.239 | 2.023 | 2.047 | 2.117 |
| HCM Lane V/C Ratio | 0.013 | 0.128 | 0.075 | 0.019 |
| HCM Control Delay | 7.3 | 7.6 | 7.4 | 7.2 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0 | 0.4 | 0.2 | 0.1 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 2 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 6 | 25 | 84 | 3 | 10 | 17 |
| Future Vol, veh/h | 6 | 25 | 84 | 3 | 10 | 17 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 0 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 7 | 27 | 91 | 3 | 11 | 18 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 94 | 0 | - | 0 | 134 | 93 |
| Stage 1 | - | - | - | - | 93 | - |
| Stage 2 | - | - | - | - | 41 | - |
| Critical Hdwy | 4.12 | - | - | - | 6.42 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.42 | - |
| Follow-up Hdwy | 2.218 | - | - | - | 3.518 | 3.318 |
| Pot Cap-1 Maneuver | 1500 | - | - | - | 860 | 964 |
| Stage 1 | - | - | - | - | 931 | - |
| Stage 2 | - | - | - | - | 981 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 1500 | - | - | - | 856 | 964 |
| Mov Cap-2 Maneuver | - | - | - | - | 856 | - |
| Stage 1 | - | - | - | - | 926 | - |
| Stage 2 | - | - | - | - | 981 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s | 1.4 | 0 | 9 |
| HCM LOS | | | A |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1500 | - | - | - | 921 |
| HCM Lane V/C Ratio | 0.004 | - | - | - | 0.032 |
| HCM Control Delay (s) | 7.4 | 0 | - | - | 9 |
| HCM Lane LOS | A | A | - | - | A |
| HCM 95th %tile Q(veh) | 0 | - | - | - | 0.1 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 2.1 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 18 | 55 | 35 | 12 | 6 | 11 |
| Future Vol, veh/h | 18 | 55 | 35 | 12 | 6 | 11 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 0 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 20 | 60 | 38 | 13 | 7 | 12 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 51 | 0 | - | 0 | 145 | 45 |
| Stage 1 | - | - | - | - | 45 | - |
| Stage 2 | - | - | - | - | 100 | - |
| Critical Hdwy | 4.12 | - | - | - | 6.42 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.42 | - |
| Follow-up Hdwy | 2.218 | - | - | - | 3.518 | 3.318 |
| Pot Cap-1 Maneuver | 1555 | - | - | - | 847 | 1025 |
| Stage 1 | - | - | - | - | 977 | - |
| Stage 2 | - | - | - | - | 924 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 1555 | - | - | - | 836 | 1025 |
| Mov Cap-2 Maneuver | - | - | - | - | 836 | - |
| Stage 1 | - | - | - | - | 964 | - |
| Stage 2 | - | - | - | - | 924 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s | 1.8 | 0 | 8.9 |
| HCM LOS | | | A |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1555 | - | - | - | 949 |
| HCM Lane V/C Ratio | 0.013 | - | - | - | 0.019 |
| HCM Control Delay (s) | 7.3 | 0 | - | - | 8.9 |
| HCM Lane LOS | A | A | - | - | A |
| HCM 95th %tile Q(veh) | 0 | - | - | - | 0.1 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 3.8 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ⇕ | | | ⇕ | | | ⇕ | | | ⇕ | |
| Traffic Vol, veh/h | 51 | 181 | 56 | 30 | 212 | 40 | 44 | 15 | 20 | 5 | 5 | 16 |
| Future Vol, veh/h | 51 | 181 | 56 | 30 | 212 | 40 | 44 | 15 | 20 | 5 | 5 | 16 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 64 | 226 | 70 | 38 | 265 | 50 | 55 | 19 | 25 | 6 | 6 | 20 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 315 | 0 | 0 | 296 | 0 | 0 | 768 | 780 | 261 | 777 | 790 | 290 |
| Stage 1 | - | - | - | - | - | - | 389 | 389 | - | 366 | 366 | - |
| Stage 2 | - | - | - | - | - | - | 379 | 391 | - | 411 | 424 | - |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.318 |
| Pot Cap-1 Maneuver | 1245 | - | - | 1265 | - | - | 319 | 327 | 778 | 314 | 322 | 749 |
| Stage 1 | - | - | - | - | - | - | 635 | 608 | - | 653 | 623 | - |
| Stage 2 | - | - | - | - | - | - | 643 | 607 | - | 618 | 587 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1245 | - | - | 1265 | - | - | 283 | 295 | 778 | 268 | 291 | 749 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 283 | 295 | - | 268 | 291 | - |
| Stage 1 | - | - | - | - | - | - | 596 | 570 | - | 613 | 600 | - |
| Stage 2 | - | - | - | - | - | - | 596 | 585 | - | 543 | 551 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 1.4 | 0.8 | 19.9 | 13.5 |
| HCM LOS | | | C | B |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 340 | 1245 | - | - | 1265 | - | - | 455 |
| HCM Lane V/C Ratio | 0.29 | 0.051 | - | - | 0.03 | - | - | 0.071 |
| HCM Control Delay (s) | 19.9 | 8 | 0 | - | 7.9 | 0 | - | 13.5 |
| HCM Lane LOS | C | A | A | - | A | A | - | B |
| HCM 95th %tile Q(veh) | 1.2 | 0.2 | - | - | 0.1 | - | - | 0.2 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 2.8 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Vol, veh/h | 58 | 242 | 34 | 20 | 145 | 39 | 18 | 15 | 15 | 5 | 5 | 12 |
| Future Vol, veh/h | 58 | 242 | 34 | 20 | 145 | 39 | 18 | 15 | 15 | 5 | 5 | 12 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 73 | 303 | 43 | 25 | 181 | 49 | 23 | 19 | 19 | 6 | 6 | 15 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 230 | 0 | 0 | 346 | 0 | 0 | 737 | 751 | 325 | 746 | 748 | 206 |
| Stage 1 | - | - | - | - | - | - | 471 | 471 | - | 256 | 256 | - |
| Stage 2 | - | - | - | - | - | - | 266 | 280 | - | 490 | 492 | - |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.318 |
| Pot Cap-1 Maneuver | 1338 | - | - | 1213 | - | - | 334 | 340 | 716 | 330 | 341 | 835 |
| Stage 1 | - | - | - | - | - | - | 573 | 560 | - | 749 | 696 | - |
| Stage 2 | - | - | - | - | - | - | 739 | 679 | - | 560 | 548 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1338 | - | - | 1213 | - | - | 301 | 309 | 716 | 285 | 310 | 835 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 301 | 309 | - | 285 | 310 | - |
| Stage 1 | - | - | - | - | - | - | 534 | 522 | - | 698 | 679 | - |
| Stage 2 | - | - | - | - | - | - | 702 | 663 | - | 490 | 511 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 1.4 | 0.8 | 16.6 | 13.4 |
| HCM LOS | | | C | B |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 371 | 1338 | - | - | 1213 | - | - | 458 |
| HCM Lane V/C Ratio | 0.162 | 0.054 | - | - | 0.021 | - | - | 0.06 |
| HCM Control Delay (s) | 16.6 | 7.8 | 0 | - | 8 | 0 | - | 13.4 |
| HCM Lane LOS | C | A | A | - | A | A | - | B |
| HCM 95th %tile Q(veh) | 0.6 | 0.2 | - | - | 0.1 | - | - | 0.2 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.1 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 6 | 96 | 153 | 3 | 10 | 17 |
| Future Vol, veh/h | 6 | 96 | 153 | 3 | 10 | 17 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 0 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 7 | 104 | 166 | 3 | 11 | 18 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 169 | 0 | - | 0 | 286 | 168 |
| Stage 1 | - | - | - | - | 168 | - |
| Stage 2 | - | - | - | - | 118 | - |
| Critical Hdwy | 4.12 | - | - | - | 6.42 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.42 | - |
| Follow-up Hdwy | 2.218 | - | - | - | 3.518 | 3.318 |
| Pot Cap-1 Maneuver | 1409 | - | - | - | 704 | 876 |
| Stage 1 | - | - | - | - | 862 | - |
| Stage 2 | - | - | - | - | 907 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 1409 | - | - | - | 700 | 876 |
| Mov Cap-2 Maneuver | - | - | - | - | 700 | - |
| Stage 1 | - | - | - | - | 858 | - |
| Stage 2 | - | - | - | - | 907 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s | 0.4 | 0 | 9.7 |
| HCM LOS | | | A |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1409 | - | - | - | 801 |
| HCM Lane V/C Ratio | 0.005 | - | - | - | 0.037 |
| HCM Control Delay (s) | 7.6 | 0 | - | - | 9.7 |
| HCM Lane LOS | A | A | - | - | A |
| HCM 95th %tile Q(veh) | 0 | - | - | - | 0.1 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 1 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 18 | 138 | 113 | 12 | 6 | 11 |
| Future Vol, veh/h | 18 | 138 | 113 | 12 | 6 | 11 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 0 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 20 | 150 | 123 | 13 | 7 | 12 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 136 | 0 | - | 0 | 320 | 130 |
| Stage 1 | - | - | - | - | 130 | - |
| Stage 2 | - | - | - | - | 190 | - |
| Critical Hdwy | 4.12 | - | - | - | 6.42 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.42 | - |
| Follow-up Hdwy | 2.218 | - | - | - | 3.518 | 3.318 |
| Pot Cap-1 Maneuver | 1448 | - | - | - | 673 | 920 |
| Stage 1 | - | - | - | - | 896 | - |
| Stage 2 | - | - | - | - | 842 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 1448 | - | - | - | 663 | 920 |
| Mov Cap-2 Maneuver | - | - | - | - | 663 | - |
| Stage 1 | - | - | - | - | 883 | - |
| Stage 2 | - | - | - | - | 842 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s | 0.9 | 0 | 9.6 |
| HCM LOS | | | A |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1448 | - | - | - | 809 |
| HCM Lane V/C Ratio | 0.014 | - | - | - | 0.023 |
| HCM Control Delay (s) | 7.5 | 0 | - | - | 9.6 |
| HCM Lane LOS | A | A | - | - | A |
| HCM 95th %tile Q(veh) | 0 | - | - | - | 0.1 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 8.2 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 5 | 96 | 8 | 5 | 167 | 5 | 7 | 4 | 4 | 3 | 4 | 13 |
| Future Vol, veh/h | 5 | 96 | 8 | 5 | 167 | 5 | 7 | 4 | 4 | 3 | 4 | 13 |
| Peak Hour Factor | 0.81 | 0.81 | 0.81 | 0.87 | 0.87 | 0.87 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 6 | 119 | 10 | 6 | 192 | 6 | 9 | 5 | 5 | 4 | 5 | 17 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay | 8 | 8.4 | 7.8 | 7.5 |
| HCM LOS | A | A | A | A |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 47% | 5% | 3% | 15% |
| Vol Thru, % | 27% | 88% | 94% | 20% |
| Vol Right, % | 27% | 7% | 3% | 65% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 15 | 109 | 177 | 20 |
| LT Vol | 7 | 5 | 5 | 3 |
| Through Vol | 4 | 96 | 167 | 4 |
| RT Vol | 4 | 8 | 5 | 13 |
| Lane Flow Rate | 20 | 135 | 203 | 27 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.026 | 0.155 | 0.232 | 0.032 |
| Departure Headway (Hd) | 4.633 | 4.135 | 4.107 | 4.331 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 777 | 857 | 867 | 831 |
| Service Time | 2.634 | 2.211 | 2.169 | 2.332 |
| HCM Lane V/C Ratio | 0.026 | 0.158 | 0.234 | 0.032 |
| HCM Control Delay | 7.8 | 8 | 8.4 | 7.5 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0.1 | 0.5 | 0.9 | 0.1 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 8.2 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 10 | 138 | 12 | 6 | 112 | 11 | 7 | 9 | 9 | 3 | 4 | 13 |
| Future Vol, veh/h | 10 | 138 | 12 | 6 | 112 | 11 | 7 | 9 | 9 | 3 | 4 | 13 |
| Peak Hour Factor | 0.81 | 0.81 | 0.81 | 0.87 | 0.87 | 0.87 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 12 | 170 | 15 | 7 | 129 | 13 | 9 | 12 | 12 | 4 | 5 | 17 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay | 8.4 | 8.1 | 7.8 | 7.5 |
| HCM LOS | A | A | A | A |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 28% | 6% | 5% | 15% |
| Vol Thru, % | 36% | 86% | 87% | 20% |
| Vol Right, % | 36% | 7% | 9% | 65% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 25 | 160 | 129 | 20 |
| LT Vol | 7 | 10 | 6 | 3 |
| Through Vol | 9 | 138 | 112 | 4 |
| RT Vol | 9 | 12 | 11 | 13 |
| Lane Flow Rate | 33 | 198 | 148 | 27 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.042 | 0.226 | 0.171 | 0.032 |
| Departure Headway (Hd) | 4.557 | 4.12 | 4.148 | 4.366 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 790 | 861 | 853 | 825 |
| Service Time | 2.558 | 2.194 | 2.232 | 2.367 |
| HCM Lane V/C Ratio | 0.042 | 0.23 | 0.174 | 0.033 |
| HCM Control Delay | 7.8 | 8.4 | 8.1 | 7.5 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0.1 | 0.9 | 0.6 | 0.1 |

# PRELIMINARY GEOTECHNICAL ENGINEERING REPORT

## PROPOSED MULTI-FAMILY RESIDENTIAL DEVELOPMENT
## PARCEL A – COYOTE CREEK SUBDIVISION
## 4TH STREET AND WAGONWHEEL DRIVE
## FORT LUPTON, COLORADO

**TERRACON PROJECT NO. 25025241**
**October 31, 2002**

*Prepared for:*

**Matrix Funding Corporation**
**c/o Cimarron Consultants, Inc.**
**6551 South Revere Parkway, Suite 265**
**Englewood, Colorado 80111**

**Attn: Mr. Karl Kasch**

*Prepared by:*

**Terracon**
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**Phone: 303-423-3300**
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Terracon

October 31, 2002

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Matrix Funding Corporation
c/o Cimarron Consultants, Inc.
6551 South Revere Parkway, Suite 265
Englewood, Colorado 80111

Attn: Mr. Karl Kasch

**Re: Preliminary Geotechnical Engineering Report**
**Proposed Multi-Family Residential Development**
**Parcel A – Coyote Creek Subdivision**
**4th Street and Wagonwheel Drive**
**Fort Lupton, Colorado**
**Terracon Project No. 25025241**

Terracon has completed preliminary geotechnical engineering exploration for the proposed multi-family residential development to be located near the northwest corner of 4th Street and Wagonwheel Drive in Fort Lupton, Colorado. This study was performed in general accordance with our Proposal Number 2502420 dated July 17, 2002.

The results of our engineering study, including the Boring Location Map, laboratory test results, Logs of Borings, and the preliminary geotechnical recommendations needed to aid in the design and construction of foundations and other earth connected phases of this project are attached.

The subsurface soils at the site consisted of native materials comprised of sands with varying amounts of silt, clay and gravel, clays with varying amounts of sand, and silt with varying amounts of sand extending to depths of about 3 to 14-1/2 feet below existing site grade. Claystone and/or sandstone bedrock was encountered beneath the native soils and extended to the full depth of exploration. The information obtained by geologic survey and the results of field exploration and laboratory testing completed for this study indicate that the sand and silt soils, and sandstone bedrock are generally considered to be non- to low expansive. The clay soils have a low to moderate expansive potential. The claystone bedrock should be considered to be moderately to very highly expansive. The soils and bedrock at anticipated foundation bearing depth have a low to high load bearing capability.

Based on the geotechnical engineering analyses, subsurface exploration and laboratory test results, we recommend that the proposed buildings be supported on a grade beam and drilled pier or spread footing foundation systems. Drilled pier foundation systems will generally be required in areas where potentially expansive claystone bedrock is encountered at relatively shallow depths. If basement construction is not incorporated into the design of the structures, consideration could be given to supporting the proposed

buildings on post-tensioned slab foundation systems. However, if potentially highly to very highly expansive claystone bedrock is encountered at or near slab bearing elevation, consideration should be given to partial removal of these materials, moisture conditioning and recompaction and/or replacement with non- to low expansive on-site or imported soils.

Slab-on-grade associated with the spread footing and drilled pier foundation options is considered acceptable when bearing on non- to low expansive soils provided that care is taken in the placement and compaction of the subgrade materials and that some movement can be tolerated. However, given the engineering characteristics of near surface expansive clays or claystone bedrock which may be encountered at or near floor slab bearing elevations, consideration should be given to partial removal of these materials, and replacement with non- to low expansive on-site or imported soils. If little or no movement can be tolerated, consideration should be given to the use of structural floor systems

Shallow groundwater conditions within some portions of the site will require particular attention in the design and construction.

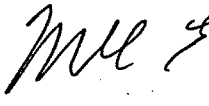
Other design and construction recommendations, based upon geotechnical conditions, are presented in the report.

Supplementary geotechnical engineering exploration should be performed at the site when final design plans become available and preliminary design studies are complete. Supplemental geotechnical explorations will be used to confirm or modify the recommendations contained in this preliminary report.

We appreciate being of service to you in the geotechnical engineering phase of this project, and are prepared to assist you during the construction phases as well. If you have any questions concerning this report or any of our testing, inspection, design and consulting services, please do not hesitate to contact us.

Sincerely,
TERRACON

Mohammed H. Abusalih, E.I.T.
Staff Engineer



Michael E. Anderson, P.E.
Geotechnical Department Manager

Copies to: Addressee (5)

## TABLE OF CONTENTS

Page No.

Letter of Transmittal ..... ii

**INTRODUCTION** ..... 1
**PROPOSED CONSTRUCTION** ..... 1
**SITE EXPLORATION** ..... 2
Field Exploration ..... 2
Laboratory Testing ..... 3
**SITE CONDITIONS** ..... 3
**SUBSURFACE CONDITIONS** ..... 4
Geology ..... 4
Soil and Bedrock Conditions ..... 4
Field and Laboratory Test Results ..... 4
Groundwater Conditions ..... 5
**ENGINEERING ANALYSES AND PRELIMINARY RECOMMENDATIONS** ..... 6
Geotechnical Considerations ..... 6
Foundation Systems ..... 7
Drilled Straight Shaft Piers ..... 7
Spread Footings ..... 8
Post-Tensioned Slabs ..... 9
Basement Construction ..... 10
Lateral Earth Pressures ..... 11
Seismic Considerations ..... 12
Floor Slab Design and Construction ..... 12
Non- to Low Expansive Materials ..... 12
Moderately to Very Highly Expansive Materials ..... 13
Preliminary Pavement Design and Construction ..... 13
Borrow Fill Materials ..... 15
Earthwork ..... 16
General Considerations ..... 16
Site Preparation ..... 16
Subgrade Preparation ..... 17
Fill Materials and Placement ..... 17
Shrinkage ..... 18
Slopes ..... 18
Excavation and Trench Construction ..... 19

## TABLE OF CONTENTS (Cont'd)

Page No.

Additional Design and Construction Considerations ..... 19
Exterior Slab Design and Construction ..... 19
Underground Utility Systems ..... 20
Corrosion Protection ..... 20
Surface Drainage ..... 21
GENERAL COMMENTS ..... 21

Figure No.

BORING LOCATION MAP ..... 1

APPENDIX A: LOGS OF BORINGS

APPENDIX B: LABORATORY TEST RESULTS

APPENDIX C: GENERAL NOTES

# PRELIMINARY GEOTECHNICAL ENGINEERING REPORT

## PROPOSED MULTI-FAMILY RESIDENTIAL DEVELOPMENT
## PARCEL A – COYOTE CREEK SUBDIVISION
## 4TH STREET AND WAGONWHEEL DRIVE
## FORT LUPTON, COLORADO

**TERRACON PROJECT NO. 25025241**
**October 31, 2002**

## INTRODUCTION

This report contains the results of our preliminary geotechnical engineering exploration for the proposed multi-family residential development to be located near the northwest corner of 4th Street and Wagonwheel Drive in Fort Lupton, Colorado.

The purpose of these services is to provide information and preliminary geotechnical engineering recommendations relative to:

- subsurface soil and bedrock conditions;
- groundwater conditions;
- foundation design and construction;
- basement construction;
- lateral earth pressures;
- floor slab design and construction;
- pavement design and construction;
- earthwork; and
- drainage.

The preliminary recommendations contained in this report are based upon the results of field and laboratory testing, engineering analyses, and experience with similar soil conditions, structures and our understanding of the proposed project.

## PROPOSED CONSTRUCTION

As we understand, the project will consist of the development of an approximate 15-acre parcel. Development will be for multi-family residential purposes. A total of 160 residential units are planned. We assume that the residences will consist of one to three-story wood frame structures supported on reinforced concrete foundation systems. We also understand that basement construction may be incorporated into the design of the buildings.

Other major site development, will include the construction of asphalt concrete or Portland cement concrete paved drives and parking areas, along with the installation of underground utilities.

Preliminary grading plans were available prior to the preparation of this report. Maximum fill and cut depths are anticipated to be on the order of about 1 to 4 feet. Generally, cut operations are anticipated within the north and northeastern portions of the site. It is our understanding that the materials derived from cut areas may be transported and used as roadway subgrade materials along Mountain View Avenue, if they meet the requirements outlined in the previous geotechnical engineering report for pavement thickness design for Filing No. 5 of Coyote Creek Subdivision, Terracon Project No. 25025217 dated September 25, 2002.

## SITE EXPLORATION

The scope of the services performed for this project included site reconnaissance by a field engineer, a subsurface exploration program, laboratory testing and engineering analysis.

**Field Exploration:** A total of 10 test borings were drilled on October 10, 2002 to depths of about 20 to 25 feet below existing site grade at the approximate locations shown on the Boring Location Map, Figure 1. Six borings were located throughout the site, with the remaining four borings drilled within the northeast portion of the site where cut operations are planned. All borings were advanced with a truck-mounted drilling rig, utilizing 4-inch diameter solid stem auger.

The borings were located in the field by pacing from property lines and/or existing site features. Elevations were taken at each boring location by interpolation from contours indicated on the provided Site Plan prepared by Merrick Engineering and Architects. The accuracy of boring locations and elevations should only be assumed to the level implied by the methods used.

Lithologic logs of each boring were recorded by the field engineer during the drilling operations. At selected intervals, samples of the subsurface materials were taken by driving ring barrel samplers. Representative bulk samples of subsurface materials were obtained from the borings located within the planned cut areas of the site.

Penetration resistance measurements were obtained by driving the ring barrel into the subsurface materials with a 140-pound hammer falling 30 inches. The penetration resistance value is a useful index to the consistency, relative density or hardness of the materials encountered.

Groundwater measurements were made in each boring at the time of site exploration and several days after drilling.

**Laboratory Testing:** All samples retrieved during the field exploration were returned to the laboratory for observation by the project geotechnical engineer, and were classified in accordance with the Unified Soil Classification System described in Appendix C. Samples of bedrock were classified in accordance with the general notes for Rock Classification. At that time, an applicable laboratory testing program was formulated to determine engineering properties of the subsurface materials. Following the completion of laboratory testing, the field descriptions were confirmed or modified as necessary and Logs of Borings were prepared and are presented in Appendix A.

Laboratory test results are presented in Appendix B, and were used for the geotechnical engineering analyses, and the development of preliminary foundation and earthwork recommendations. All laboratory tests were performed in general accordance with the applicable ASTM, local or other accepted standards.

Selected soil and bedrock samples were tested for the following engineering properties:

- Water content
- Dry density
- Consolidation
- Expansion
- Grain size
- Plasticity Index
- Water soluble sulfate content

## SITE CONDITIONS

The site was vacant at the time of field exploration and to our knowledge had not been previously developed. The site was bounded on the north by Twombly Elementary School, on the east and south by Coyote Creek Golf Course, and on the west by an existing irrigation ditch. The ground surface was generally flat with an estimated elevation differential of about 17 to 20 feet across the entire parcel. Vegetation consisted of a sparse growth of native grass and brush cover. Site drainage was generally in the form of sheet surface flow directed to the west and southwest. An unlined irrigation ditch, about 25 feet wide and about 4 to 6 feet deep, was observed along the western property line of the site. Evidence of potential underground utilities was observed within the northern and central portions of the site.

## SUBSURFACE CONDITIONS

**Geology:** Surficial geologic conditions at the site, as mapped by the U.S. Geological Survey (USGS) ([1]Soister, 1965), consist of alluvial sand and silt deposits of Pleistocene Age. These materials are described as grayish-yellow to grayish-orange sand and silt with some clay, scattered pebbles and gravel lenses. These materials are on the order of about 25 to 30 feet in thickness.

Bedrock underlying the surface units consists of the Dawson Formation of Cretaceous Age. This formation is mostly comprised of dark gray shale and clay with some yellowish-gray siltstone and partly limonitic arkosic sandstone; ironstone concentrations as much as 4 feet in diameter, especially in the lower part; and rare lenticular coal beds less than 3 feet thick. Thickness has been reported to be on the order of about 550 to 600 feet.

Due to the gently sloping nature of the site, geologic hazards at the site are anticipated to be low. Seismic activity in the area is anticipated to be low; and from a structural standpoint, the property should be relatively stable. With proper site grading around the proposed structures, erosional problems at the site should be reduced.

Mapping completed by the Colorado Geological Survey ([2]Hart, 1972), indicates the site is in an area of "Windblown sand or silt " with areas of "Low Swell Potential" adjacent to the site. This material has been described as having low swell potential and may be subject to severe settlement or collapse when water is allowed to saturate the deposits. Bedrock with higher swell potential may be locally less than 10 feet below the ground surface.

**Soil and Bedrock Conditions:** As presented on the Logs of Boring, surface soils to depths of 3 to 14-1/2 feet below existing site grade consisted of native materials comprised of sands with varying amounts of silt, clay and gravel, clays with varying amounts of sand and silts with varying amounts of sand. Claystone and/or sandstone was encountered beneath the native soils and extended to the full depth of exploration.

**Field and Laboratory Test Results:** Field test results indicate that the clay soils vary from stiff to very stiff in consistency. The sand and silt soils vary from loose to medium dense in relative density. The claystone and sandstone bedrock varied from weathered to very hard in hardness.

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[1]Soister, Paul E., 1965, ***Geologic Map of the Fort Lupton Quadrangle, Colorado***, United States Geological Survey, Map GQ-397.

[2]Hart, Stephen S., 1972, ***Potentially Swelling Soil and Rock in the Boulder-Fort Collins-Greeley Area, Front Range-Urban Corridor Colorado***, Colorado Geological Survey, Sheet 1 of 4.

Laboratory test results indicate clay soils have a low to moderate expansive potential. The sand and silt soils, and sandstone bedrock are generally considered to be non- to low expansive. The claystone bedrock should be considered to be moderately to very highly expansive. Results of water soluble sulfate indicated values ranging from 0 to 410 mg/L.

Laboratory classification testing was performed on the subsurface soils obtained from Boring Nos. 7 through 10 where cut operations are anticipated to be performed. Following is a summary of the laboratory classification testing:

| **Boring No.** (Sample Depth) | **USCS Classification** | **AASHTO Classification** |
|---|---|---|
| **7** (0-7') | SM | A-2-4 (0) |
| **8** (0-3-1/2') | CL | A-4 (1) |
| **9** (0-4') | SC | A-6 (2) |
| **10** @ 2' | ML | A-4 (0) |
| **10** @ 4' | SM | A-2-4 (0) |

**Groundwater Conditions:** Groundwater was encountered at depths of about 5 to 22-1/2 feet below existing site grade in the majority of the borings at the time of field exploration. Groundwater was not observed in Boring Nos. 2, 8, and 10. When checked several days after drilling, groundwater was measured in the majority of the borings at depths of about 7 to 12 feet below existing site grade. However, Boring Nos. 2 and 10 had caved-in under dry conditions at depths of about 4 and 23 feet below existing site grade. Additionally, groundwater was not observed in Boring No. 8 when checked several days after drilling. These observations represent groundwater conditions at the time of the field exploration, and may not be indicative of other times or at other locations. Groundwater levels can be expected to fluctuate with varying seasonal and weather conditions.

Based upon review of U.S. Geological Survey Maps ([3]Hillier, et al, 1979), regional groundwater beneath the project area predominates in colluvial, landslide or windblown materials, or in fractured weathered consolidated sedimentary bedrock located at a depth near ground surface. Seasonal variations in groundwater conditions are expected since the aquifer materials may not be perennially saturated. Groundwater is generally encountered at depths ranging from 5 to 20 feet below ground surface; depth to seasonal groundwater is generally 10 feet or less.

Zones of perched and/or trapped groundwater may also occur at times in the subsurface soils overlying bedrock, on top of the bedrock surface or within permeable fractures in the

[3]Hillier, Donald E. and Schneider, Paul A., Jr., 1979, ***Depth to Water Table (1976-1977) in the Boulder-Fort Collins-Greeley Area, Colorado***, United States Geological Survey, Map I-855-I.

bedrock materials. The location and amount of perched water is dependent upon several factors, including hydrologic conditions, type of site development, irrigation demands on or adjacent to the site, fluctuations in water features, seasonal and weather conditions.

Fluctuations in groundwater levels can best be determined by implementation of a groundwater-monitoring plan. Such a plan would include installation of groundwater-monitoring wells, and periodic measurement of groundwater levels over a sufficient period of time.

The possibility of groundwater fluctuations should be considered when developing design and construction plans for the project.

## ENGINEERING ANALYSES AND PRELIMINARY RECOMMENDATIONS

The preliminary recommendations presented in this report are based on the assumption that the subsurface conditions do not deviate appreciably from those encountered in the borings. Supplementary geotechnical engineering exploration should be performed at the site upon completion of initial design studies. Supplemental geotechnical explorations will be used to confirm or modify the recommendations contained in this preliminary report.

**Geotechnical Considerations:** The site appears suitable for the proposed construction. Potentially moderately to very highly expansive claystone bedrock along with shallow groundwater conditions encountered at relatively shallow depths within some portions of the site will require particular attention in the design and construction.

Potentially moderately to very highly expansive claystone bedrock was encountered at relatively shallow depths within the majority of the site. Foundation systems and floor slabs designed to mitigate the expansive potential of the claystone bedrock may have to be incorporated in these areas. Additionally, shallow groundwater conditions were encountered within some portions of the site. Significant cuts may have to be limited or fill may have to be placed in these areas to reduce the effects of shallow groundwater conditions on full basement construction, if utilized. If basements are utilized, a minimum separation distance of about 4 to 6 feet should be maintained between foundations and groundwater levels.

Preliminary grading plans were available prior to the preparation of this report. Generally, maximum cut and fill depths on the order of about 1 to 4 feet are anticipated. The majority of the deep cut operations appear to be within the northern and northeastern portions of the site.

Based on the geotechnical engineering analyses, subsurface exploration and laboratory test results, we recommend that the proposed buildings could be supported on a grade beam and drilled pier or spread footing foundation systems. Drilled pier foundation systems will generally be required in areas where potentially expansive claystone bedrock is encountered at relatively shallow depths. If basement construction is not incorporated into the design of the structures, consideration could be given to supporting the proposed buildings on post-tensioned slab foundation systems. However, if potentially highly to very highly expansive claystone bedrock is encountered at or near slab bearing elevation, consideration should be given to partial removal of these materials to depths of about 3 to 5 feet, moisture conditioning and recompaction and/or replacement with non- to low expansive on-site or imported soils.

Slab-on-grade associated with the spread footing and drilled pier foundation options is considered acceptable when bearing on non- to low expansive soils provided that care is taken in the placement and compaction of the subgrade materials and that some movement can be tolerated. However, given the engineering characteristics of near surface expansive clays and claystone bedrock which may be encountered at or near floor slab bearing elevations, consideration should be given to partial removal of these materials to depths of about 3 to 5 feet, and replacement with non- to low expansive on-site or imported soils. If little or no movement can be tolerated, consideration should be given to the use of structural floor systems

Preliminary design and construction recommendations for foundation systems and other earth connected phases of the project are outlined below.

**Foundation Systems:**

**Drilled Straight Shaft Piers:** Due to the potential presence of moderately to very highly expansive claystone bedrock at relatively shallow depths within the majority of the site, a grade beam and drilled pier foundation system is considered applicable for support of the proposed structures. Straight shaft piers, drilled a minimum of 8 to 10 feet into medium hard or harder bedrock, with a minimum shaft length of 20 to 25 feet can be used for preliminary design purposes.

For axial compression loads, piers may be preliminarily designed for maximum end-bearing pressures ranging from 20,000 to 30,000 pounds per square foot (psf), and skin friction values ranging from 2,000 to 3,000 psf for the portion of the pier in medium hard or harder bedrock.

To reduce potential uplift forces on piers, small diameter piers and long grade beam spans, which increase individual pier loading, are recommended. A void space should be provided beneath grade beams, between piers. The void material should be of suitable strength to support the weight of fresh concrete used in grade beam construction and to avoid collapse when foundation backfill is placed.

Drilling to design depths should be possible with conventional single flight power augers. Groundwater conditions and caving soils across the site indicate that temporary steel casing will likely be required in some areas to properly drill and clean piers prior to concrete placement. Groundwater should be removed from each pier hole prior to concrete placement. Pier concrete should be placed immediately after completion of drilling and cleaning. If pier concrete cannot be placed in dry conditions, a tremie should be used for concrete placement. Due to potential sloughing and raveling, foundation concrete quantities may exceed calculated geometric volumes.

If casing is used for pier construction, it should be withdrawn in a slow continuous manner maintaining a sufficient head of concrete to prevent infiltration of water or the creation of voids in pier concrete. Pier concrete should have a relatively high fluidity when placed in cased pier holes or through a tremie.

**Spread Footings:** Due to the presence of non- to low expansive soils within some portions of the site, spread footing foundations bearing upon undisturbed non- to low expansive native soils or sandstone bedrock, recompacted native soils, and/or engineered fill are recommended for support of some of the proposed buildings. Additionally, a minimum separation distance of about 5 to 7 feet should be maintained between spread footings and potentially expansive claystone bedrock.

The footings may be designed for maximum bearing pressures ranging from about 1,500 to 2,500 psf. In addition, the footings may need to be sized to maintain minimum dead load pressures of about 500 to 800 psf. The design bearing pressure applies to dead loads plus design live load conditions. The design bearing pressures may be increased by one-third when considering total loads that include wind or seismic conditions.

Exterior footings should be placed a minimum of 36 inches below finished grade for frost protection and to provide confinement for the bearing soils. Interior footings should bear a minimum of 12 inches below finished grade. Finished grade is the lowest adjacent grade for perimeter footings and floor level for interior footings.

Footings should be proportioned to minimize differential foundation movement. Proportioning on the basis of equal total movement is recommended; however,

proportioning to relative constant dead load pressure will also reduce differential movement between adjacent footings. Total movement resulting from the assumed structural loads is estimated to be on the order of about 1 inch. Proper drainage should be provided in the preliminary design and during construction to reduce the settlement potential.

Areas of low density soils may be encountered at foundation bearing depth. When such conditions exist beneath planned footing areas, the subgrade soils should be removed and replaced as engineered fill.

**Post-Tensioned Slabs:** Post-tensioned slab construction can be considered as an alternate foundation system for support of the proposed buildings if basement construction is not incorporated into the design. However, potentially moderately to very highly expansive claystone bedrock encountered at or within foundation bearing elevation will require modification prior to slab construction. Modification would consist of partial removal of these materials to depths of about 3 to 5 feet, moisture conditioning and recompaction and/or replacement with non- to low on-site or imported soils. Post-tensioned slabs should be designed using criteria outlined by the Post-Tensioning Institute[4] based on the following:

- Maximum Allowable Bearing Pressure.....1,500 to 2,500 psf

- Edge Moisture Variation Distance, $e_m$
  - Center Lift Condition .....5.5 feet
  - Edge Lift Condition.....2.5 feet

- Estimated Maximum Settlement (sands or sandstone) ..... 1 inch
- Estimated Differential Settlement (sands or sandstone).....½ to 1 inch

- Differential Soil Movement, $y_m$
  - Center Lift Condition (clays and claystone) .....2 to 4 inches
  - Edge Lift Condition (clays and claystone) .....½ to 1-1/2 inches

- Slab-Subgrade friction coefficient, $\mu$
  - on polyethylene sheeting .....0.75
  - on cohesionless soils.....1.00
  - on cohesive soils.....2.00

[4] _____, (1996), ***Design and Construction of Post-Tensioned Slabs-on-Ground***, Post-Tensioning Institute, Second Edition.

Post-tensioned slabs, thickened or turndown edges and/or interior beams should be designed and constructed in accordance with the requirements of the Post-Tensioning Institute and the American Concrete Institute.

The above outlined differential soil movement values should also be considered as the potential amounts for tilting of the structures, which could be caused by non-uniform and significant wetting of the subsurface materials below the foundation, resulting in potential differential movements.

Exterior slab edges should be placed a minimum of 36 inches below finished grade for frost protection. Finished grade is the lowest adjacent grade for perimeter beams.

Masonry walls should be reinforced as necessary to reduce the potential for distress caused by differential foundation movement. The use of joints at openings or other discontinuities in masonry walls is recommended.

**Basement Construction:** Groundwater was encountered at depths of about 5 to 22-1/2 feet below existing site grade in the majority of the borings at the time of field exploration. However, groundwater was not encountered in Boring Nos. 2, 8 and 10 at the time of field exploration. When checked several days after drilling, groundwater was measured at depths of about 7 to 12 feet below existing site grade in some of the borings. However, groundwater was not observed in Boring 8, and dry caving had occurred in Boring Nos. 2 and 10 when checked several days after drilling. Therefore, full-depth basement construction is considered acceptable on the site provided that a minimum separation of 4 to 6 feet can be maintained between the bottom of the lowest foundation element and groundwater levels. Fill material should be placed or cut depths should be minimized in areas of shallow groundwater. If the site is not raised or cut depths are not limited, interceptor drains or underdrains will likely be required to mitigate groundwater conditions for basement construction.

Perched groundwater may occur at times since the subsurface soils are relatively impermeable and tend to trap water. Completion of site development, including installation of landscaping and irrigation systems, will likely lead to perched groundwater development.

To reduce the potential for perched groundwater to impact foundation bearing soils and enter the basement of the structure, installation of a perimeter drainage system is recommended. The drainage system should be constructed around the interior or exterior perimeter of the basement foundation, and sloped at a minimum 1/8 inch per foot to a suitable outlet, such as a sump and pump system.

**Lateral Earth Pressures:** For soils above any free water surface, recommended equivalent fluid pressures for unrestrained foundation elements are:

- Active:
  Cohesive soil backfill (on-site clay or silt)..... 50 to 55 psf/ft
  Cohesionless soil backfill (on-site sand, processed sandstone or imported soil) ..... 35 to 45 psf/ft
  Undisturbed subsoil..... 35 to 40 psf/ft
  On-site claystone bedrock materials.....not recommended for use

- Passive:
  Cohesive soil backfill (on-site clay or silt)..... 250 to 300 psf/ft
  Cohesionless soil backfill (on-site sand, processed sandstone or imported soil)..... 300 to 350 psf/ft
  Shallow grade beam and foundation walls..... 250 to 350 psf/ft
  Drilled Piers..... 400 to 500 psf/ft
  Undisturbed soils or bedrock ..... 400 to 500 psf/ft

- Coefficient of base friction ..... 0.35 to 0.40
- Adhesion at the base of footings ..... 500 to 750 psf

Where the design includes restrained elements, the following equivalent fluid pressures are recommended:

- At rest:
  Cohesive soil backfill (on-site clay or silt)..... 60 to 65 psf/ft
  Cohesionless soil backfill (on-site sand, processed sandstone or imported soil) ..... 50 to 60 psf/ft
  Undisturbed subsoil..... 60 to 70 psf/ft
  On-site claystone bedrock materials.....not recommended for use

The lateral earth pressures herein do not include any factor of safety and are not applicable for submerged soils/hydrostatic loading. Additional recommendations may be necessary if submerged conditions are to be included in the design.

Fill against grade beams, basement walls, and foundations should be well compacted. Compaction of each lift adjacent to walls should be accomplished with hand-operated tampers or other lightweight compactors. Claystone bedrock is not recommended as backfill materials for foundation and basement walls. Overcompaction may cause excessive lateral earth pressures which could result in wall movement.

**Seismic Considerations:** The project site is located in Seismic Risk Zone I of the Seismic Zone Map of the United States as indicated by the 1997 Uniform Building Code. Based upon the nature of the subsurface materials, Soil Profile Type "$S_C$" should be used for the design of structures for the proposed project (1997 Uniform Building Code, Table No. 16-J).

**Floor Slab Design and Construction:** The following recommendations are applicable with slabs-on-grade associated with the spread footing and drilled pier foundation options.

**Non- to Low Expansive Materials:** Due to the presence of non- to low expansive soils within some portions of the site, slab-on-grade construction is considered acceptable provided that care is taken in the placement and compaction of the subgrade soils and that some movement can be tolerated. Some differential movement of a slab-on-grade floor system is possible should these subgrade soils increase in moisture content. Movement on the order of about 1 to 2 inches is possible. Such movements are considered within general tolerance for normal slab-on-grade construction. To reduce any potential slab movements, the subgrade soils should be prepared as outlined in the "Earthwork" section of this report.

For preliminary structural design of concrete slabs-on-grade, a modulus of subgrade reaction of 100 pounds per cubic inch (pci) may be used for floors supported on existing or engineered fill consisting of on-site soils. A modulus of 200 pci may be used for floors supported on non-expansive imported fill meeting the specifications outlined below.

Additional floor slab design and construction recommendations for slabs supported on non- to low expansive soils are as follows:

- Positive separations and/or isolation joints should be provided between slabs and all foundations, columns or utility lines to allow independent movement.
- Contraction joints should be provided in slabs to control the location and extent of cracking.
- A minimum 1 to 2-inch void space should be constructed above, or below non-bearing partition walls placed on the floor slab. Special framing details should be provided at doorjambs and frames within partition walls to avoid potential distortion. Partition walls should be isolated from suspended ceilings.
- Interior trench backfill placed beneath slabs should be compacted in accordance with recommended specifications outlined below.

- If moisture sensitive floor coverings are used on interior slabs, consideration should be given to the use of barriers to minimize potential vapor rise through the slab.

- Floor slabs should not be constructed on frozen subgrade.

- Other design and construction considerations, as outlined in the ACI Design Manual, Section 302.1R are recommended.

**Moderately to Very Highly Expansive Materials:** Due to the potential presence of moderately to very highly expansive claystone bedrock at or near basement bearing elevations within the majority of the site, differential movement of floor slab-on-grade may occur should the claystone bedrock undergo changes in moisture content. Movement on the order of 2 to 3 inches or more is possible. A common practice to reduce potential slab heave involves overexcavation of the potentially expansive claystone bedrock materials encountered at or within slab bearing elevation to depths of about 3 to 5 feet, and replacement with non- to low on-site or imported soils. This alternative will not eliminate the possibility of slab heave; but movements should be reduced and tend to be more uniform. If little or no movement can be tolerated, consideration should be given to using structural floor systems.

**Preliminary Pavement Design and Construction:** Preliminary design of pavements for the project have been based on the procedures outlined in the 1993 "Guideline for Design of Pavement Structures" by the American Association of State Highway and Transportation Officials (AASHTO). As discussed, the design presented herein is for preliminary planning purposes for the project. For pavement areas located within City of Fort Lupton right-of-way, a pavement design report meeting the City of Fort Lupton specifications will be required.

Traffic criteria assumed for pavement thickness designs include single 18-kip equivalent single axle loads (ESAL's) of 36,500 for automobile parking, and 109,500 for drive lanes.

Based upon AASHTO criteria, Colorado is located within Climatic Region VI of the United States. This region is characterized as being dry, with hard ground freeze and spring thaw. The spring thaw condition typically results in saturated or near-saturated subgrade soil moisture conditions. The AASHTO criteria suggest that these moisture conditions are prevalent for approximately 12-½ percent of the annual moisture variation cycle.

Local drainage characteristics of proposed pavement areas are considered to vary from fair to good depending upon location on the site. For purposes of this preliminary design analysis, fair drainage characteristics are considered to control the design. These

characteristics, coupled with the approximate duration of saturated subgrade conditions, results in a design drainage coefficient of 1.0 when applying the AASHTO criteria for design.

For preliminary flexible pavement design, a terminal serviceability index of 2.0 was utilized along with an inherent reliability of 85 percent and a design life of 20 years. Using the correlated design R-value, appropriate ESAL, environmental criteria and other factors, the structural numbers (SN) of the pavement sections were determined on the basis of the 1993 AASHTO design equation.

In addition to the preliminary flexible pavement design analyses, a preliminary rigid pavement design analysis was completed, based upon AASHTO design procedures. Rigid pavement design is based on an evaluation of the Modulus of Subgrade Reaction of the soils (K-value), the Modulus of Rupture of the concrete, and other factors previously outlined. The preliminary design K-value for the subgrade soil was determined by correlation to the laboratory tests results. A modulus of rupture of 600 psi (working stress 450 psi) was used for pavement concrete. The rigid pavement thickness for each traffic category was determined on the basis of the AASHTO design equation.

Recommended alternatives for flexible and rigid pavements, summarized for each traffic area, are as follows:

| Traffic Area | Alternative | Recommended Pavement Thickness (Inches) | | | |
|---|---|---|---|---|---|
| | | Asphalt Concrete Surface | Aggregate Base Course | Portland Cement Concrete | Total |
| Automobile Parking | A | 6 | | | 6 |
| | B | 4 | 7 | | 11 |
| | C | | | 5* | 5* |
| Main Traffic Corridors | A | 7 | | | 7 |
| | B | 5 | 7 | | 12 |
| | C | | | 5* | 5* |

* Minimum pavement section thickness according to AASHTO

It should be noted that the above calculated sections were based on the correlated soil properties of the clay soils. Thinner sections are anticipated for pavements supported on sandy soils, as well as thicker sections for pavements supported on claystone bedrock. Additionally, swell mitigation may be required in areas where potentially expansive claystone bedrock is encountered at shallow depths.

A final pavement design should be completed subsequent to mass grading operations to confirm or modify the preliminary pavement thickness alternatives. The final design will account for variations in the pavement subgrade soils within paved areas and may have to meet the City of Fort Lupton or Weld County requirements. Accordingly, the actual thickness may vary from those outlined above.

Each alternative should be investigated with respect to current material availability and economic conditions. Rigid concrete pavement, a minimum of 6 inches in thickness, is recommended at the location of dumpsters where trash trucks park and load.

Aggregate base course (if used on the site) should consist of a blend of sand and gravel which meets strict specifications for quality and gradation. Use of materials meeting Colorado Department of Transportation (CDOT) Class 5 or 6 specifications is recommended for base course.

Aggregate base course should be placed in lifts not exceeding 6 inches and should be compacted to a minimum of 95 percent standard Proctor density (ASTM D698).

Where rigid pavements are used, materials meeting CDOT Class P specifications are recommended. Other specifications outlined by the City of Fort Lupton or Weld County should be followed.

The performance of all pavements can be enhanced by minimizing excess moisture which can reach the subgrade soils. The following preliminary recommendations should be considered at minimum:

- site grading at a minimum 2 percent grade away from the pavements;
- compaction of any utility trenches for landscaped areas to the same criteria as the pavement subgrade;
- sealing all landscaped areas in or adjacent to pavements to minimize or prevent moisture migration to subgrade soils;
- placing compacted backfill against the exterior side of curb and gutter; and,
- placing curb, gutter and/or sidewalk directly on subgrade soils without the use of base course materials.

**Borrow Fill Materials:** We understand materials derived from cut operations on the site may be used as subgrade materials for Mountain View Avenue within Filing No. 5 of the development if found to meet the specifications outlined in the referenced geotechnical engineering report. Based upon review of laboratory classification test results, it appears that the surface soils appear to be of the same or higher quality and meet the specifications

outlined in the referenced report. Therefore, it is our opinion that these materials could be used beneath pavements along Mountain View Boulevard.

**Earthwork:**

**General Considerations:** The following presents recommendations for site preparation, excavation, subgrade preparation and placement of engineered fills on the project.

All earthwork on the project should be observed and evaluated by Terracon. The evaluation of earthwork should include observation and testing of engineered fill, subgrade preparation, foundation bearing soils, and other geotechnical conditions exposed during the construction of the project.

**Site Preparation:** Strip and remove existing vegetation, debris, and other deleterious materials from proposed building and pavement areas. All exposed surfaces should be free of mounds and depressions which could prevent uniform compaction.

Stripped materials consisting of vegetation and organic materials should be wasted from the site, or used to revegetate landscaped areas or exposed slopes after completion of grading operations.

The site should be initially graded to create a relatively level surface to receive fill, and to provide for a relatively uniform thickness of fill beneath proposed building structures.

All exposed areas which will receive fill, once properly cleared, should be scarified to a minimum depth of 10 inches, conditioned to near optimum moisture content, and compacted.

Although evidence of fills or underground facilities such as septic tanks, cesspools, basements, and utilities was not observed during the site reconnaissance, such features could be encountered during construction. If unexpected fills or underground facilities are encountered, such features should be removed and the excavation thoroughly cleaned prior to backfill placement and/or construction.

It is anticipated that excavations for the proposed construction can be accomplished with conventional earthmoving equipment. If excavations need to penetrate into the bedrock, ripping or jack-hammering may be needed to advance the excavation.

Depending upon depth of excavation and seasonal conditions, groundwater may be encountered in excavations on the site. Pumping from sumps may be utilized to control

water within excavations. Well points may be required for significant groundwater flow, or where excavations penetrate groundwater to a significant depth.

Based upon the subsurface conditions determined from the geotechnical exploration, subgrade soils exposed during construction are anticipated to be relatively stable. However, the stability of the subgrade may be affected by precipitation, proximity to the existing irrigation ditch and golf course, proximity to existing groundwater conditions, repetitive construction traffic or other factors. If unstable conditions develop, workability may be improved by scarifying and drying. Overexcavation of wet zones and replacement with granular materials may be necessary. Use of lime, fly ash, kiln dust, cement or geotextiles could also be considered as a stabilization technique. Laboratory evaluation is recommended to determine the effect of chemical stabilization on subgrade soils prior to construction. Lightweight excavation equipment may be required to reduce subgrade pumping.

The individual contractor(s) is responsible for designing and constructing stable, temporary excavations as required to maintain stability of both the excavation sides and bottom. All excavations should be sloped or shored in the interest of safety following local and federal regulations, including current OSHA excavation and trench safety standards.

**Subgrade Preparation:** Subgrade soils beneath interior and exterior slabs, and beneath pavements should be scarified, moisture conditioned and compacted to a minimum depth of 12 inches. The moisture content and compaction of subgrade soils should be maintained until slab or pavement construction.

**Fill Materials and Placement:** Clean on-site soils or approved imported materials may be used as fill material.

Imported soils (if required) should conform to the following:

| **Gradation** | **Percent finer by weight (ASTM C136)** |
|---|---|
| 6" | 100 |
| 3" | 70-100 |
| No. 4 Sieve | 50-100 |
| No. 200 Sieve | 50 (max) |

- Liquid Limit ..... 30 (max)
- Plasticity Index ..... 15 (max)
- Maximum expansive potential (%)* ..... 1.5

*Measured on a sample compacted to approximately 95 percent of the ASTM D698 maximum dry density at about 3 percent below optimum water content. The sample is confined under a 100 psf surcharge and submerged.

Engineered fill should be placed and compacted in horizontal lifts, using equipment and procedures that will produce recommended moisture contents and densities throughout the lift. Engineered fill should be compacted to a minimum of 95 percent of the standard Proctor density test (ASTM D698).

On-site clay soils and processed claystone should be compacted within a moisture content range of optimum to 3 percent above optimum. On-site sands, processed sandstone and/or imported soils should be compacted within a moisture range of 3 percent below to 3 percent above optimum unless modified by the project geotechnical engineer.

**Shrinkage:** For balancing grading plans, estimated shrink or swell of soils and bedrock when used as compacted fill following recommendations in this report are as follows:

| Material | Estimated Shrink (-) Swell (+) Based on ASTM D698 |
|---|---|
| On-site soils: | |
| Clays and silts | +5 to -10% |
| Sands | -5 to -15% |
| On-site bedrock materials: | |
| Claystone | +5 to +10% |
| Sandstone | -5 to -10% |

**Slopes:** For permanent slopes in compacted fill areas less than about 12 feet in height, recommended maximum configurations for on-site materials is 3 (Horizontal):1 (Vertical).

The face of all slopes should be compacted to the minimum specification for fill embankments. Alternately, fill slopes can be over-built and trimmed to compacted material.

For permanent slopes in cut areas less than about 12 feet in height, recommended maximum configurations for on-site materials are as follows:

| Material | Maximum Slope Horizontal:Vertical |
|---|---|
| Cohesive soils (clays and silts) | 3:1 |
| Cohesionless soils (sands) | 2-1/2:1 |
| Bedrock | 2:1 |

If steeper slopes are required for site development, stability analyses should be completed to design the grading plan.

Saturation or near saturation of the slopes may likely result in slope failure, even if the slopes are constructed to the recommended configurations. If saturated conditions are likely, due to irrigation, surface flows or other sources, Terracon should be informed and stability analyses should be performed.

**Excavation and Trench Construction:** Excavations into the on-site soils will encounter a variety of conditions. Excavations into the clays and bedrock can be expected to stand on relatively steep temporary slopes during construction. However, caving soils and groundwater may also be encountered. The individual contractor(s) should be made responsible for designing and constructing stable, temporary excavations as required to maintain stability of both the excavation sides and bottom. All excavations should be sloped or shored in the interest of safety following local and federal regulations, including current OSHA excavation and trench safety standards.

The soils to be penetrated by the proposed excavations may vary significantly across the site. The contractor should verify that similar conditions exist throughout the proposed area of excavation. If different subsurface conditions are encountered at the time of construction, the actual conditions should be evaluated to determine any excavation modifications necessary to maintain safe conditions.

As a safety measure, it is recommended that all vehicles and soil piles be kept to a minimum lateral distance from the crest of the slope equal to no less than the slope height. The exposed slope face should be protected against the elements.

**Additional Design and Construction Considerations:**

**Exterior Slab Design and Construction:** Compacted subgrade or existing clay soils and claystone will expand with increasing moisture content; therefore, exterior concrete grade slabs may heave, resulting in cracking or vertical offsets. The potential for

damage would be greatest where exterior slabs are constructed adjacent to the building or other structural elements. To reduce the potential for damage, we recommend:

- exterior slabs be supported on fill with no, or very low expansion potential;
- strict moisture-density control during placement of subgrade fills;
- placement of effective control joints on relatively close centers and isolation joints between slabs and other structural elements;
- provision for adequate drainage in areas adjoining the slabs; and
- use of designs which allow vertical movement between the exterior slabs and adjoining structural elements.

In those locations where movement of exterior slabs must be held to a minimum, consideration should be given to:

- constructing slabs with a stem or key-edge, a minimum of 6 inches in width and at least 12 inches below grade;
- supporting keys or stems on drilled piers; or
- providing structural exterior slabs supported on foundations similar to the building.

**Underground Utility Systems:** All piping should be adequately bedded for proper load distribution. Where utilities are excavated below groundwater, temporary dewatering will be required during excavation, pipe placement and backfilling operations for proper construction. Utility trenches should be excavated on safe and stable slopes in accordance with OSHA regulations as discussed above. Backfill should consist of the on-site soils or existing bedrock. If bedrock is used, all plus 6-inch material should be removed from it prior to its use. The pipe backfill should be compacted to a minimum of 95 percent of Standard Proctor Density ASTM D698.

All underground piping within or near the proposed structure should be designed with flexible couplings, so minor deviations in alignment do not result in breakage or distress. Utility knockouts in grade beams should be oversized to accommodate differential movements.

**Corrosion Protection:** Results of soluble sulfate testing indicate that ASTM Type II Portland cement is suitable for all concrete on and below grade. Foundation concrete should be designed for moderate sulfate exposure in accordance with the provisions of the ACI Design Manual, Section 318, Chapter 4.

**Surface Drainage:** Positive drainage should be provided during construction and maintained throughout the life of the proposed project. Infiltration of water into utility or foundation excavations must be prevented during construction. Planters and other surface features which could retain water in areas adjacent to the building or pavements should be sealed or eliminated. In areas where sidewalks or paving do not immediately adjoin the structure, we recommend that protective slopes be provided with a minimum grade of approximately 10 percent for at least 5 feet from perimeter walls. Backfill against footings, exterior walls, and in utility and sprinkler line trenches should be well compacted and free of all construction debris to reduce the possibility of moisture infiltration.

Downspouts, roof drains or scuppers should discharge into splash blocks or extensions when the ground surface beneath such features is not protected by exterior slabs or paving. Sprinkler systems should not be installed within 5 feet of foundation walls. Landscaped irrigation adjacent to the foundation system should be minimized or eliminated.

## GENERAL COMMENTS

Supplemental exploration and analyses should be undertaken in order to develop final design parameters and to confirm and/or modify the preliminary recommendations and conclusions contained in this report.

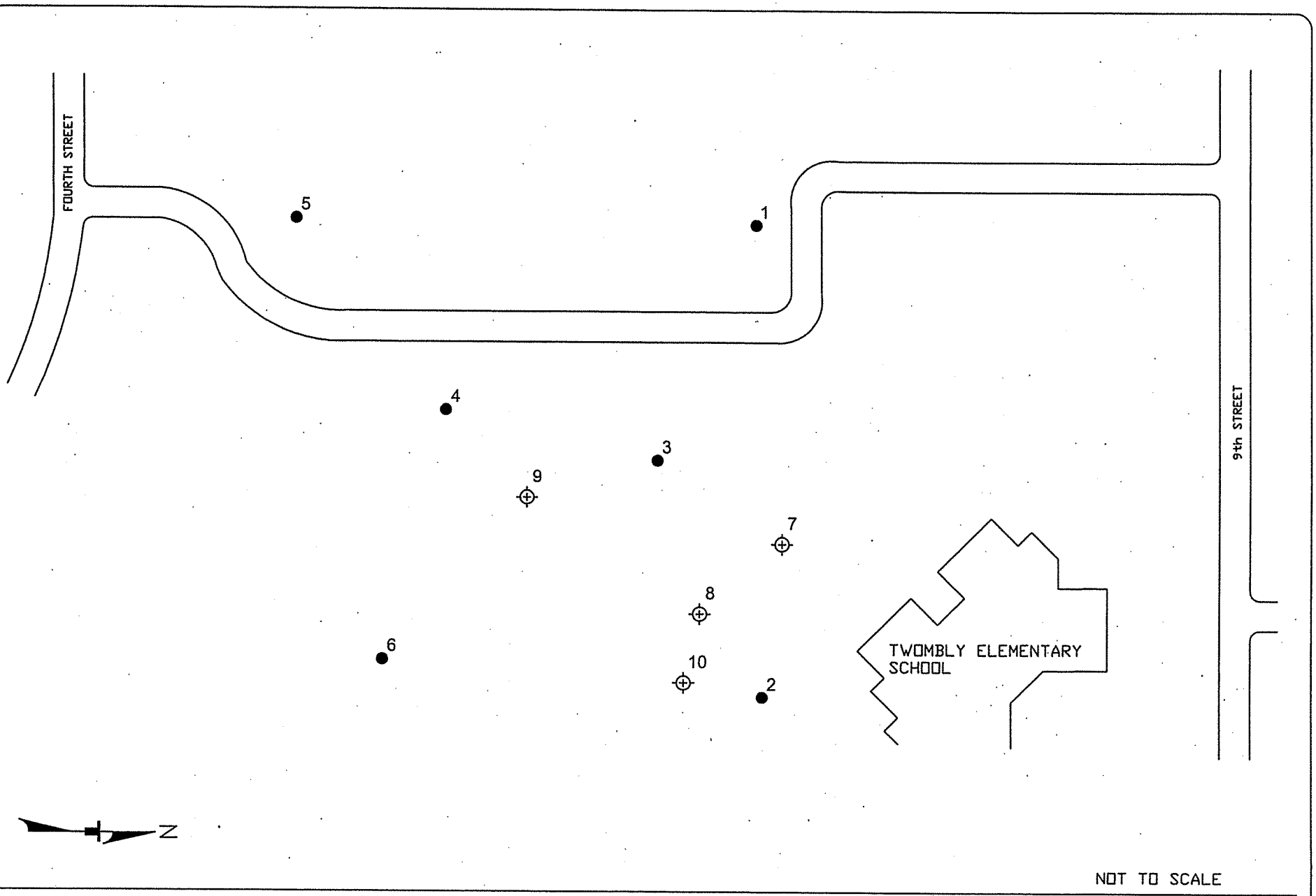
Terracon should be retained to review the final design plans and specifications so comments can be made regarding interpretation and implementation of our geotechnical recommendations in the design and specifications. Terracon also should be retained to provide testing and observation during excavation, grading, foundation and construction phases of the project.

The analysis and recommendations presented in this preliminary report are based upon the data obtained from the borings performed at the indicated locations and from other information discussed in this report. This report does not reflect variations that may occur between borings, across the site, or due to the modifying effects of weather. The nature and extent of such variations may not become evident until during or after construction. If variations appear, we should be immediately notified so that further evaluation and supplemental recommendations can be provided.

The scope of services for this project does not include, either specifically or by implication, any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is

concerned about the potential for such contamination or pollution, other studies should be undertaken.

This preliminary report has been prepared for the exclusive use of our client for specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. No warranties, either express or implied, are intended or made. Site safety, excavation support, and dewatering requirements are the responsibility of others. In the event that changes in the nature, design, or location of the project as outlined in this report are planned, the conclusions and recommendations contained in this report shall not be considered valid unless Terracon reviews the changes and either verifies or modifies the conclusions of this report in writing.




NOT TO SCALE

## FIGURE-1 BORING LOCATION MAP

7 APPROXIMATE BORROW PIT BORING LOCATION

1 APPROXIMATE BORING LOCATION

PARCEL A - COYOTE CREEK SUBDIVISION
FORT LUPTON, COLORADO

PROJECT NUMBER: 25025241 DATE: OCTOBER 25, 2002 DRAWN BY: KMS

Terracon

# LOG OF BORING NO. 1



CLIENT: Matrix Funding Corporation

PROJECT: Proposed Multi- Family Residential Development

SITE: Fort Lupton, Colorado

PROJECT: Parcel A- Coyote Creek Subdivision

Approx. Surface Elev.: 4913.5 ft

| GRAPHIC LOG | DESCRIPTION | DEPTH, ft. | USCS SYMBOL | SAMPLES NUMBER | SAMPLES TYPE | SAMPLES RECOVERY, in. | SAMPLES BLOWS / in. | TESTS WATER CONTENT, % | TESTS DRY UNIT WT pcf | TESTS UNCONFINED STRENGTH, psf | TESTS % Swell or Consol/ Surcharge Load |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | SILTY SAND, fine to coarse grained, loose to medium dense, brown to dark brown, dry to moist | | | | | | | | | | |
| | | | SM | 1 | RS | 12 | 29/12 | 4 | 105 | | |
| | | 5 | SM | 2 | RS | 12 | 10/12 | 9 | 101 | | -1.6/ 500PSF |
| | 6 4907.5 | | | | | | | | | | |
| | LEAN CLAY, with sand, stiff, brown, moist | | CL | 3 | RS | 12 | 14/12 | | | | |
| | | 10 | | | | | | | | | |
| | 14.5 4899 | | | | | | | | | | |
| | SANDY CLAYSTONE, firm to hard, gray to brown, moist to wet, with sandstone lenses | | | 4 | RS | 12 | 39/12 | | | | |
| | | 15 | | | | | | | | | |
| | | | | 5 | RS | 6 | 50/6 | | | | |
| | 20.5 4893 | 20 | | | | | | | | | |
| | SANDSTONE, fine grained, very hard, strongly cemented, brown, moist to wet | | | | | | | | | | |
| | | | | 6 | RS | 4 | 50/4 | | | | |
| | 25 4888.5 | 25 | | | | | | | | | |
| | Stopped boring at 25 feet | | | | | | | | | | |

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

| WATER LEVEL OBSERVATIONS, ft | | | | |
|---|---|---|---|---|
| WL | ▽ 19.5 | WD | ▽ 10 | 10/16/02 |
| WL | ▽ | | ▽ | |
| WL | | | | |

Terracon

| | | | |
|---|---|---|---|
| BORING STARTED | 10-10-02 | | |
| BORING COMPLETED | 10-10-02 | | |
| RIG | CME 55 | FOREMAN | SF |
| APPROVED | MEA | JOB # | 25025241 |

BOREHOLE 99 25025241.GPJ TERRACON.GDT 10/29/02

# LOG OF BORING NO. 2



CLIENT: Matrix Funding Corporation

PROJECT: Proposed Multi- Family Residential Development

SITE: Fort Lupton, Colorado

PROJECT: Parcel A- Coyote Creek Subdivision

| GRAPHIC LOG | DESCRIPTION | DEPTH, ft. | USCS SYMBOL | SAMPLES NUMBER | SAMPLES TYPE | SAMPLES RECOVERY, in. | SAMPLES BLOWS / in. | TESTS WATER CONTENT, % | TESTS DRY UNIT WT pcf | TESTS UNCONFINED STRENGTH, psf | % Swell or Consol/ Surcharge Load |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Approx. Surface Elev.: 4925 ft | | | | | | | | | | |
| | SILTY SAND, fine to medium grained, medium dense, tan to light brown, iron staining, dry to moist | | SM | 1 | RS | 12 | 29/12 | 2 | 102 | | |
| | 3.5 4921.5 | | | | | | | | | | |
| | SANDSTONE, fine grained, firm, weak cementation, brown, iron staining, moist | | | 2 | RS | 12 | 34/12 | 2 | 112 | | |
| | 6.5 4918.5 | 5 | | | | | | | | | |
| | CLAYSTONE, firm to medium hard, dark brown to gray, trace lignite, moist | | | 3 | RS | 12 | 36/12 | 14 | 117 | | +10.5/ 500PSF |
| | | 10 | | | | | | | | | |
| | | | | 4 | RS | 12 | 32/12 | | | | |
| | | 15 | | | | | | | | | |
| | | | | 5 | RS | 10 | 50/10 | | | | |
| | | 20 | | | | | | | | | |
| | 25 4900 | 25 | | | | | | | | | |
| | Stopped boring at 25 feet | | | | | | | | | | |

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

| WATER LEVEL OBSERVATIONS, ft | | |
|---|---|---|
| WL | NONE WD | DCI@10/16/02 |
| WL | | |
| WL | | |

Terracon

| | | | |
|---|---|---|---|
| BORING STARTED | 10-10-02 | | |
| BORING COMPLETED | 10-10-02 | | |
| RIG | CME 55 | FOREMAN | SF |
| APPROVED | MEA | JOB # | 25025241 |

BOREHOLE 99 25025241.GPJ TERRACON.GDT 10/29/02

# LOG OF BORING NO. 3



CLIENT: Matrix Funding Corporation

PROJECT: Proposed Multi- Family Residential Development

SITE: Fort Lupton, Colorado

PROJECT: Parcel A- Coyote Creek Subdivision

| GRAPHIC LOG | DESCRIPTION | DEPTH, ft. | USCS SYMBOL | SAMPLES NUMBER | SAMPLES TYPE | SAMPLES RECOVERY, in. | SAMPLES BLOWS / in. | TESTS WATER CONTENT, % | TESTS DRY UNIT WT pcf | TESTS UNCONFINED STRENGTH, psf | % Swell or Consol/ Surcharge Load |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Approx. Surface Elev.: 4920 ft | | | | | | | | | | |
| | SANDY LEAN CLAY, very stiff, light brown to brown, dry to moist | | CL | 1 | RS | 12 | 33/12 | 10 | 102 | | |
| | 3.5 4916.5 | | | | | | | | | | |
| | CLAYSTONE, with sand, weathered to hard, gray to brown, iron staining, moist to wet, varies to SANDY CLAYSTONE | | | 2 | RS | 12 | 21/12 | 11 | 108 | | +2.1/ 500PSF |
| | | 5 | | | | | | | | | |
| | | | | 3 | RS | 12 | 24/12 | | | | |
| | | 10 | | | | | | | | | |
| | | | | 4 | RS | 12 | 41/12 | | | | |
| | | 15 | | | | | | | | | |
| | 20 4900 | | | 5 | RS | 8 | 50/8 | | | | |
| | Stopped boring at 20 feet | 20 | | | | | | | | | |

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

| WATER LEVEL OBSERVATIONS, ft | | | | |
|---|---|---|---|---|
| WL | ▽ 14.5 | WD | ▼ 8 | 10/16/02 |
| WL | ▽ | | ▼ | |
| WL | | | | |

Terracon

| | | | |
|---|---|---|---|
| BORING STARTED | 10-10-02 | | |
| BORING COMPLETED | 10-10-02 | | |
| RIG | CME 55 | FOREMAN | SF |
| APPROVED | MEA | JOB # | 25025241 |

BOREHOLE 99 25025241.GPJ TERRACON.GDT 10/29/02

# LOG OF BORING NO. 4



CLIENT: Matrix Funding Corporation

PROJECT: Proposed Multi- Family Residential Development

SITE: Fort Lupton, Colorado

PROJECT: Parcel A- Coyote Creek Subdivision

| GRAPHIC LOG | DESCRIPTION | DEPTH, ft. | USCS SYMBOL | SAMPLES NUMBER | SAMPLES TYPE | SAMPLES RECOVERY, in. | SAMPLES BLOWS / in. | TESTS WATER CONTENT, % | TESTS DRY UNIT WT pcf | TESTS UNCONFINED STRENGTH, psf | % Swell or Consol/ Surcharge Load |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Approx. Surface Elev.: 4920.5 ft | | | | | | | | | | |
| | SANDY LEAN CLAY, very stiff, brown, dry to moist | | | | | | | | | | |
| | 3 4917.5 | | CL | 1 | RS | 12 | 29/12 | 6 | 108 | | -1.5/ 500PSF |
| | CLAYEY SAND, fine grained, medium dense, light brown, dry to moist | | SC | 2 | RS | 12 | 23/12 | 6 | 112 | | |
| | 5.5 4915 | 5 | | | | | | | | | |
| | SANDY CLAYSTONE, medium hard, brown, iron staining, moist to wet | | | 3 | RS | 12 | 50/12 | 15 | 117 | | |
| | 12.5 ▽ 4908 | 10 | | | | | | | | | |
| | CLAYSTONE, with sand, firm, dark brown to gray brown, iron staining, moist to wet | | | 4 | RS | 12 | 39/12 | | | | |
| | 17.5 4903 | 15 | | | | | | | | | |
| | SANDSTONE, fine grained, medium hard, weak to moderate cementation, brown, moist to wet | | | 5 | RS | 11 | 50/11 | | | | |
| | 20 4900.5 | 20 | | | | | | | | | |
| | Stopped boring at 20 feet | | | | | | | | | | |

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

| WATER LEVEL OBSERVATIONS, ft | | | | |
|---|---|---|---|---|
| WL | ▽ 12.5 | WD | ▽ 9.5 | 10/16/02 |
| WL | ▽ | | ▽ | |
| WL | | | | |

Terracon

| | | | |
|---|---|---|---|
| BORING STARTED | 10-10-02 | | |
| BORING COMPLETED | 10-10-02 | | |
| RIG | CME 55 | FOREMAN | SF |
| APPROVED | MEA | JOB # | 25025241 |

BOREHOLE 99 25025241.GPJ TERRACON.GDT 10/29/02

# LOG OF BORING NO. 5



CLIENT: Matrix Funding Corporation

PROJECT: Proposed Multi- Family Residential Development

SITE: Fort Lupton, Colorado

PROJECT: Parcel A- Coyote Creek Subdivision

| GRAPHIC LOG | DESCRIPTION | DEPTH, ft. | USCS SYMBOL | SAMPLES NUMBER | SAMPLES TYPE | SAMPLES RECOVERY, in. | SAMPLES BLOWS / in. | TESTS WATER CONTENT, % | TESTS DRY UNIT WT pcf | TESTS UNCONFINED STRENGTH, psf | % Swell or Consol/ Surcharge Load |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Approx. Surface Elev.: 4916.5 ft | | | | | | | | | | |
| | SILTY SAND, fine to coarse grained, trace gravel, loose, dark brown, moist | 3 | SM | 1 | RS | 12 | 17/12 | 11 | 117 | | |
| | CLAYSTONE, weathered, light gray to grey, moist | 4913.5 | | | | | | | | | |
| | | 7 | | 2 | RS | 12 | 12/12 | 15 | 116 | | -0.3/ 500PSF |
| | SANDSTONE, fine grained, some clay, medium hard to very hard, weakly to strongly cemented, grey to light brown, moist to wet ▼ ▽ | 4909.5 | | | | | | | | | |
| | | 10 | | 3 | RS | 9 | 50/9 | | | | |
| | | 15 | | 4 | RS | NR | 50/5 | | | | |
| | | 20 | | 5 | RS | 8 | 50/8 | | | | |
| | | 4896.5 | | | | | | | | | |
| | Stopped boring at 20 feet | | | | | | | | | | |

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

| WATER LEVEL OBSERVATIONS, ft | | | | |
|---|---|---|---|---|
| WL | ▽ 14 | WD | ▼ 11 | 10/16/02 |
| WL | ▽ | | ▼ | |
| WL | | | | |

Terracon

| | | | |
|---|---|---|---|
| BORING STARTED | 10-10-02 | | |
| BORING COMPLETED | 10-10-02 | | |
| RIG | CME 55 | FOREMAN | SF |
| APPROVED | MEA | JOB # | 25025241 |

BOREHOLE 99 25025241.GPJ TERRACON.GDT 10/29/02

# LOG OF BORING NO. 6



CLIENT: Matrix Funding Corporation

PROJECT: Proposed Multi- Family Residential Development

SITE: Fort Lupton, Colorado

PROJECT: Parcel A- Coyote Creek Subdivision

Approx. Surface Elev.: 4930 ft

| DESCRIPTION | DEPTH, ft. | USCS SYMBOL | SAMPLES NUMBER | SAMPLES TYPE | SAMPLES RECOVERY, in. | SAMPLES BLOWS / in. | TESTS WATER CONTENT, % | TESTS DRY UNIT WT pcf | TESTS UNCONFINED STRENGTH, psf | % Swell or Consol/ Surcharge Load |
|---|---|---|---|---|---|---|---|---|---|---|
| SILTY SAND, fine grained, loose, light gray, moist | 4 | SM | 1 | RS | 12 | 9/12 | 9 | 112 | | -0.6/ 500PSF |
| | | | 2 | RS | 12 | 14/12 | 11 | 104 | | |
| SILTY SANDSTONE, fine to medium grained, trace claystone fragments, weathered, weakly cemented, light gray to yellow brown, moist to wet | 5 | | | | | | | | | |
| | 10 | | 3 | RS | 12 | 13/12 | 22 | 103 | | |
| | 12 | | | | | | | | | |
| SANDY CLAYSTONE, firm to medium hard, gray to brown, moist | 15 | | 4 | RS | 12 | 38/12 | | | | |
| | 20 | | 5 | RS | 9 | 50/9 | | | | |
| Stopped boring at 20 feet | | | | | | | | | | |

4926 4918 4910

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

| WATER LEVEL OBSERVATIONS, ft | | | | |
|---|---|---|---|---|
| WL | ▽ 5 | WD | ▼ 7 | 10/16/02 |
| WL | ▽ | | ▼ | |
| WL | | | | |

Terracon

| | | | |
|---|---|---|---|
| BORING STARTED | 10-10-02 | | |
| BORING COMPLETED | 10-10-02 | | |
| RIG | CME 55 | FOREMAN | SF |
| APPROVED | MEA | JOB # | 25025241 |

BOREHOLE 99 25025241.GPJ TERRACON.GDT 10/29/02

# LOG OF BORING NO. 7



CLIENT: Matrix Funding Corporation

PROJECT: Proposed Multi- Family Residential Development

SITE: Fort Lupton, Colorado

PROJECT: Parcel A- Coyote Creek Subdivision

| GRAPHIC LOG | DESCRIPTION | DEPTH, ft. | USCS SYMBOL | SAMPLES NUMBER | SAMPLES TYPE | SAMPLES RECOVERY, in. | SAMPLES BLOWS / in. | TESTS WATER CONTENT, % | TESTS DRY UNIT WT pcf | TESTS UNCONFINED STRENGTH, psf | TESTS % Swell or Consol/ Surcharge Load |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Approx. Surface Elev.: 4920.5 ft | | | | | | | | | | |
| | SILTY SAND, fine to coarse grained, medium dense, brown, dry to moist | | SM | 1 | GRAB | | | | | | |
| | | | SM | 2 | RS | 12 | 26/12 | 4 | 102 | | |
| | | 5 | SM | 3 | RS | 12 | 41/12 | 3 | 108 | | |
| | 7 4913.5 | | | | | | | | | | |
| | CLAYSTONE, trace sand, firm, dark brown, iron staining, moist ▼ | | | 4 | GRAB | | | | | | |
| | | 10 | | 5 | RS | 12 | 30/12 | 16 | 116 | | +3.0/ 500PSF |
| | 12 4908.5 | | | | | | | | | | |
| | SANDY CLAYSTONE, medium hard, light gray, moist | 15 | | 6 | RS | 10 | 50/10 | | | | |
| | 17.5 4903 | | | | | | | | | | |
| | SANDSTONE, fine grained, very hard, weakly cemented, light brown, moist to wet ▽ | 20 | | 7 | RS | 5 | 50/5 | | | | |
| | 20 4900.5 | | | | | | | | | | |
| | Stopped boring at 20 feet | | | | | | | | | | |

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

| WATER LEVEL OBSERVATIONS, ft | | | | |
|---|---|---|---|---|
| WL | ▽ 18 | WD | ▽ 10 | 10/16/02 |
| WL | ▽ | | ▽ | |
| WL | | | | |

Terracon

| | | | |
|---|---|---|---|
| BORING STARTED | 10-10-02 | | |
| BORING COMPLETED | 10-10-02 | | |
| RIG | CME 55 | FOREMAN | SF |
| APPROVED | MEA | JOB # | 25025241 |

BOREHOLE 99 25025241.GPJ TERRACON.GDT 10/29/02

# LOG OF BORING NO. 8



CLIENT: Matrix Funding Corporation

PROJECT: Proposed Multi- Family Residential Development

SITE: Fort Lupton, Colorado

PROJECT: Parcel A- Coyote Creek Subdivision

| GRAPHIC LOG | DESCRIPTION | DEPTH, ft. | USCS SYMBOL | SAMPLES NUMBER | SAMPLES TYPE | SAMPLES RECOVERY, in. | SAMPLES BLOWS / in. | TESTS WATER CONTENT, % | TESTS DRY UNIT WT pcf | TESTS UNCONFINED STRENGTH, psf | % Swell or Consol/ Surcharge Load |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Approx. Surface Elev.: 4923.5 ft | | | | | | | | | | |
| | SANDY LEAN CLAY, very stiff, brown, dry to moist | | CL | 1 | GRAB | | | | | | |
| | | | CL | 2 | RS | 12 | 27/12 | 14 | 89 | | |
| | 3.5 4920 | | | | | | | | | | |
| | CLAYSTONE, weathered to medium hard, gray to dark red brown, iron staining, moist, varies to CLAYSTONE, with sand | | | 4 | GRAB | | | | | | |
| | | | | 3 | RS | 12 | 22/12 | 14 | 104 | | +4.9/ 500PSF |
| | | 5 | | | | | | | | | |
| | | 10 | | | | | | | | | |
| | | | | 5 | RS | 11 | 50/11 | | | | |
| | | 15 | | | | | | | | | |
| | 20 4903.5 | | | 6 | RS | 11 | 50/11 | | | | |
| | Stopped boring at 20 feet | 20 | | | | | | | | | |

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

| WATER LEVEL OBSERVATIONS, ft | | |
|---|---|---|
| WL | NONE WD | NONE 10/16/02 |
| WL | | |
| WL | | |

Terracon

| | | | |
|---|---|---|---|
| BORING STARTED | 10-10-02 | | |
| BORING COMPLETED | 10-10-02 | | |
| RIG | CME 55 | FOREMAN | SF |
| APPROVED | MEA | JOB # | 25025241 |

BOREHOLE 99 25025241.GPJ TERRACON.GDT 10/29/02

# LOG OF BORING NO. 9



CLIENT: Matrix Funding Corporation

PROJECT: Proposed Multi- Family Residential Development

SITE: Fort Lupton, Colorado

PROJECT: Parcel A- Coyote Creek Subdivision

| GRAPHIC LOG | DESCRIPTION | DEPTH, ft. | USCS SYMBOL | SAMPLES NUMBER | SAMPLES TYPE | SAMPLES RECOVERY, in. | SAMPLES BLOWS / in. | TESTS WATER CONTENT, % | TESTS DRY UNIT WT pcf | TESTS UNCONFINED STRENGTH, psf | % Swell or Consol/ Surcharge Load |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Approx. Surface Elev.: 4923.5 ft | | | | | | | | | | |
| | CLAYEY SAND, fine to coarse grained, medium dense, brown, moist | | SC | 1 | GRAB | | | | | | |
| | | | SC | 2 | RS | 12 | 20/12 | 15 | 85 | | |
| | 3.5 4920 | | | | | | | | | | |
| | CLAYSTONE, weathered to firm, gray to olive brown, iron staining, moist | | | 3 | RS | 12 | 22/12 | 18 | 98 | | +4.4/ 500PSF |
| | | 5 | | 4 | GRAB | | | | | | |
| | | | | 5 | RS | 12 | 46/12 | | | | |
| | 11 4912.5 | 10 | | | | | | | | | |
| | SANDSTONE, fine grained, trace clay, medium hard to hard, weakly cemented, brown to gray, moist to wet ▼ | | | 6 | RS | 9 | 50/9 | | | | |
| | | 15 | | | | | | | | | |
| | | | | 7 | RS | 7 | 50/7 | | | | |
| | ▽ | 20 | | | | | | | | | |
| | 25 4898.5 | | | 8 | RS | 12 | 50/12 | | | | |
| | Stopped boring at 25 feet | 25 | | | | | | | | | |

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

| WATER LEVEL OBSERVATIONS, ft | | | | |
|---|---|---|---|---|
| WL | ▽ 22.5 | WD | ▼ 12 | 10/16/02 |
| WL | ▽ | | ▼ | |
| WL | | | | |

Terracon

| | | | |
|---|---|---|---|
| BORING STARTED | | | 10-10-02 |
| BORING COMPLETED | | | 10-10-02 |
| RIG | CME 55 | FOREMAN | SF |
| APPROVED | MEA | JOB # | 25025241 |

BOREHOLE 99 25025241.GPJ TERRACON.GDT 10/29/02

# LOG OF BORING NO. 10



CLIENT: Matrix Funding Corporation

PROJECT: Proposed Multi- Family Residential Development

SITE: Fort Lupton, Colorado

PROJECT: Parcel A- Coyote Creek Subdivision

Approx. Surface Elev.: 4927 ft

| DEPTH, ft. | GRAPHIC LOG | DESCRIPTION | USCS SYMBOL | SAMPLES NUMBER | SAMPLES TYPE | SAMPLES RECOVERY, in. | SAMPLES BLOWS / in. | TESTS WATER CONTENT, % | TESTS DRY UNIT WT pcf | TESTS UNCONFINED STRENGTH, psf | % Swell or Consol/ Surcharge Load |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | SANDY SILT, medium dense, light yellow brown, dry to moist | | | | | | | | | |
| | | | ML | 1 | RS | 12 | 26/12 | 7 | 99 | | |
| 4 | | 4923 | | | | | | | | | |
| | | SILTY SAND, fine to medium grained, loose, yellow brown, dry to moist | SM | 2 | RS | 12 | 14/12 | 1 | | | |
| 5 | | | | | | | | | | | |
| 8.5 | | 4918.5 | | | | | | | | | |
| | | CLAYSTONE, firm to medium hard, olive brown to dark gray, iron staining, trace lignite, moist | | 3 | RS | 12 | 34/12 | 18 | 112 | | +4.4/ 500PSF |
| 10 | | | | | | | | | | | |
| | | | | 4 | RS | 12 | 36/12 | | | | |
| 15 | | | | | | | | | | | |
| | | | | 5 | RS | 10 | 50/10 | | | | |
| 20 | | | | | | | | | | | |
| 25 | | 4902 | | | | | | | | | |
| | | Stopped boring at 25 feet | | | | | | | | | |
| 25 | | | | | | | | | | | |

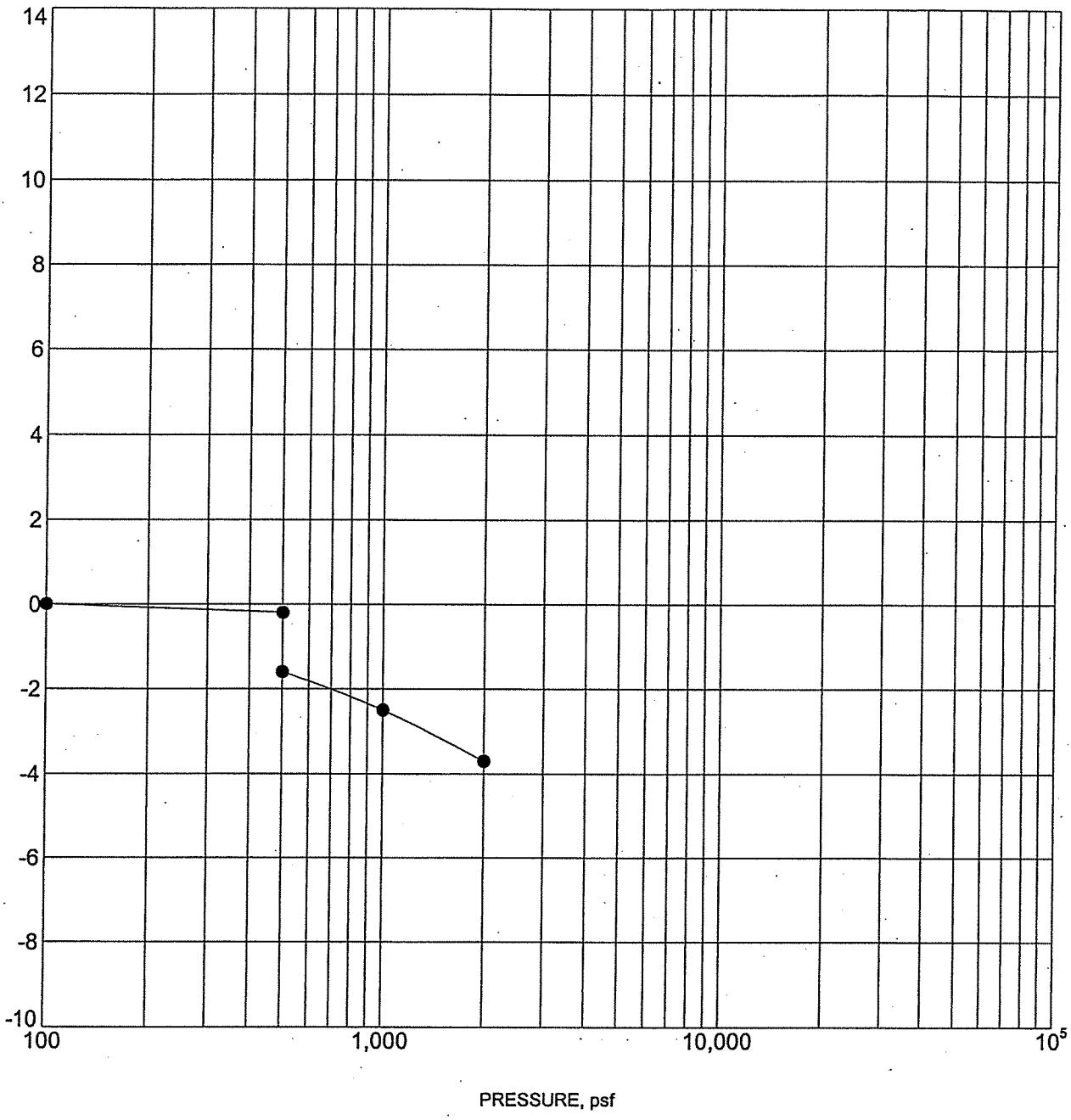
The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

| WATER LEVEL OBSERVATIONS, ft | | |
|---|---|---|
| WL | NONE WD | DCI@23'/16/02 |
| WL | | |
| WL | | |

Terracon

| | | | |
|---|---|---|---|
| BORING STARTED | 10-10-02 | | |
| BORING COMPLETED | 10-10-02 | | |
| RIG | CME 55 | FOREMAN | SF |
| APPROVED | MEA | JOB # | 25025241 |

BOREHOLE 99 25025241.GPJ TERRACON.GDT 10/29/02




| Specimen Identification | | Classification | $\gamma_d$, pcf | WC,% |
|---|---|---|---|---|
| ● 1 | 4.0ft | SILTY SAND | 101 | 9 |

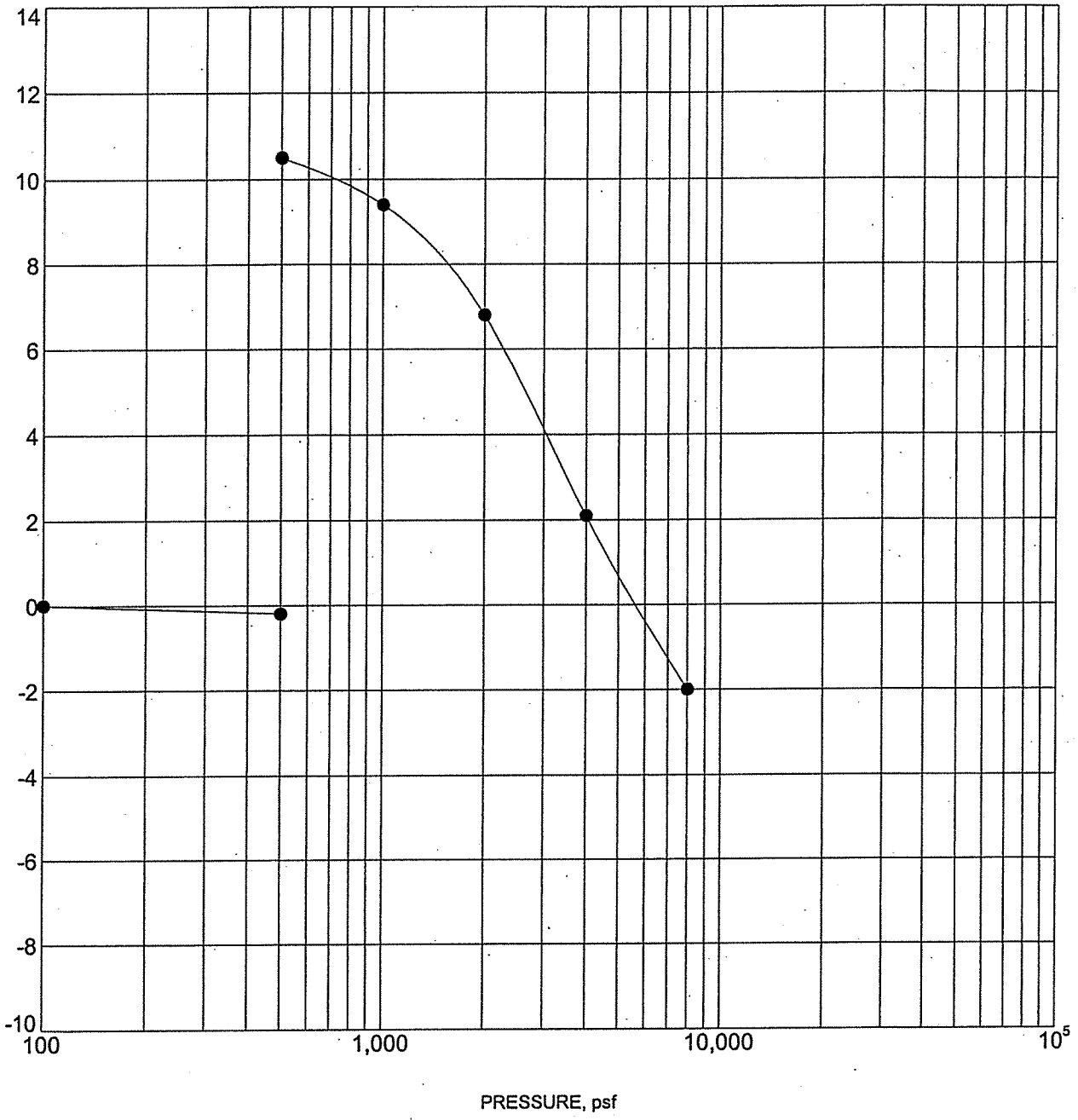
Notes:

TC CONSOL STRAIN 25025241.GPJ TERRACON.GDT 10/29/02

Terracon

## CONSOLIDATION TEST

Project: Parcel A- Coyote Creek Subdivision
Site: Fort Lupton, Colorado
Job #: 25025241
Date: 10-29-02




| Specimen Identification | | Classification | $\gamma_d$, pcf | WC,% |
|---|---|---|---|---|
| ● 2 | 9.0ft | CLAYSTONE | 117 | 14 |

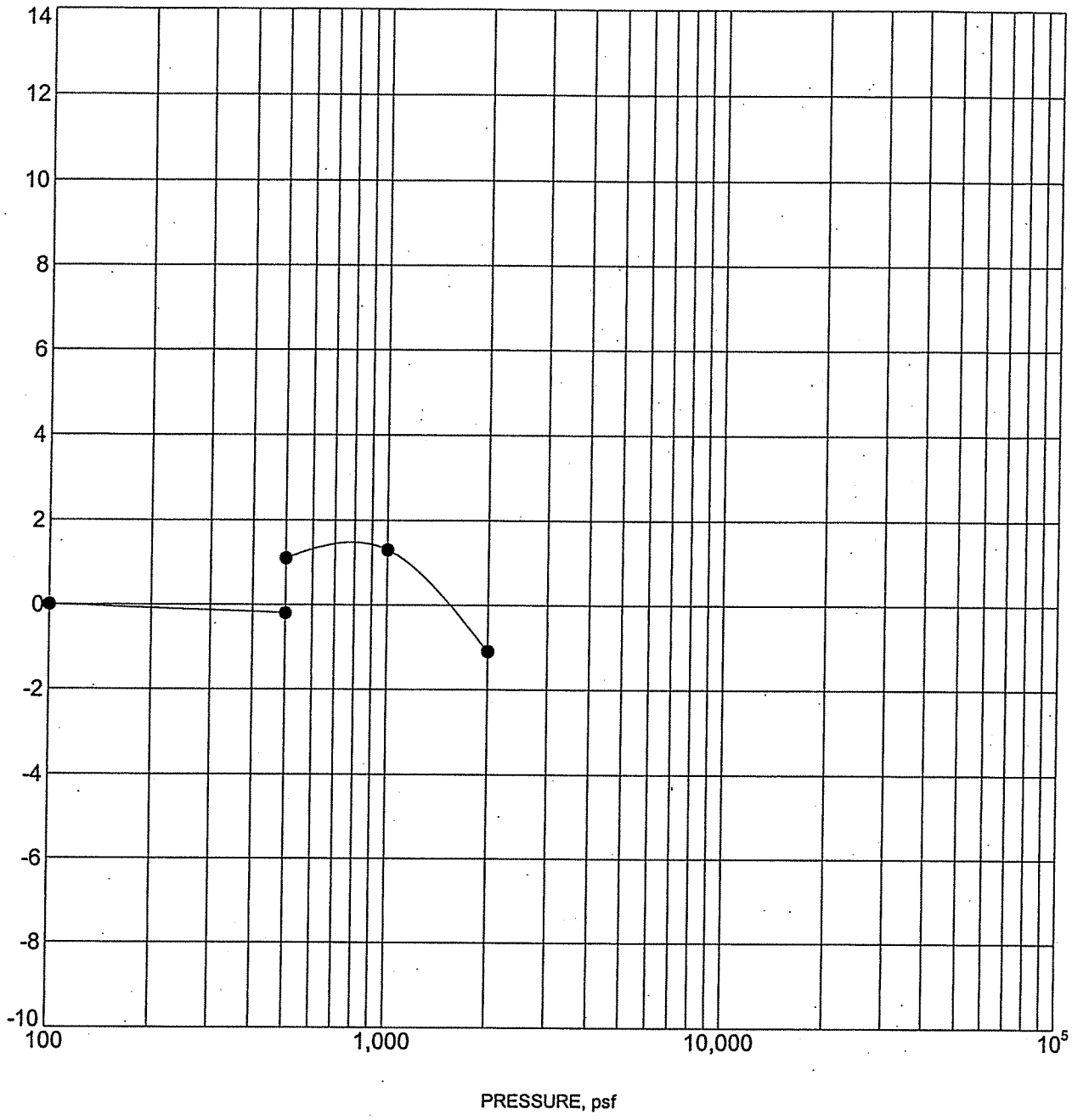
Notes:

Terracon

## CONSOLIDATION TEST

Project: Parcel A- Coyote Creek Subdivision
Site: Fort Lupton, Colorado
Job #: 25025241
Date: 10-29-02

TC CONSOL STRAIN 25025241.GPJ TERRACON.GDT 10/29/02




| Specimen Identification | | Classification | $\gamma_d$, pcf | WC,% |
|---|---|---|---|---|
| ● 3 | 4.0ft | CLAYSTONE | 108 | 11 |

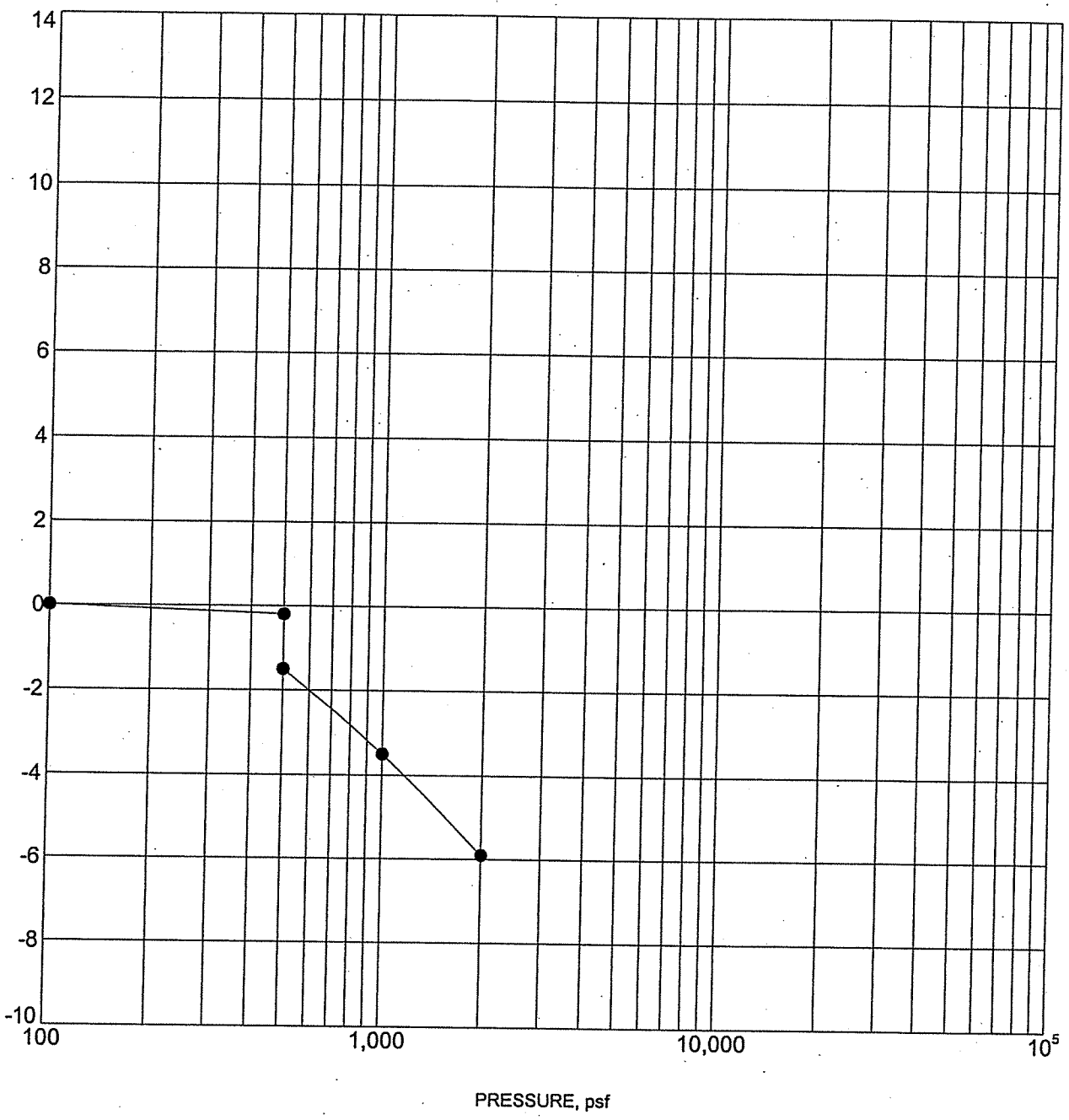
Notes:

TC CONSOL STRAIN 25025241.GPJ TERRACON.GDT 10/29/02

Terracon

## CONSOLIDATION TEST

Project: Parcel A- Coyote Creek Subdivision
Site: Fort Lupton, Colorado
Job #: 25025241
Date: 10-29-02




| Specimen Identification | | Classification | $\gamma_d$, pcf | WC,% |
|---|---|---|---|---|
| ● 4 | 2.0ft | SANDY LEAN CLAY | 108 | 6 |

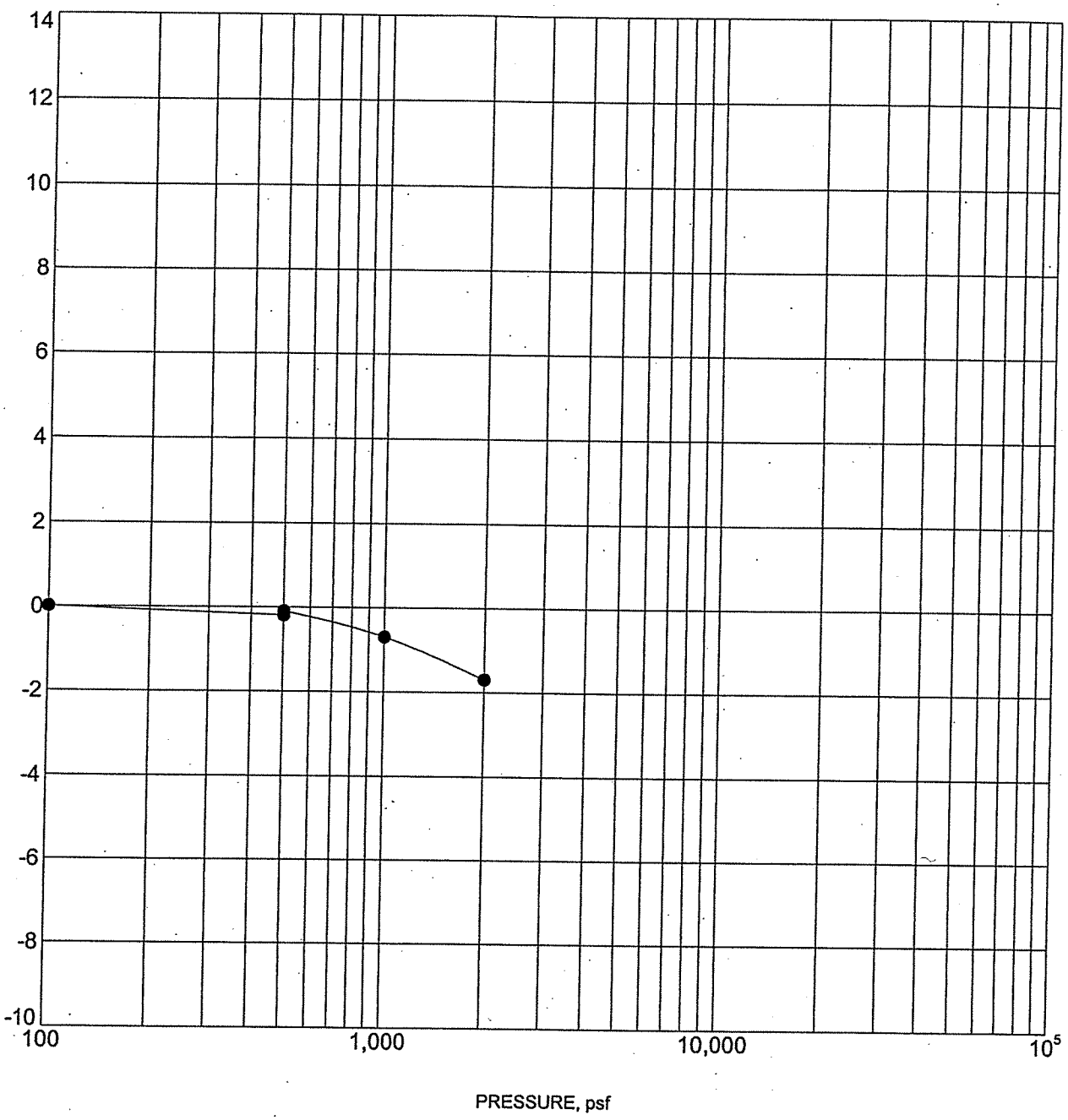
Notes: Disturbed

TC CONSOL STRAIN 25025241.GPJ TERRACON.GDT 10/29/02

Terracon

## CONSOLIDATION TEST

Project: Parcel A- Coyote Creek Subdivision
Site: Fort Lupton, Colorado
Job #: 25025241
Date: 10-29-02




| Specimen Identification | | Classification | $\gamma_d$, pcf | WC,% |
|---|---|---|---|---|
| ● 5 | 4.0ft | **CLAYSTONE** | **116** | **15** |

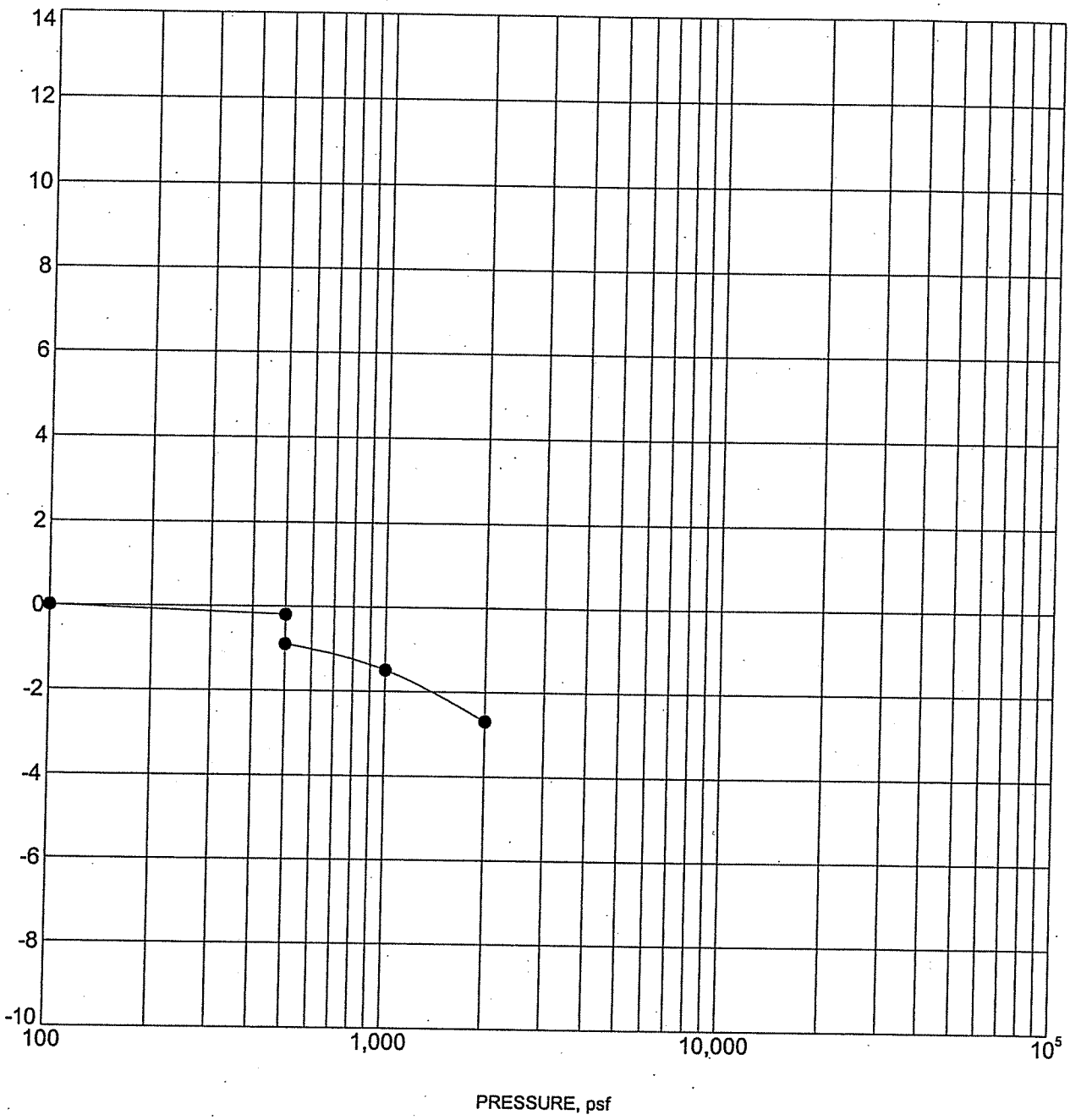
Notes:

TC CONSOL STRAIN 25025241.GPJ TERRACON.GDT 10/29/02

Terracon

## CONSOLIDATION TEST

Project: Parcel A- Coyote Creek Subdivision
Site: Fort Lupton, Colorado
Job #: 25025241
Date: 10-29-02




| Specimen Identification | | Classification | $\gamma_d$, pcf | WC,% |
|---|---|---|---|---|
| ● 6 | 2.0ft | SILTY SAND | 112 | 9 |

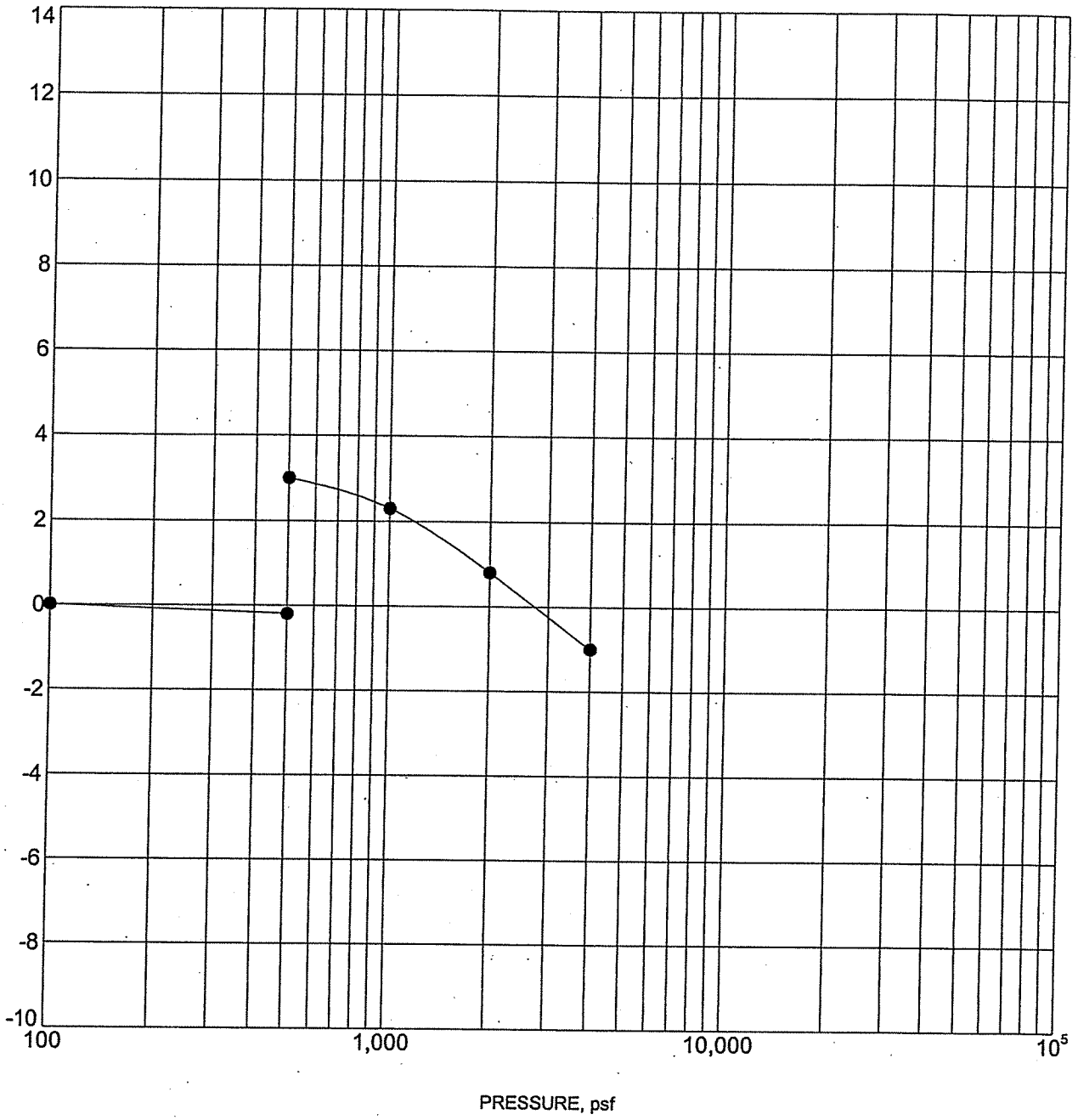
Notes:

TC CONSOL STRAIN 25025241.GPJ TERRACON.GDT 10/29/02

Terracon

## CONSOLIDATION TEST

Project: Parcel A- Coyote Creek Subdivision
Site: Fort Lupton, Colorado
Job #: 25025241
Date: 10-29-02




| Specimen Identification | | Classification | $\gamma_d$, pcf | WC,% |
|---|---|---|---|---|
| ● 7 | 9.0ft | CLAYSTONE | 116 | 16 |

Notes:

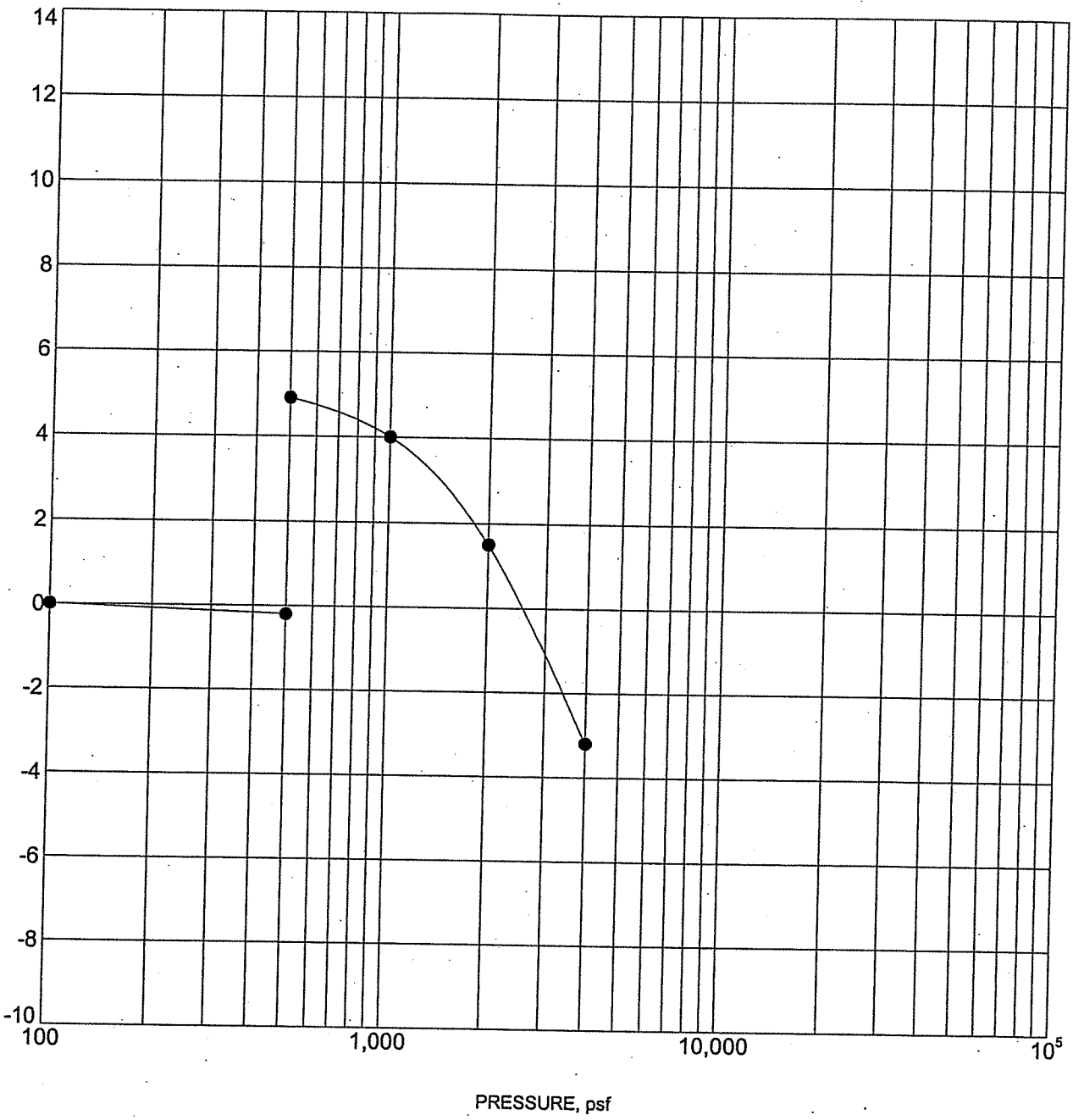
Terracon

## CONSOLIDATION TEST

Project: Parcel A- Coyote Creek Subdivision
Site: Fort Lupton, Colorado
Job #: 25025241
Date: 10-29-02



TC CONSOL STRAIN 25025241.GPJ TERRACON.GDT 10/29/02




| Specimen Identification | | Classification | $\gamma_d$, pcf | WC,% |
|---|---|---|---|---|
| ● 8 | 4.0ft | CLAYSTONE | 104 | 14 |

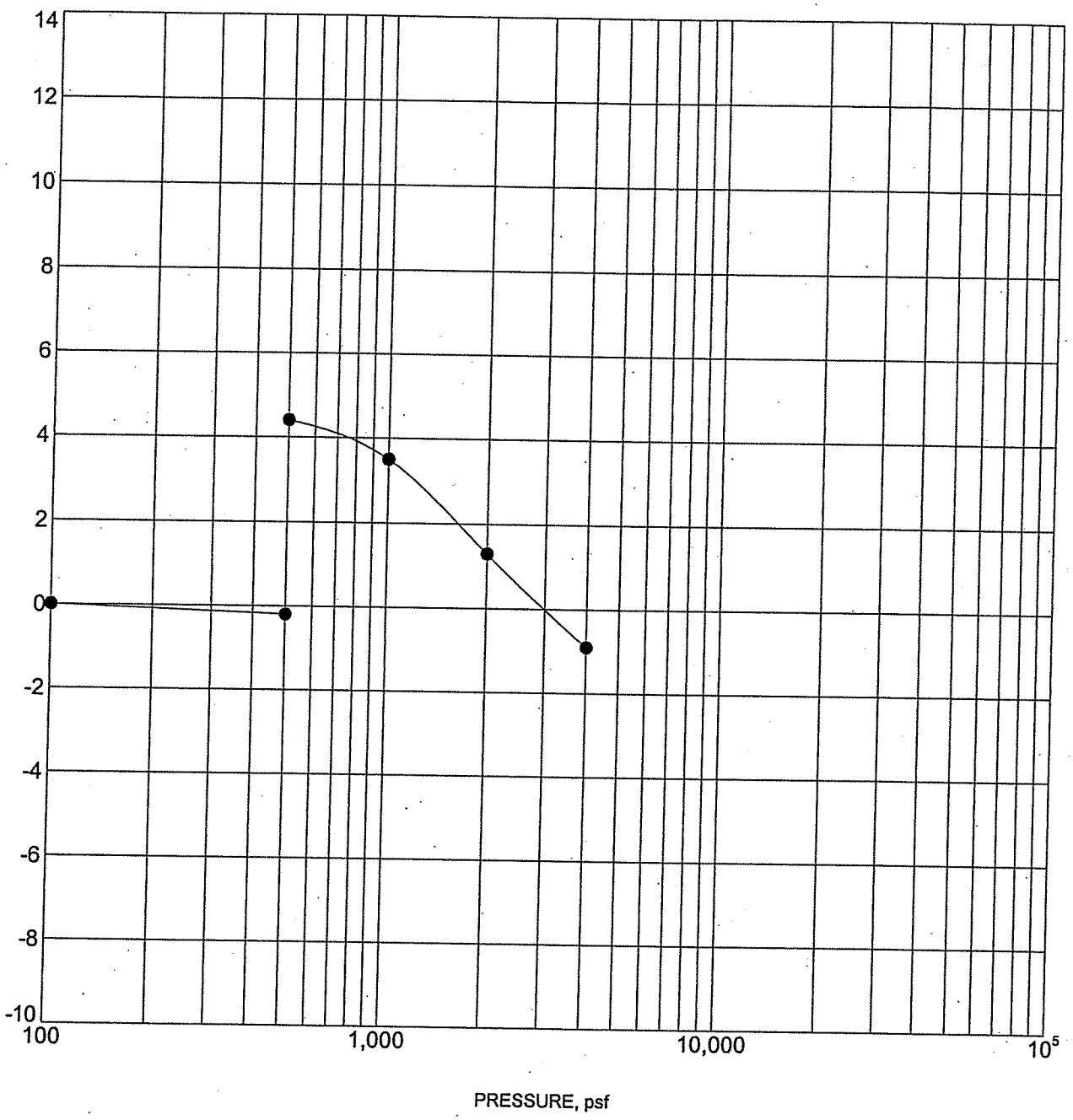
Notes:

TC_CONSOL_STRAIN 25025241.GPJ TERRACON.GDT 10/29/02

Terracon

## CONSOLIDATION TEST

Project: Parcel A- Coyote Creek Subdivision
Site: Fort Lupton, Colorado
Job #: 25025241
Date: 10-29-02




| Specimen Identification | | Classification | $\gamma_d$, pcf | WC,% |
|---|---|---|---|---|
| ● 9 | 4.0ft | CLAYSTONE | 98 | 18 |

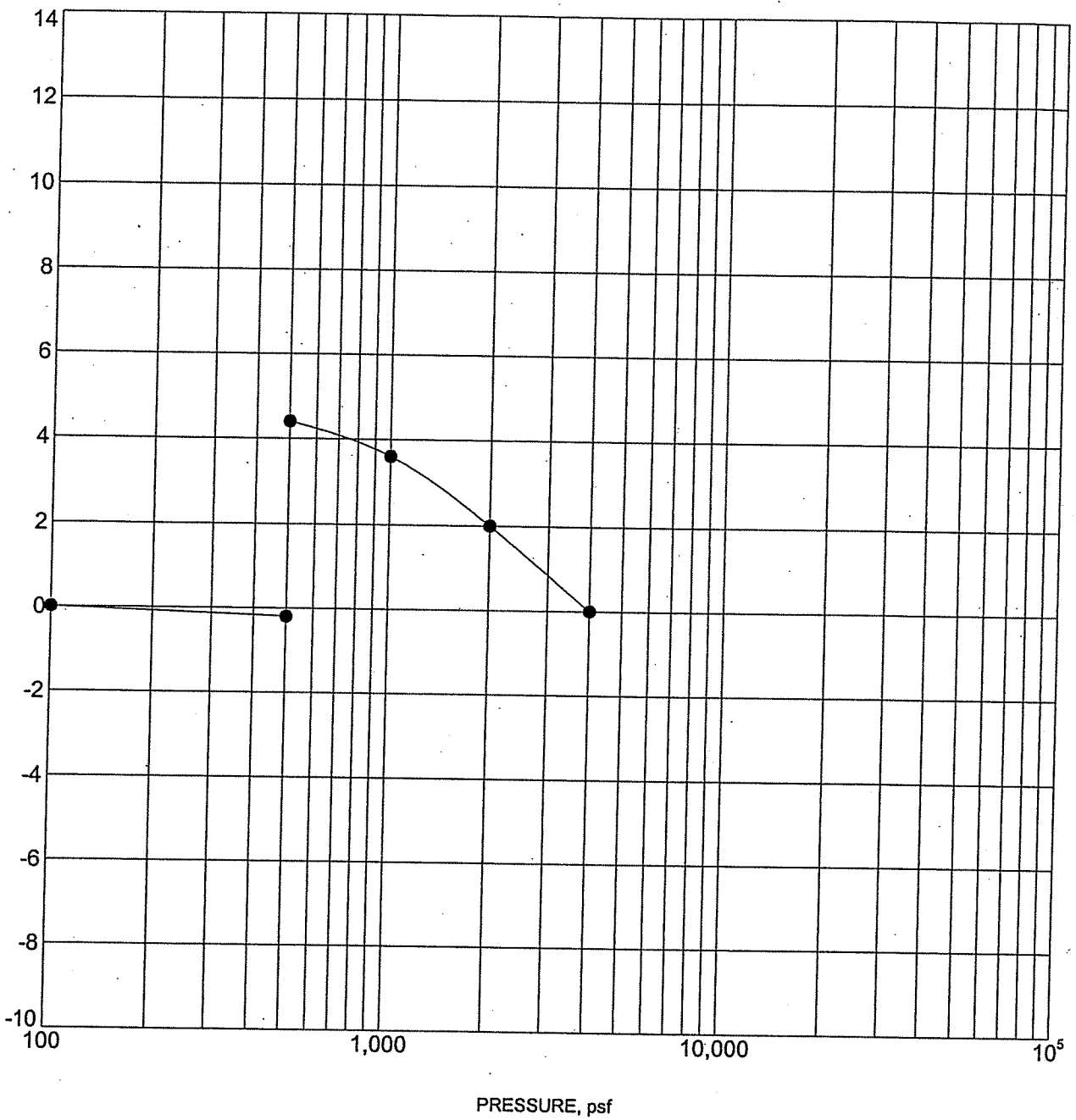
Notes:

TC CONSOL STRAIN 25025241.GPJ TERRACON.GDT 10/29/02

Terracon

## CONSOLIDATION TEST

Project: Parcel A- Coyote Creek Subdivision
Site: Fort Lupton, Colorado
Job #: 25025241
Date: 10-29-02




| Specimen Identification | | Classification | $\gamma_d$, pcf | WC,% |
|---|---|---|---|---|
| ● 10 | 9.0ft | CLAYSTONE | 112 | 18 |

Notes:

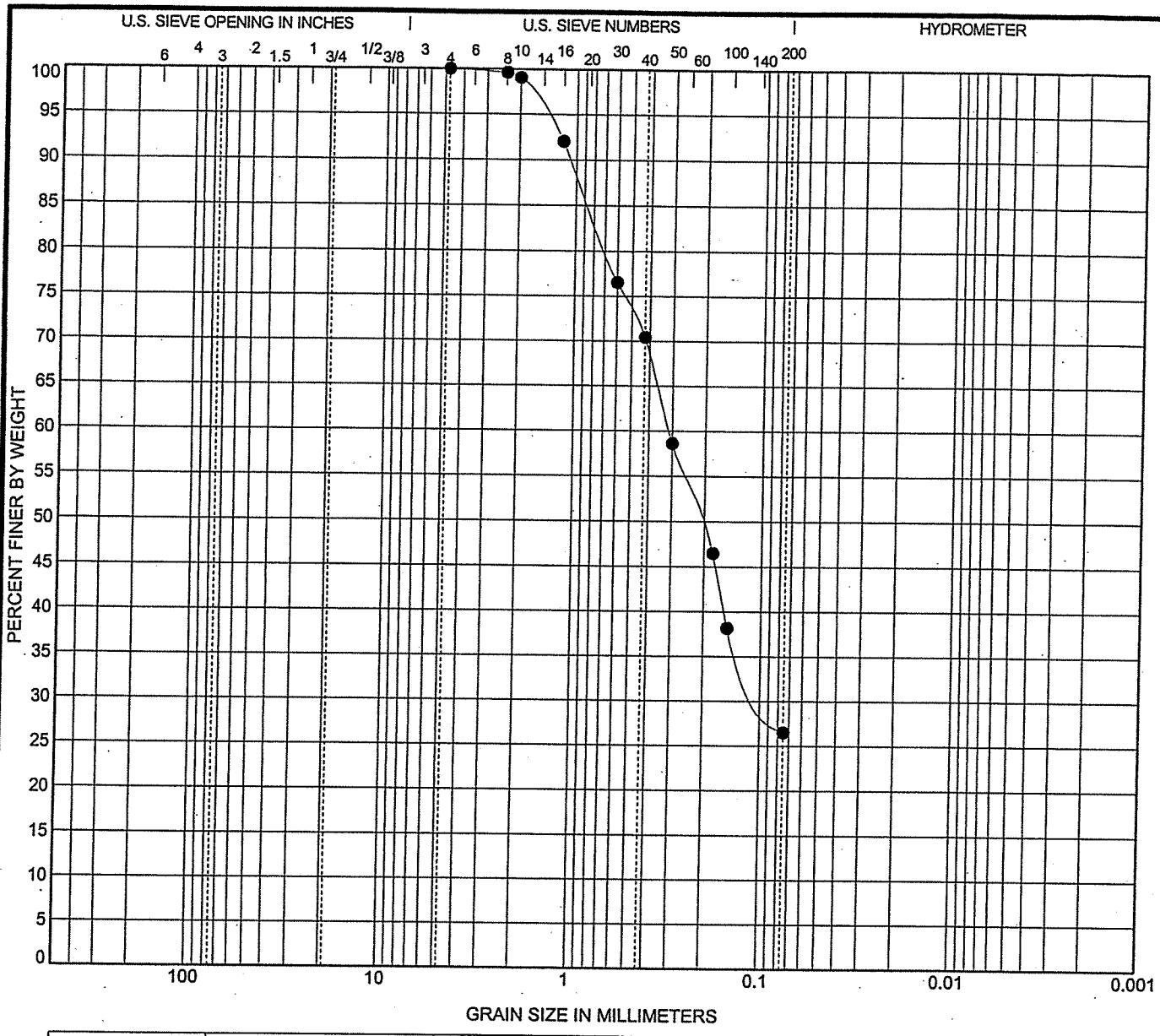
Terracon

## CONSOLIDATION TEST

Project: Parcel A- Coyote Creek Subdivision
Site: Fort Lupton, Colorado
Job #: 25025241
Date: 10-29-02



TC CONSOL STRAIN 25025241.GPJ TERRACON.GDT 10/29/02




| COBBLES | GRAVEL | | SAND | | | SILT OR CLAY |
|---|---|---|---|---|---|---|
| | coarse | fine | coarse | medium | fine | |

| Specimen Identification | | Classification | LL | PL | PI | Cc | Cu |
|---|---|---|---|---|---|---|---|
| ● 1 | 2.0ft | SILTY SAND(SM) | NP | NP | NP | | |

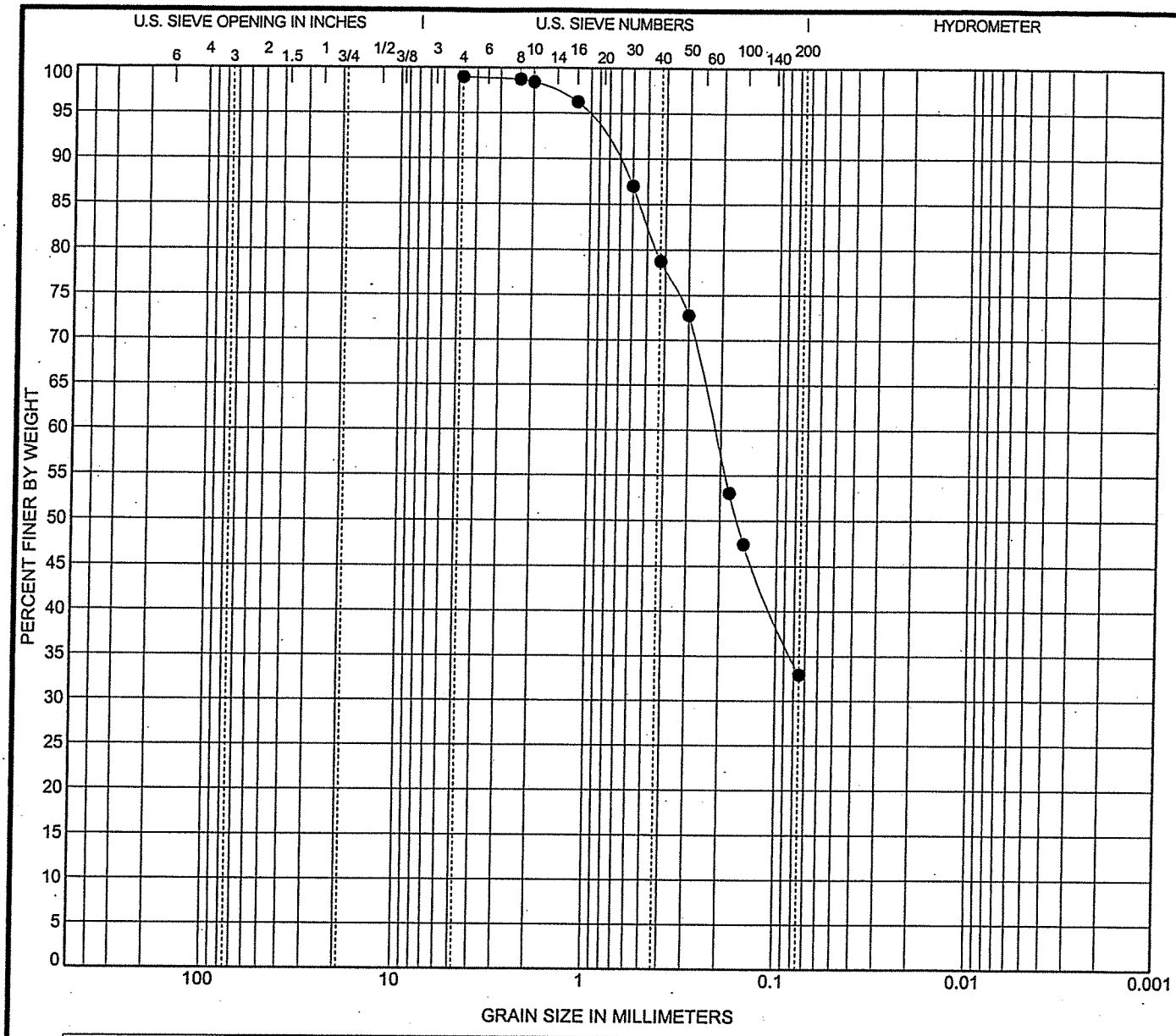
| Specimen Identification | | D100 | D60 | D30 | D10 | %Gravel | %Sand | %Silt | %Clay |
|---|---|---|---|---|---|---|---|---|---|
| ● 1 | 2.0ft | 4.75 | 0.313 | 0.092 | | 0.0 | 73.5 | 26.5 | |

Terracon

# GRAIN SIZE DISTRIBUTION

Project: Parcel A- Coyote Creek Subdivision
Site: Fort Lupton, Colorado
Job #: 25025241
Date: 10-29-02

TC GRAIN SIZE 25025241.GPJ TERRACON.GDT 10/29/02




| COBBLES | GRAVEL | | SAND | | | SILT OR CLAY |
|---|---|---|---|---|---|---|
| | coarse | fine | coarse | medium | fine | |

| | Specimen Identification | Classification | LL | PL | PI | Cc | Cu |
|---|---|---|---|---|---|---|---|
| ● | 7 0.0ft | SILTY SAND(SM) | NP | NP | NP | | |

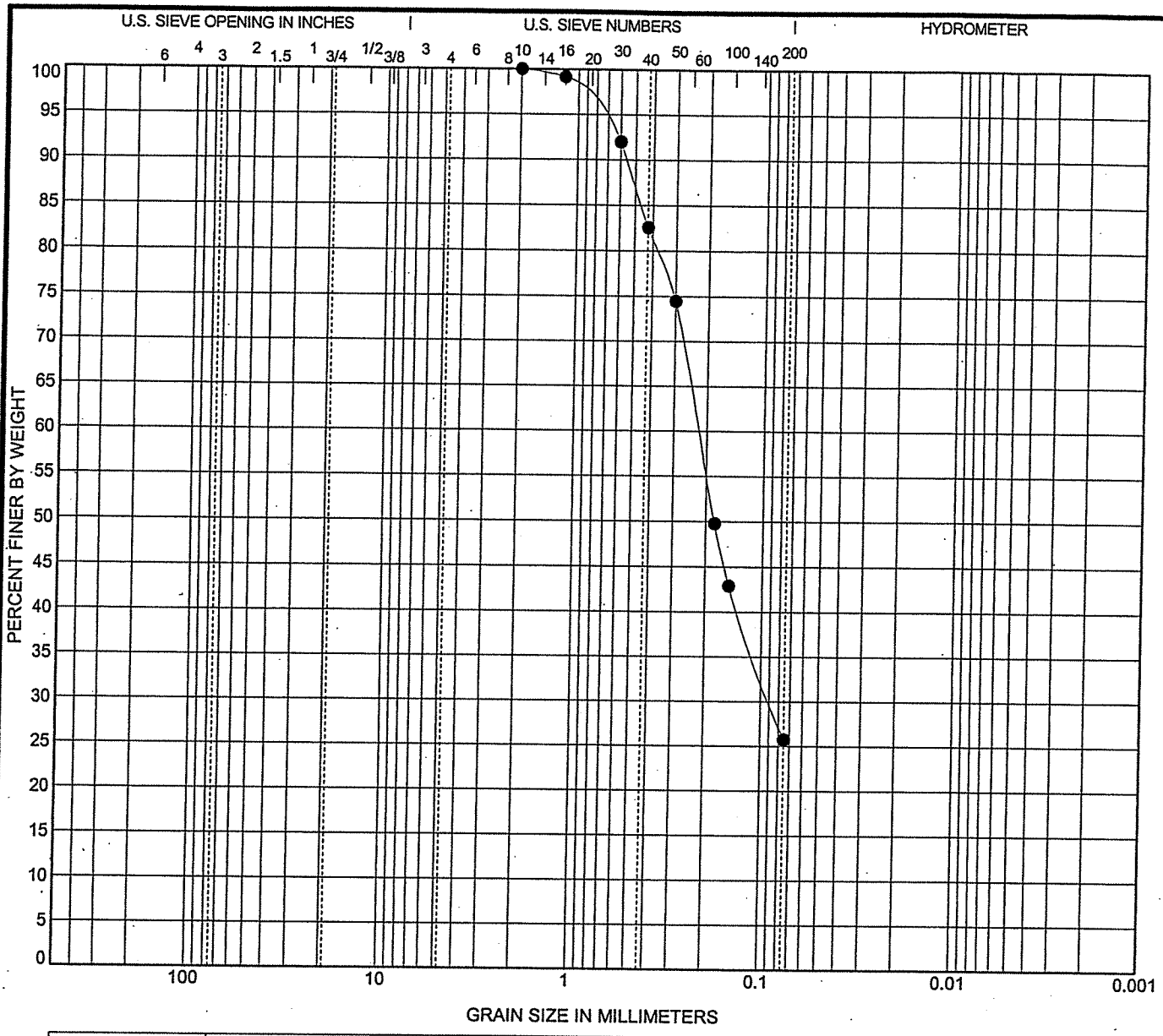
| | Specimen Identification | D100 | D60 | D30 | D10 | %Gravel | %Sand | %Silt | %Clay |
|---|---|---|---|---|---|---|---|---|---|
| ● | 7 0.0ft | 4.75 | 0.216 | | | 0.0 | 66.0 | 32.9 | |

TC GRAIN SIZE 25025241.GPJ TERRACON.GDT 10/29/02

Terracon

## GRAIN SIZE DISTRIBUTION

Project: Parcel A- Coyote Creek Subdivision
Site: Fort Lupton, Colorado
Job #: 25025241
Date: 10-29-02




| COBBLES | GRAVEL | | SAND | | | SILT OR CLAY |
|---|---|---|---|---|---|---|
| | coarse | fine | coarse | medium | fine | |

| | Specimen Identification | Classification | LL | PL | PI | Cc | Cu |
|---|---|---|---|---|---|---|---|
| ● | 7 4.0ft | SILTY SAND(SM) | NP | NP | NP | | |

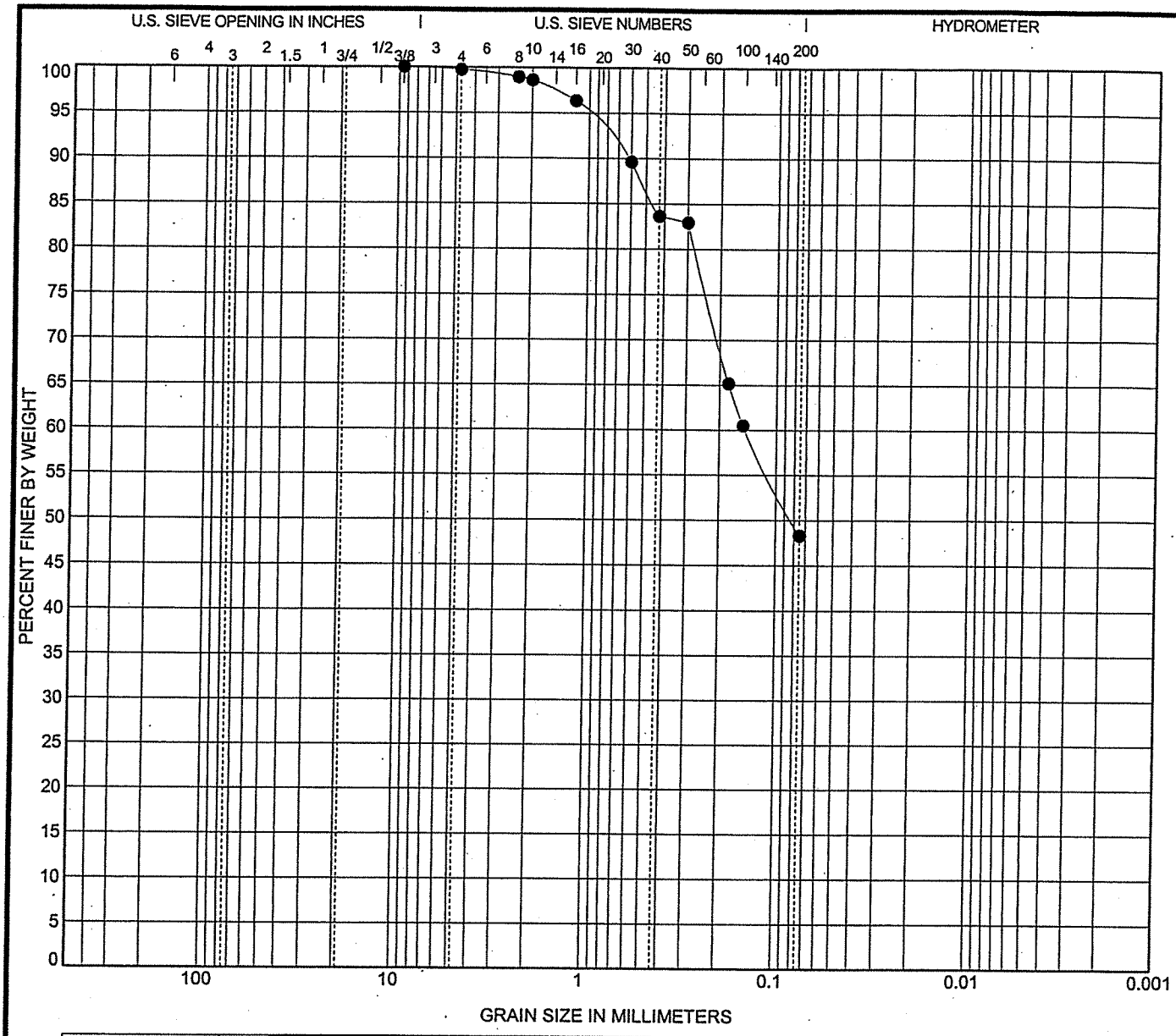
| | Specimen Identification | D100 | D60 | D30 | D10 | %Gravel | %Sand | %Silt | %Clay |
|---|---|---|---|---|---|---|---|---|---|
| ● | 7 4.0ft | 2 | 0.222 | 0.089 | | 0.0 | 74.3 | 25.7 | |

Terracon

# GRAIN SIZE DISTRIBUTION

Project: Parcel A- Coyote Creek Subdivision
Site: Fort Lupton, Colorado
Job #: 25025241
Date: 10-29-02

TC GRAIN SIZE 25025241.GPJ TERRACON.GDT 10/29/02




| COBBLES | GRAVEL | | SAND | | | SILT OR CLAY |
|---|---|---|---|---|---|---|
| | coarse | fine | coarse | medium | fine | |

| | Specimen Identification | Classification | LL | PL | PI | Cc | Cu |
|---|---|---|---|---|---|---|---|
| ● | 9 0.0ft | **CLAYEY SAND(SC)** | **23** | **13** | **10** | | |

| | Specimen Identification | D100 | D60 | D30 | D10 | %Gravel | %Sand | %Silt | %Clay |
|---|---|---|---|---|---|---|---|---|---|
| ● | 9 0.0ft | **9.5** | **0.146** | | | **0.3** | **51.5** | **48.3** | |

Terracon

# GRAIN SIZE DISTRIBUTION

Project: Parcel A- Coyote Creek Subdivision
Site: Fort Lupton, Colorado
Job #: 25025241
Date: 10-29-02



TC GRAIN SIZE 25025241.GPJ TERRACON.GDT 10/29/02

# SOIL PROPERTIES

## PARCEL A – COYOTE CREEK SUBDIVISION – FORT LUPTON, COLORADO

## TERRACON Project No. 25025241

| Boring No. | Depth (ft) | Soil Class. | Soil Property | | Atterberg Limits | | Expansion/Consolidation | | | Shear Strength | | Corrected R-Value | Water Soluble Matter, (mg/l) | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Initial Dry Density (pcf) | Initial Water Content (%) | LL | PI | Surcharge KSF | Expansion (%) | Max. Swell Pressure KSF | C KSF | ϕ Deg | | Salts | Sulfates | |
| 1 | 2 | SM | 105 | 4 | | | | | | | | | | | 4,5 |
| 1 | 4 | SM | 101 | 9 | | | 0.5 | -1.6 | | | | | | | 3,4,5 |
| 2 | 2 | SM | 102 | 2 | | | | | | | | | | | 4,5 |
| 2 | 4 | | 112 | 2 | | | | | | | | | | | 4 |
| 2 | 9 | | 117 | 14 | | | 0.5 | +10.5 | | | | | | | 3,4 |
| 3 | 2 | CL | 102 | 10 | | | | | | | | | | | 4,5 |
| 3 | 4 | | 108 | 11 | | | 0.5 | +2.1 | | | | | | | 3,4 |
| 3 | 9 | | -- | -- | | | | | | | | | | 18 | -- |
| 4 | 2 | CL | 108 | 6 | | | | | | | | | | | 4,5 |
| 4 | 4 | SC | 112 | 6 | | | | | | | | | | | 4,5 |
| 4 | 9 | | 117 | 15 | | | | | | | | | | | 4 |
| 5 | 2 | SM | 117 | 11 | | | | | | | | | | 0 | 4,5 |

* = Partially disturbed sample
- = Compression/settlement
**Note:** Initial Dry Density and Initial Water Content are in-situ values unless otherwise Noted.

**Legend**

Shear Strength Test Method
DS - Direct Shear
DS - Direct Shear (Saturated)
UC - Unconfined Compression
UU - Unconsolidated Undrained
CU - Consolidated Undrained w/pore pressure
CU - Consolidated Undrained
CD - Consolidated Drained

**REMARKS**

1. Compacted density (approximately 95% of ASTM D698 maximum density at moisture content slightly below optimum).
2. Compacted density (approximately 95% of ASTM D1557 maximum density at moisture content slightly below optimum).
3. Submerged to approximate saturation.
4. Dry density determined from one ring of a multi-ring sample.
5. Visual Classification.

Terracon

# SOIL PROPERTIES

## PARCEL A – COYOTE CREEK SUBDIVISION – FORT LUPTON, COLORADO

## TERRACON Project No. 25025241

| Boring No. | Depth (ft) | Soil Class. | Soil Property | | Atterberg Limits | | Expansion/Consolidation | | | Shear Strength | | Corrected R-Value | Water Soluble Matter, (mg/l) | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Initial Dry Density (pcf) | Initial Water Content (%) | LL | PI | Surcharge KSF | Expansion (%) | Max. Swell Pressure KSF | C KSF | ϕ Deg | | Salts | Sulfates | |
| 5 | 4 | | 116 | 15 | | | | | | | | | | | 4 |
| 6 | 2 | SM | 112 | 9 | | | 0.5 | -0.6 | | | | | | | 3,4,5 |
| 6 | 4 | | 104 | 11 | | | | | | | | | | | 4 |
| 6 | 9 | | 103 | 22 | | | | | | | | | | | 4 |
| 7 | 2 | SM | 102 | 4 | | | | | | | | | | | 4,5 |
| 7 | 4 | SM | 108 | 3 | | | | | | | | | | | 4,5 |
| 7 | 9 | | 116 | 16 | | | 0.5 | +3.0 | | | | | | | 3,4 |
| 8 | 2 | CL | 89 | 14 | | | | | | | | | | | 4,5 |
| 8 | 4 | | 104 | 14 | | | 0.5 | +4.9 | | | | | | | 3,4 |
| 9 | 2 | SC | 85 | 15 | | | | | | | | | | 410 | 4,5 |
| 9 | 4 | | 98 | 18 | | | 0.5 | +4.4 | | | | | | | 3,4 |
| 10 | 2 | ML | 99 | 7 | | | | | | | | | | | 4,5 |

* = Partially disturbed sample
\- = Compression/settlement
**Note:** Initial Dry Density and Initial Water Content are in-situ values unless otherwise Noted.

**Legend**

Shear Strength Test Method
DS - Direct Shear
DS - Direct Shear (Saturated)
UC - Unconfined Compression
UU - Unconsolidated Undrained
CU - Consolidated Undrained w/pore pressure
CU - Consolidated Undrained
CD - Consolidated Drained

**REMARKS**

1. Compacted density (approximately 95% of ASTM D698 maximum density at moisture content slightly below optimum).
2. Compacted density (approximately 95% of ASTM D1557 maximum density at moisture content slightly below optimum).
3. Submerged to approximate saturation.
4. Dry density determined from one ring of a multi-ring sample.
5. Visual Classification.

Terracon

# SOIL PROPERTIES

## PARCEL A – COYOTE CREEK SUBDIVISION – FORT LUPTON, COLORADO

## TERRACON Project No. 25025241

| Boring No. | Depth (ft) | Soil Class. | Soil Property | | Atterberg Limits | | Expansion/Consolidation | | | Shear Strength | | Corrected R-Value | Water Soluble Matter, (mg/l) | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Initial Dry Density (pcf) | Initial Water Content (%) | LL | PI | Surcharge KSF | Expansion (%) | Max. Swell Pressure KSF | C KSF | ϕ Deg | | Salts | Sulfates | |
| 10 | 4 | SM | -- | 1.0 | | | | | | | | | | | 5 |
| 10 | 9 | | 112 | 18 | | | 0.5 | +4.4 | | | | | | | 3,4 |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |

* = Partially disturbed sample
- = Compression/settlement
**Note:** Initial Dry Density and Initial Water Content are in-situ values unless otherwise Noted.

**Legend**

Shear Strength Test Method
DS - Direct Shear
DS - Direct Shear (Saturated)
UC - Unconfined Compression
UU - Unconsolidated Undrained
CU - Consolidated Undrained w/pore pressure
CU - Consolidated Undrained
CD - Consolidated Drained

**REMARKS**

1. Compacted density (approximately 95% of ASTM D698 maximum density at moisture content slightly below optimum).
2. Compacted density (approximately 95% of ASTM D1557 maximum density at moisture content slightly below optimum).
3. Submerged to approximate saturation.
4. Dry density determined from one ring of a multi-ring sample.
5. Visual Classification.

Terracon

# PHYSICAL PROPERTIES

## PARCEL A – COYOTE CREEK SUBDIVISION – FORT LUPTON, COLORADO

## TERRACON Project No. 25025241

| Boring No. | Depth (ft) | Soil Class. | Particle Size Distribution, % Passing by Weight | | | | | Atterberg Limits | | Moisture-Density Relationship | | | Specific Gravity | Permeability | | Corrected R-Value | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 3" | #4 | #10 | #40 | #200 | LL | PI | Dry Density (pcf) | Optimum Moisture (%) | Method | | Dry Density (pcf) | K Cm/Sec | | |
| 1 | 2 | A-2-4 (0) SM | | 100 | 99 | 70 | 26 | NV | NP | | | | | | | | 2 |
| 2 | 9 | A-7-6 (33) CH | | | | | 88 | 51 | 36 | | | | | | | | 3 |
| 3 | 2 | A-6 (11) CL | | | | | 63 | 36 | 22 | | | | | | | | 3 |
| 7 | 0-7 | A-2-4 (0) SM | 100 | 99 | 98 | 79 | 33 | NV | NP | | | | | | | | 2 |
| 7 | 4 | A-2-4 (0) SM | | | 100 | 83 | 26 | NV | NP | | | | | | | | 2 |
| 7 | 9 | A-7-6 (25) CL | | | | | 89 | 43 | 28 | | | | | | | | 3 |
| 8 | 0-3-1/2 | A-4 (1) CL | | | | | 53 | 22 | 8 | | | | | | | | 3 |
| 9 | 0-4 | A-6 (2) SC | | 100 | 99 | 84 | 48 | 24 | 11 | | | | | | | | 2 |
| 10 | 2 | A-4 (0) ML | | | | | 54 | NV | NP | | | | | | | | 3 |
| 10 | 4 | A-2-4 (0) SM | | | 100 | 99 | 19 | NV | NP | | | | | | | | 2 |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |

**REMARKS:**

**Classification/Particle Size**
1. Visual
2. Laboratory Tested
3. Minus #200 Only

**Note:** NP = non-plastic

**Moisture-Density Relationship**
4. Tested ASTM D698/AASHTO T99
5. Tested ASTM D1577/AASHTO T180

**Specific Gravity**
6. Minus #4
7. Plus #4

**Permeability**
8. Constant Head
9. Falling Head

**R-Value**
10. Expansion Pressure ____ psf
11. Exudation Pressure 300 psi



Terracon

# GENERAL NOTES

**DRILLING & SAMPLING SYMBOLS:**

| | | | |
|---|---|---|---|
| SS: | Split Spoon - 1-3/8" I.D., 2" O.D., unless otherwise noted | HS: | Hollow Stem Auger |
| ST: | Thin-Walled Tube - 2" O.D., unless otherwise noted | PA: | Power Auger |
| RS: | Ring Sampler - 2.42" I.D., 3" O.D., unless otherwise noted | HA: | Hand Auger |
| DB: | Diamond Bit Coring - 4", N, B | RB: | Rock Bit |
| BS: | Bulk Sample or Auger Sample | WB: | Wash Boring or Mud Rotary |

The number of blows required to advance a standard 2-inch O.D. split-spoon sampler (SS) the last 12 inches of the total 18-inch penetration with a 140-pound hammer falling 30 inches is considered the "Standard Penetration" or "N-value". For 3" O.D. ring samplers (RS) the penetration value is reported as the number of blows required to advance the sampler 12 inches using a 140-pound hammer falling 30 inches, reported as "blows per foot," and is not considered equivalent to the "Standard Penetration" or "N-value".

**WATER LEVEL MEASUREMENT SYMBOLS:**

| | | | |
|---|---|---|---|
| WL: | Water Level | WS: | While Sampling |
| WCI: | Wet Cave in | WD: | While Drilling |
| DCI: | Dry Cave in | BCR: | Before Casing Removal |
| AB: | After Boring | ACR: | After Casing Removal |

Water levels indicated on the boring logs are the levels measured in the borings at the times indicated. Groundwater levels at other times and other locations across the site could vary. In pervious soils, the indicated levels may reflect the location of groundwater. In low permeability soils, the accurate determination of groundwater levels may not be possible with only short-term observations.

**DESCRIPTIVE SOIL CLASSIFICATION:** Soil classification is based on the Unified Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are principally described as clays if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

| FINE-GRAINED SOILS | | | COARSE-GRAINED SOILS | | | BEDROCK | | |
|---|---|---|---|---|---|---|---|---|
| (RS) Blows/Ft. | (SS) Blows/Ft. | Consistency | (RS) Blows/Ft. | (SS) Blows/Ft. | Relative Density | (RS) Blows/Ft. | (SS) Blows/Ft. | Consistency |
| < 3 | < 2 | Very Soft | 0-6 | < 3 | Very Loose | < 30 | < 20 | Weathered |
| 3-4 | 2-3 | Soft | 7-18 | 4-9 | Loose | 30-49 | 20-29 | Firm |
| 5-9 | 4-6 | Medium Stiff | 19-58 | 10-29 | Medium Dense | 50-89 | 30-49 | Medium Hard |
| 10-18 | 7-12 | Stiff | 59-98 | 30-49 | Dense | 90-119 | 50-79 | Hard |
| 19-42 | 13-26 | Very Stiff | > 98 | > 49 | Very Dense | > 119 | > 79 | Very Hard |
| > 42 | > 26 | Hard | | | | | | |

**RELATIVE PROPORTIONS OF SAND AND GRAVEL**

| Descriptive Terms of Other Constituents | Percent of Dry Weight |
|---|---|
| Trace | < 15 |
| With | 15 – 29 |
| Modifier | > 30 |

**GRAIN SIZE TERMINOLOGY**

| Major Component of Sample | Particle Size |
|---|---|
| Boulders | Over 12 in. (300mm) |
| Cobbles | 12 in. to 3 in. (300mm to 75 mm) |
| Gravel | 3 in. to #4 sieve (75mm to 4.75 mm) |
| Sand | #4 to #200 sieve (4.75mm to 0.075mm) |
| Silt or Clay | Passing #200 Sieve (0.075mm) |

**RELATIVE PROPORTIONS OF FINES**

| Descriptive Terms of Other Constituents | Percent of Dry Weight |
|---|---|
| Trace | < 5 |
| With | 5 – 12 |
| Modifiers | > 12 |

**PLASTICITY DESCRIPTION**

| Term | Plasticity Index |
|---|---|
| Non-plastic | 0 |
| Low | 1-10 |
| Medium | 11-30 |
| High | 30+ |

Terracon

# UNIFIED SOIL CLASSIFICATION SYSTEM

| Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests[A] | | | | | Soil Classification | |
|---|---|---|---|---|---|---|
| | | | | | Group Symbol | Group Name[B] |
| Coarse Grained Soils More than 50% retained on No. 200 sieve | Gravels More than 50% of coarse fraction retained on No. 4 sieve | Clean Gravels Less than 5% fines[C] | $Cu \geq 4$ and $1 \leq Cc \leq 3$[E] | | GW | Well graded gravel[F] |
| | | | $Cu < 4$ and/or $1 > Cc > 3$[E] | | GP | Poorly graded gravel[F] |
| | | Gravels with Fines More than 12% fines[C] | Fines classify as ML or MH | | GM | Silty gravel[F,G,H] |
| | | | Fines classify as CL or CH | | GC | Clayey gravel[F,G,H] |
| | Sands 50% or more of coarse fraction passes No. 4 sieve | Clean Sands Less than 5% fines[D] | $Cu \geq 6$ and $1 \leq Cc \leq 3$[E] | | SW | Well graded sand[I] |
| | | | $Cu < 6$ and/or $1 > Cc > 3$[E] | | SP | Poorly graded sand[I] |
| | | Sands with Fines More than 12% fines[D] | Fines classify as ML or MH | | SM | Silty sand[G,H,I] |
| | | | Fines classify as CL or CH | | SC | Clayey sand[G,H,I] |
| Fine-Grained Soils 50% or more passes the No. 200 sieve | Silts and Clays Liquid limit less than 50 | inorganic | PI > 7 and plots on or above "A" line[J] | | CL | Lean clay[K,L,M] |
| | | | PI < 4 or plots below "A" line[J] | | ML | Silt[K,L,M] |
| | | organic | Liquid limit - oven dried / Liquid limit - not dried | < 0.75 | OL | Organic clay[K,L,M,N] / Organic silt[K,L,M,O] |
| | Silts and Clays Liquid limit 50 or more | inorganic | PI plots on or above "A" line | | CH | Fat clay[K,L,M] |
| | | | PI plots below "A" line | | MH | Elastic silt[K,L,M] |
| | | organic | Liquid limit - oven dried / Liquid limit - not dried | < 0.75 | OH | Organic clay[K,L,M,P] / Organic silt[K,L,M,Q] |
| Highly organic soils | Primarily organic matter, dark in color, and organic odor | | | | PT | Peat |

[A] Based on the material passing the 3-in. (75-mm) sieve

[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well graded gravel with silt, GW-GC well graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

[D] Sands with 5 to 12% fines require dual symbols: SW-SM well graded sand with silt, SW-SC well graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay

[E] $Cu = D_{60}/D_{10}$ $\quad Cc = \dfrac{(D_{30})^2}{D_{10} \times D_{60}}$

[F] If soil contains ≥ 15% sand, add "with sand" to group name.

[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

[H] If fines are organic, add "with organic fines" to group name.

[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.

[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.

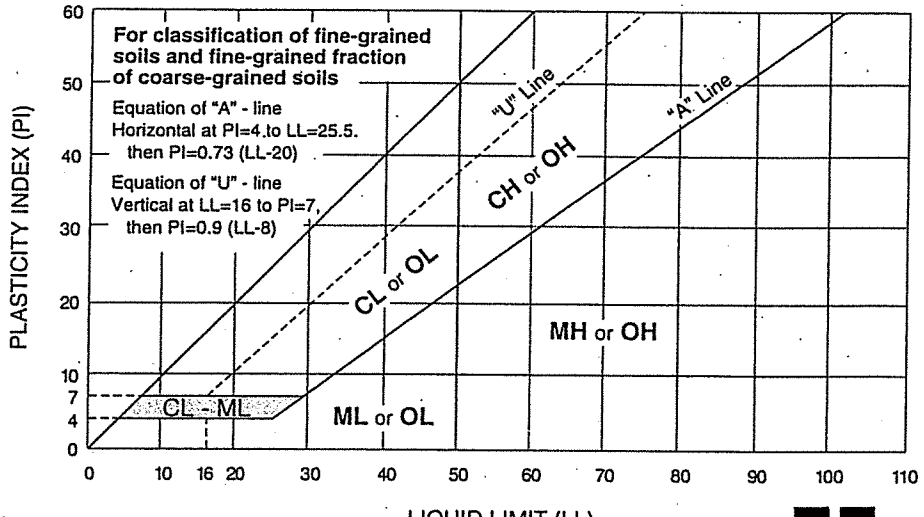
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.

[N] PI ≥ 4 and plots on or above "A" line.

[O] PI < 4 or plots below "A" line.

[P] PI plots on or above "A" line.

[Q] PI plots below "A" line.



# ROCK CLASSIFICATION
**(Based on ASTM C-294)**

## Sedimentary Rocks

Sedimentary rocks are stratified materials laid down by water or wind. The sediments may be composed of particles or pre-existing rocks derived by mechanical weathering, evaporation or by chemical or organic origin. The sediments are usually indurated by cementation or compaction.

**Chert** — Very fine-grained siliceous rock composed of micro-crystalline or cyrptocrystalline quartz, chalcedony or opal. Chert is various colored, porous to dense, hard and has a conchoidal to splintery fracture.

**Claystone** — Fine-grained rock composed of or derived by erosion of silts and clays or any rock containing clay. Soft massive and may contain carbonate minerals.

**Conglomerate** — Rock consisting of a considerable amount of rounded gravel, sand and cobbles with or without interstitial or cementing material. The cementing or interstitial material may be quartz, opal, calcite, dolomite, clay, iron oxides or other materials.

**Dolomite** — A fine-grained carbonate rock consisting of the mineral dolomite [$CaMg(CO_3)_2$]. May contain noncarbonate impurities such as quartz, chert, clay minerals, organic matter, gypsum and sulfides. Reacts with hydrochloric acid (HCL).

**Limestone** — A fine-grained carbonate rock consisting of the mineral calcite ($CaCO_3$). May contain noncarbonate impurities such as quartz, chert, clay minerals, organic matter, gypsum and sulfides. Reacts with hydrochloric acid (HCL).

**Sandstone** — Rock consisting of particles of sand with or without interstitial and cementing materials. The cementing or interstitial material may be quartz, opal, calcite, dolomite, clay, iron oxides or other material.

**Shale** — Fine-grained rock composed of or derived by erosion of silts and clays or any rock containing clay. Shale is hard, platy, of fissile may be gray, black, reddish or green and may contain some carbonate minerals (calcareous shale).

**Siltstone** — Fine grained rock composed of or derived by erosion of silts or rock containing silt. Siltstones consist predominantly of silt sized particles (0.0625 to 0.002 mm in diameter) and are intermediate rocks between claystones and sandstones and may contain carbonate minerals.

# ROCK CLASSIFICATION
**(Based on ASTM C-294)**

## Metamorphic Rocks

Metamorphic rocks form from igneous, sedimentary, or pre-existing metamorphic rocks in response to changes in chemical and physical conditions occurring within the earth's crust after formation of the original rock. The changes may be textural, structural, or mineralogic and may be accompanied by changes in chemical composition. The rocks are dense and may be massive but are more frequently foliated (laminated or layered) and tend to break into platy particles. The mineral composition is very variable depending in part on the degree of metamorphism and in part on the composition of the original rock.

**Marble** — A recrystallized medium- to coarse-grained carbonate rock composed of calcite or dolomite, or calcite and dolomite. The original impurities are present in the form of new minerals, such as micas, amphiboles, pyroxenes, and graphite.

**Metaquartzite** — A granular rock consisting essentially of recrystallized quartz. Its strength and resistance to weathering derive from the interlocking of the quartz grains.

**Slate** — A fine-grained metamorphic rock that is distinctly laminated and tends to split into thin parallel layers. The mineral composition usually cannot be determined with the unaided eye.

**Schist** — A highly layered rock tending to split into nearly parallel planes (schistose) in which the grain is coarse enough to permit identification of the principal minerals. Schists are subdivided into varieties on the basis of the most prominent mineral present in addition to quartz or to quartz and feldspars; for instance, mica schist. Greenschist is a green schistose rock whose color is due to abundance of one or more of the green minerals, chlorite or amphibole, and is commonly derived from altered volcanic rock.

**Gneiss** — One of the most common metamorphic rocks, usually formed from igneous or sedimentary rocks by a higher degree of metamorphism than the schists. It is characterized by a layered or foliated structure resulting from approximately parallel lenses and bands of platy minerals, usually micas or prisms, usually amphiboles, and of granular minerals, usually quartz and feldspars. All intermediate varieties between gneiss and schist and between gneiss and granite are often found in the same areas in which well-defined gneisses occur.

# ROCK CLASSIFICATION
**(Based on ASTM C-294)**

## Igneous Rocks

Igneous rocks are formed by cooling from a molten rock mass (magma). Igneous rocks are divided into two classes (1) plutonic, or intrusive, that have cooled slowly within the earth; and (2) volcanic, or extrusive, that formed from quickly cooled lavas. Plutonic rocks have grain sizes greater than approximately 1 mm, and are classified as coarse- or medium-grained. Volcanic rocks have grain sizes less than approximately 1 mm, and are classified as fine-grained. Volcanic rocks frequently contain glass. Both plutonic and volcanic rocks may consist of porphyries that are characterized by the presence of large mineral grains in a fine-grained or glassy groundmass. This is the result of sharp changes in rate of cooling or other physico-chemical conditions during solidification of the melt.

**Granite**

Granite is a medium- to coarse-grained light-colored rock characterized by the presence of potassium feldspar with lesser amounts of plagioclase feldspars and quartz. The characteristic potassium feldspars are othoclase or microcline, or both; the common plagioclase feldspars are albite and oligoclase. Feldspars are more abundant than quartz. Dark-colored mica (biotite) is usually present, and light-colored mica (muscovite) is frequently present. Other dark-colored ferromagnesian minerals, especially honblende, may be present in amounts less than those of the light-colored constituents.

**Quartz-Monzonite and Grano-Diorite**

Rocks similar to granite but contain more plagioclase feldspar than potassium feldspar.

**Basalt**

Fine-grained extrusive equivalent of gabbro and diabase. When basalt contains natural glass, the glass is generally lower in silica content than that of the lighter-colored extrusive rocks.

## LABORATORY TEST
## SIGNIFICANCE AND PURPOSE

| TEST | SIGNIFICANCE | PURPOSE |
|---|---|---|
| *California Bearing Ratio* | Used to evaluate the potential strength of subgrade soil, subbase, and base course material, including recycled materials for use in road and airfield pavements. | *Pavement Thickness Design* |
| *Consolidation* | Used to develop an estimate of both the rate and amount of both differential and total settlement of a structure. | *Foundation Design* |
| *Direct Shear* | Used to determine the consolidated drained shear strength of soil or rock. | *Bearing Capacity, Foundation Design, and Slope Stability* |
| *Dry Density* | Used to determine the in-place density of natural, inorganic, fine-grained soils. | *Index Property Soil Behavior* |
| *Expansion* | Used to measure the expansive potential of fine-grained soil and to provide a basis for swell potential classification. | *Foundation and Slab Design* |
| *Gradation* | Used for the quantitative determination of the distribution of particle sizes in soil. | *Soil Classification* |
| *Liquid & Plastic Limit, Plasticity Index* | Used as an integral part of engineering classification systems to characterize the fine-grained fraction of soils, and to specify the fine-grained fraction of construction materials. | *Soil Classification* |
| *Permeability* | Used to determine the capacity of soil or rock to conduct a liquid or gas. | *Groundwater Flow Analysis* |
| *pH* | Used to determine the degree of acidity or alkalinity of a soil. | *Corrosion Potential* |
| *Resistivity* | Used to indicate the relative ability of a soil medium to carry electrical currents. | *Corrosion Potential* |
| *R-Value* | Used to evaluate the potential strength of subgrade soil, subbase, and base course material, including recycled materials for use in road and airfield pavements. | *Pavement Thickness Design* |
| *Soluble Sulphate* | Used to determine the quantitative amount of soluble sulfates within a soil mass. | *Corrosion Potential* |
| *Unconfined Compression* | To obtain the approximate compressive strength of soils that possess sufficient cohesion to permit testing in the unconfined state. | *Bearing Capacity Analysis for Foundations* |
| *Water Content* | Used to determine the quantitative amount of water in a soil mass. | *Index Property Soil Behavior* |

## REPORT TERMINOLOGY
## (Based on ASTM D653)

| | |
|---|---|
| *Allowable Soil Bearing Capacity* | The recommended maximum contact stress developed at the interface of the foundation element and the supporting material. |
| *Alluvium* | Soil, the constituents of which have been transported in suspension by flowing water and subsequently deposited by sedimentation. |
| *Aggregate Base Course* | A layer of specified material placed on a subgrade or subbase usually beneath slabs or pavements. |
| *Backfill* | A specified material placed and compacted in a confined area. |
| *Bedrock* | A natural aggregate of mineral grains connected by strong and permanent cohesive forces. Usually requires drilling, wedging, blasting or other methods of extraordinary force for excavation. |
| *Bench* | A horizontal surface in a sloped deposit. |
| *Caisson (Drilled Pier or Shaft)* | A concrete foundation element cast in a circular excavation which may have an enlarged base. Sometimes referred to as a cast-in-place pier or drilled shaft. |
| *Coefficient of Friction* | A constant proportionality factor relating normal stress and the corresponding shear stress at which sliding starts between the two surfaces. |
| *Colluvium* | Soil, the constituents of which have been deposited chiefly by gravity such as at the foot of a slope or cliff. |
| *Compaction* | The densification of a soil by means of mechanical manipulation |
| *Concrete Slab-on-Grade* | A concrete surface layer cast directly upon a base, subbase or subgrade, and typically used as a floor system. |
| *Differential Movement* | Unequal settlement or heave between, or within foundation elements of structure. |
| *Earth Pressure* | The pressure exerted by soil on any boundary such as a foundation wall. |
| *ESAL* | Equivalent Single Axle Load, a criteria used to convert traffic to a uniform standard, (18,000 pound axle loads). |
| *Engineered Fill* | Specified material placed and compacted to specified density and/or moisture conditions under observations of a representative of a geotechnical engineer. |
| *Equivalent Fluid* | A hypothetical fluid having a unit weight such that it will produce a pressure against a lateral support presumed to be equivalent to that produced by the actual soil. This simplified approach is valid only when deformation conditions are such that the pressure increases linearly with depth and the wall friction is neglected. |
| *Existing Fill (or Man-Made Fill)* | Materials deposited throughout the action of man prior to exploration of the site. |
| *Existing Grade* | The ground surface at the time of field exploration. |

## REPORT TERMINOLOGY
## (Based on ASTM D653)

| | |
|---|---|
| ***Expansive Potential*** | The potential of a soil to expand (increase in volume) due to absorption of moisture. |
| ***Finished Grade*** | The final grade created as a part of the project. |
| ***Footing*** | A portion of the foundation of a structure that transmits loads directly to the soil. |
| ***Foundation*** | The lower part of a structure that transmits the loads to the soil or bedrock. |
| ***Frost Depth*** | The depth at which the ground becomes frozen during the winter season. |
| ***Grade Beam*** | A foundation element or wall, typically constructed of reinforced concrete, used to span between other foundation elements such as drilled piers. |
| ***Groundwater*** | Subsurface water found in the zone of saturation of soils or within fractures in bedrock. |
| ***Heave*** | Upward movement. |
| ***Lithologic*** | The characteristics which describe the composition and texture of soil and rock by observation. |
| ***Native Grade*** | The naturally occurring ground surface. |
| ***Native Soil*** | Naturally occurring on-site soil, sometimes referred to as natural soil. |
| ***Optimum Moisture Content*** | The water content at which a soil can be compacted to a maximum dry unit weight by a given compactive effort. |
| ***Perched Water*** | Groundwater, usually of limited area maintained above a normal water elevation by the presence of an intervening relatively impervious continuous stratum. |
| ***Scarify*** | To mechanically loosen soil or break down existing soil structure. |
| ***Settlement*** | Downward movement. |
| ***Skin Friction (Side Shear)*** | The frictional resistance developed between soil and an element of the structure such as a drilled pier. |
| ***Soil (Earth)*** | Sediments or other unconsolidated accumulations of solid particles produced by the physical and chemical disintegration of rocks, and which may or may not contain organic matter. |
| ***Strain*** | The change in length per unit of length in a given direction. |
| ***Stress*** | The force per unit area acting within a soil mass. |
| ***Strip*** | To remove from present location. |
| ***Subbase*** | A layer of specified material in a pavement system between the subgrade and base course. |
| ***Subgrade*** | The soil prepared and compacted to support a structure, slab or pavement system. |

# COYOTE CREEK FILING NO. 4
# UTILITY STUDY

November 2021

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(Project No. 16093.00)

# Table of Contents

CERTIFICATION STATEMENT ..... ii
I. INTRODUCTION ..... 1
Project Location and Description ..... 1
II. POTABLE WATER SYSTEM ..... 2
Existing System and Proposed System ..... 2
Calculated Potable Water Demands and Design Flow Requirements ..... 2
Hydraulic Analysis ..... 3
Conclusions ..... 3
III. NON-POTABLE WATER SYSTEM ..... 4
Existing and Proposed System ..... 4
Calculated Non-Potable Water Demands and Design Flow Requirements ..... 4
Hydraulic Analysis ..... 5
Conclusions ..... 5
IV. SANITARY SEWER SYSTEM ..... 6
Existing and Proposed System ..... 6
Calculated Wastewater Flows and Design Flow Requirements ..... 6
Hydraulic Analysis ..... 7
Conclusions ..... 7
V. CONCLUSION ..... 8
VI. REFERENCES ..... 8

## Appendices

A: Vicinity Map
B: Potable Water Demand Table, Model Map, WaterCAD Map & Results
C: Non-Potable Water Demand Table, Model Map, WaterCAD Map & Results
D: Sanitary Sewer Loading, Basin Map, FlowMaster Results

# CERTIFICATION STATEMENT

This Utility Report for the design of the Coyote Creek Filing No. 4 development was prepared by me or under my direct supervision in accordance with the City of Fort Lupton's Standards and Specifications and acceptable professional practices of the industry. We acknowledge that the City of Fort Lupton's review of this Utility Study is only for general conformance with submittal requirements, current design criteria and standard engineering principles and practices. We are also aware of the provisions of the City Code of the City of Fort Lupton.

_____

Andrew J. Hugill, Registered Professional Engineer
Colorado Professional Engineer No. 57007
For and on behalf of JR Engineering, LLC

# I. INTRODUCTION

## Project Location and Description

Coyote Creek Filing No. 4 is a proposed single-family residential Planned Unit Development (PUD) located within Section 5, Township 1 North, Range 66 West of the 6th Principal Meridian, City of Fort Lupton, Weld County, Colorado.

The approximately 13-acre site is bounded by the Shortline Ditch regional channel to the west, Twombly Elementary School to the north, and Coyote Creek Golf Course to the southeast. A vicinity map is included in Appendix A.

This report presents the utility system analysis for the potable water, non-potable water, and sanitary sewer systems for Coyote Creek Filing No. 4.

# II. POTABLE WATER SYSTEM

## Existing System and Proposed System

Potable water for Coyote Creek Filing No. 4 will be supplied by the City of Fort Lupton. There is an existing 18" high-pressure potable water mainline within 9th Street, and an existing 12" potable water mainline within 4th Street with an 8" stub north into the site.

An 8" proposed waterline will connect to the 18" potable water mainline in 9th Street by means of a PRV and will continue south along the existing road west of Twombly Elementary School. An 8" and 12" waterline will loop through the proposed development and connect with the existing 12" water mainline in 4th Street. A non-potable water interconnect is proposed on the potable waterline within Lupton Lane. A map of the existing and proposed potable water system is included in Appendix B.

## Calculated Potable Water Demands and Design Flow Requirements

The basis of the design for this study was set forth in Chapter 3 of the City of Fort Lupton *Standards and Specifications for the Design and Construction of Public Improvements*, 2014. The following is a summary of the applicable criteria for Coyote Creek Filing No. 4, a single-family detached residential development:

Criteria for Establishing Potable Water Demands

| Zoning | Type of Development | People per Unit | Per Capita Demand |
|---|---|---|---|
| R-1 to R-5 | Single Family Detached | 2.62 | 200 gallons |

Maximum Day Factor 2.5
Peak Hour Factor 4.0

Criteria for Operating Pressures and Sizing of Mains

| | Minimum Pressure | Maximum Head Loss | Maximum Velocity | Hazen-Williams "C" Coefficient |
|---|---|---|---|---|
| Peak Hour Demand | 50 psi | 2 ft/1000 ft | 5 ft/s | 130 |
| Maximum Day Demand + Fire Flow | 20 psi | N/A | 7 ft/s | |

Fire Flow Demand

Single Family Detached* 1,500 gpm

*Per IFC Table B105.1(2) for assumed Type V-B and total building area < 3,600 SF

The total potable water demand for Coyote Creek Filing No. 4 is shown **Table 1** below.

**Table 1: Coyote Creek Filing No. 4 Total Potable Demand Summary Table**

| Dwelling Units | Unit Demand (gpd/DU) | Average Day Demand (gpd) | Maximum Day Demand (gpd) | Peak Hour Demand (gpd) |
|---|---|---|---|---|
| 59 | 524 | 30,916 | 77,290 | 123,664 |

A non-potable water interconnect is proposed on the potable waterline within Lupton Lane. The total non-potable interconnect maximum day demand is 24,256 gpd, and the peak-hour demand is 38,809 gpd. The interconnect demand corresponds to the amount of water drawn out of interconnect reservoir, which is fed by the potable water system, to supply the non-potable water network in the event that the non-potable system is down. The demands for each modeled junction within Coyote Creek Filing No. 4 are shown in Appendix B.

## Hydraulic Analysis

Bentley's WaterCAD V.8 was used to model and analyze the proposed potable water distribution system. The City is still in the process of obtaining flow pressure tests for both 4th Street and 9th Street. Prior to obtaining the flow test on 4th Street, a system pressure of 85psi was assumed and an HGL of 5113' was estimated for the boundary condition at 4th Street. An HGL of 5103' was estimated for the connection to the 18" high-pressure waterline in 9th Street, just before the proposed PRV. The following assumptions were used in developing the WaterCAD model:

- There is an unlimited water supply, provided to the site from the two connection points to the existing water lines in 4th Street and 9th Street.
- Water demand for the each proposed residential lot is taken at the node nearest the center of the lot.
- Existing and proposed water lines are assumed to be 5' in depth.

WaterCAD scenarios were set up to analyze maximum hour demand plus peak irrigation flow, and maximum daily demand plus peak irrigation flow and fire flow. A separate scenario was run for each of the three proposed hydrant locations.

The design of the water distribution system is based on the maximum daily demand plus peak irrigation flow and fire flow scenarios, which were the higher demand scenarios compared to the maximum hour demand plus peak irrigation flow scenario. In order to keep maximum daily demand plus fire flow velocities below 7 ft/s, the 8" stub off of the waterline in 4th Street cannot be utilized and a 12" connection is being proposed instead. Results of the hydraulic analysis and a map of the WaterCAD pipes and nodes are included in Appendix B.

## Conclusions

This study presents the results of the analysis performed for the potable water system associated with the proposed Coyote Creek Filing No. 4 development. The design and layout of the potable water system as shown and discussed in this study and in the Appendices conform to the Fort Lupton design standards and requirements for fire protection, minimum pressures and maximum velocities.

# III. NON-POTABLE WATER SYSTEM

## Existing and Proposed System

Non-potable water for the Coyote Creek Filing No. 4 development will be supplied by the City of Fort Lupton via an existing 30" non-potable waterline that bisects the Filing No. 4 site.

A 4" non-potable waterline is proposed to loop through the Filing No. 4 development and connect to the existing 30" non-potable waterline through a metered tap on the southeast corner of the site. A potable water interconnect is also proposed within Lupton Lane. A map of the existing and proposed non-potable water system is included in Appendix C.

## Calculated Non-Potable Water Demands and Design Flow Requirements

The basis of design for this study was set forth in Chapter 3 of the City of Fort Lupton *Standards and Specifications for the Design and Construction of Public Improvements,* 2014. The following is a summary of the applicable water system criteria and assumed parameters used to establish the non-potable water demand and design:

| Land Use | Assumed Percentage of Total Area to be Irrigated | Average Day Demand* |
|---|---|---|
| Single-Family Residential | 45% | 1.55 gpm/acre |
| Park | 75% | |

*Established using the SACWSD Design Standards and Criteria

| | |
|---|---|
| Maximum Day Factor | 2.5 |
| Peak Hour Factor | 4.0 |

Criteria for Operating Pressures and Sizing of Mains

| | Minimum Pressure | Maximum Head Loss | Maximum Velocity | Hazen-Williams "C" Coefficient |
|---|---|---|---|---|
| Peak Hour Demand and Maximum Day Demand | 50 psi | 2 ft/1000 ft | 5 ft/s | 130 |

Coyote Creek Filing No. 4 is comprised of 59 single-family detached residential lots, with 41 lots sized 50'x105' and 18 lots sized 60'x105' or slightly larger, and a total residential land use area of approximately 8 acres. There is also a proposed 1-acre park in the center of the development.

The total non-potable water demand for Coyote Creek Filing No. 4 is shown **Table 2** below.

**Table 2: Coyote Creek Filing No. 4 Total Non-Potable Demand Summary Table**

| Total Area (Acres) | | Total Irrigated Area (Acres) | Average Day Demand (gpd) | Maximum Day Demand (gpd) | Peak Hour Demand (gpd) |
|---|---|---|---|---|---|
| Single-Family (45% Irrigated) | Park (75% Irrigated) | | | | |
| 8 | 1 | 4.35 | 9,702 | 24,256 | 38,809 |

## Hydraulic Analysis

Bentley's WaterCAD V.8 was used to model and analyze the proposed non-potable water distribution system for two separate scenarios. In one scenario, the non-potable water was supplied solely by the potable water interconnect in Lupton Lane. The potable water interconnect was assigned an HGL of 5112', determined from the potable water model. In the second scenario, the non-potable water was only supplied by the connection to the existing 30" non-potable waterline, and an HGL of 5120' was estimated under the assumption of an 85 psi system pressure. The minimum operating pressure for the system to still meet City criteria was determined to be 50 psi, which corresponds to an HGL of 5040'. The non-potable network was not modeled in a scenario where it was supplied by both non-potable water connections, because at any given time, the non-potable water system will only ever be supplied by one of the two.

The following assumptions were used in developing the WaterCAD model:

- There is an unlimited water supply in each scenario, provided to the site from either the proposed potable water connection in Lupton Lane, or the existing 30" non-potable waterline.
- Existing and proposed non-potable water lines are assumed to be 5' in depth.

Each of the two scenarios was analyzed using maximum hour demand and maximum day demand. Results of the hydraulic analysis and a map of the WaterCAD pipes and nodes for each scenario are included in Appendix C.

## Conclusions

This study presents the results of the analysis performed for the non-potable water system associated with the proposed Coyote Creek Filing No. 4 Development. The design and layout of the non-potable water system as shown and discussed in this study and in the Appendices conform to the Fort Lupton design standards and requirements for minimum pressures and maximum velocities.

# IV. SANITARY SEWER SYSTEM

## Existing and Proposed System

The Coyote Creek Filing No. 4 sanitary sewer will be serviced by the existing Fort Lupton 8" sanitary sewer that runs north along the site's western property boundary to an existing lift station located in the northwest corner of the site.

The proposed 8" Coyote Creek Filing No. 4 sanitary sewer network will tie into the existing 8" sanitary pipe with new manholes two locations—one in the southwest corner of the development, north of 4th Street, and one in the northwest corner of the development, just south of the existing lift station. A map of the existing and proposed sanitary sewer system is included in Appendix D.

## Calculated Wastewater Flows and Design Flow Requirements

The basis of design for this study was set forth in Chapter 4 of the City of Fort Lupton *Standards and Specifications for the Design and Construction of Public Improvements*, 2014. The following is a summary of the criteria used to establish the wastewater flows and preliminary sanitary sewer design:

Criteria for Establishing Wastewater Flows

| | |
|---|---|
| Single-Family Residential Population Density: | 2.90 People/Unit |
| Residential Average Use: | 70 Gallons/Capita/Day |
| Peak Factor: | 3.0 |
| Infiltration and Inflow Rate (for all uses): | 1000 Gallons/Acre/Day |

Design Requirements

| Diameter | Minimum Slope | Maximum Slope | Minimum Flow Velocity (at peak design flow, and n=0.015) |
|---|---|---|---|
| 8 in (minimum) | 0.50% | 19% | 2 ft/s |

The proposed Coyote Creek Filing No. 4 development has a total area of approximately 13.25 acres, comprised of 59 single-family detached residential lots. This corresponds to an estimated total population of 171 and an estimated population density of 13 people per acre. The total wastewater design flows calculated for Coyote Creek Filing No. 4 are shown in **Table 3** below.

**Table 3: Coyote Creek Filing No. 4 Total Wastewater Design Flows Summary Table**

| Acres | DU's | Flow Rate (gpd) | | | |
|---|---|---|---|---|---|
| | | Average Day | Peak Day | Infiltration and Inflow | Peak Day Flow + Infiltration and Inflow |
| 13.25 | 59 | 11,977 | 35,931 | 13,250 | 49,181 |

Wastewater from Coyote Creek Filing No. 4 will be ordinary domestic sewage from single-family residences, and will not contain industrial waste.

## Hydraulic Analysis

Given the proposed grade and proposed sanitary sewer layout, the site was divided into three basins and analyzed at three design points, illustrated in the sanitary sewer system map in Appendix D. The sanitary wastewater loading calculations for each basin can also be found in Appendix D.

Bentley's FlowMaster hydraulic analysis software was used to analyze the proposed sanitary sewer system, and the results are included in Appendix D. Note that the flow velocities range from 1.44 ft/s to 1.80 ft/s, which fall below the minimum flow velocity criteria of 2 ft/s. The low velocities are typical considering the low number of lots contributing to the sewer system. The proposed 8" sanitary sewer pipes are the minimum size allowed, and steeper slopes are not feasible given depth constraints set by the existing sanitary sewer line downstream.

## Conclusions

This study presents the results of the analysis performed for the sanitary sewer system associated with the proposed Coyote Creek Filing No. 4 Development. The design and layout of the sanitary sewer system as shown and discussed in this study and Appendices conform to the Fort Lupton design standards.

# V. CONCLUSION

This study presents the results of the analyses performed for the potable water, non-potable water, and sanitary sewer systems associated with the Coyote Creek Filing No. 4 development. The design of the systems as shown and discussed is in conformance with the Fort Lupton design standards and requirements.

# VI. REFERENCES

1. 2018 International Fire Code; 2018
2. City of Fort Lupton, Standards and Specifications for the Design and Construction of Public Improvements; 2014
3. City of Fort Lupton and Clear Water Solutions, Inc., 2018 Municipal Water Efficiency Plan; 2018

# Appendix A
# Vicinity Map

500 250 0 500

ORIGINAL SCALE: 1" = 500'

APPENDIX A
VICINITY MAP
JOB NO. 16093.00
2021-11-10
SHEET 1 OF 1

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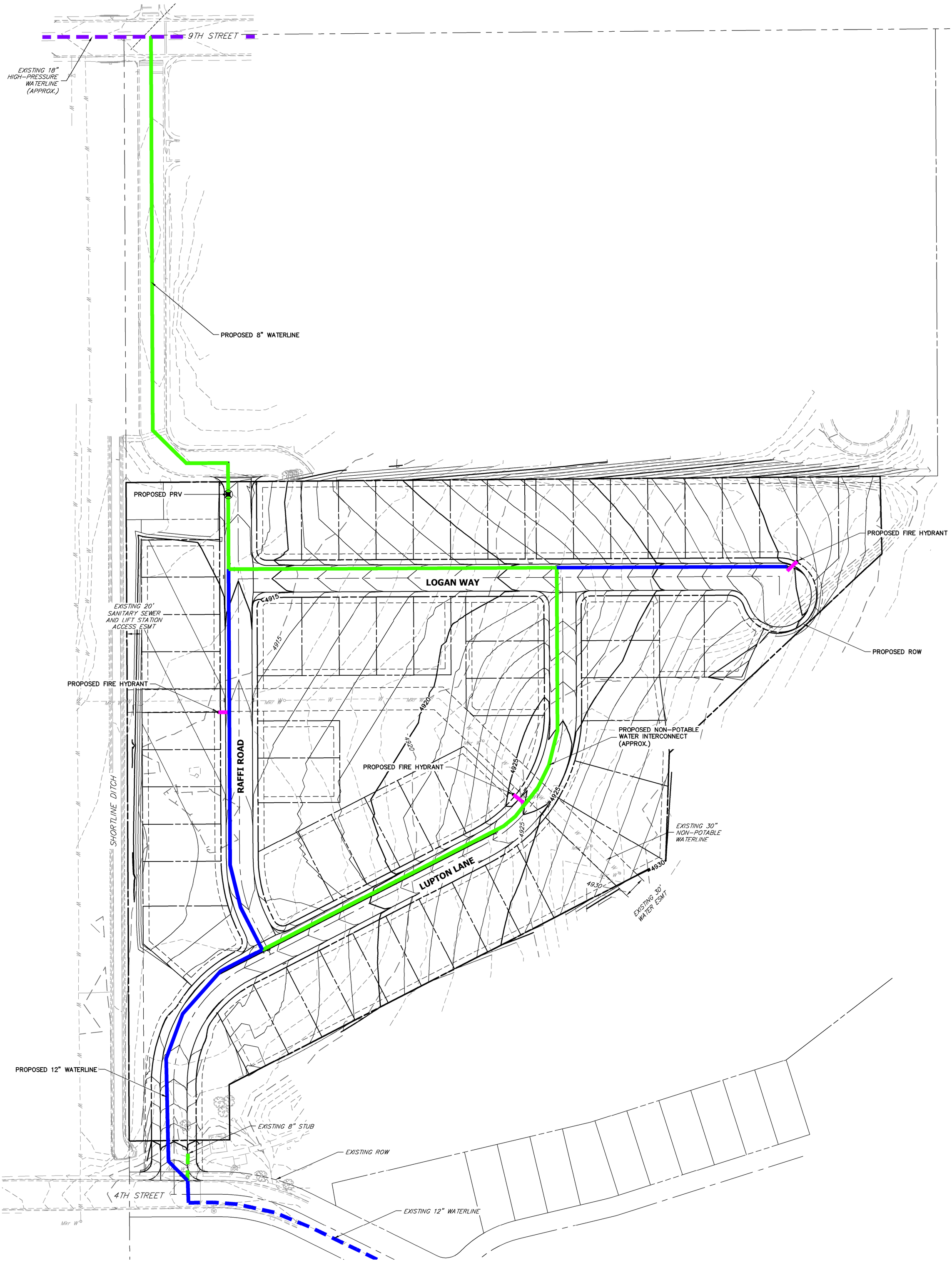
# Appendix B
# Potable Water System Demands, Model Map, and WaterCAD Map & Results

# COYOTE CREEK FILING NO. 4

## POTABLE WATER SYSTEM MAP




## COLOR CODING LEGEND

- 6" ø PROPOSED WATER LINE (FIRE HYDRANT)
- 8" ø PROPOSED WATER MAIN
- 12" ø PROPOSED WATER MAIN
- 8" ø EXISTING WATER MAIN
- 12" ø EXISTING WATER MAIN
- 18" ø EXISTING WATER MAIN

N

60 30 0 60 120

ORIGINAL SCALE: 1" = 60'

POTABLE WATER SYSTEM MAP
COYOTE CREEK FILING NO. 4
JOB NO. 1609300
2021-11-17
SHEET 1 OF 1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| | |
|---|---|
| Project Name | Coyote Creek Filing No. 4 |
| Project Number | 16093.00 |
| Date | 11/8/2021 |
| By | SWW |

| Fort Lupton Criteria | |
|---|---|
| | Potable |
| Avg Day Demand (gpud) | 524 |
| Max Day Factor | 2.5 |
| Max Hour Factor | 4 |
| Fire Flow (gpm) | 1500 |

| Potable Water Demand | | | | | | | |
|---|---|---|---|---|---|---|---|
| Junction | Surface Elevation | TOP Elevation | No. DU Served | Demand (gpm) | | | |
| | | | | Average Day | Max Day | Fire Flow | Peak Hour |
| J-2 | 4917.09 | 4912.09 | 8 | 2.91 | 7.28 | | 11.64 |
| J-3 | 4920.18 | 4915.18 | 4 | 1.46 | 3.64 | | 5.82 |
| J-5 | 4924.81 | 4919.81 | 6 | 2.18 | 5.46 | | 8.73 |
| J-6 | 4929.84 | 4924.84 | 5 | 1.82 | 4.55 | 1500 | 7.28 |
| J-7 | 4924.15 | 4919.15 | 5 | 1.82 | 4.55 | | 7.28 |
| J-8 | 4925.01 | 4920.01 | 4 | 1.46 | 3.64 | 1500 | 5.82 |
| J-9 | 4921.81 | 4916.81 | 6 | 2.18 | 5.46 | | 8.73 |
| J-10 | 4918.37 | 4913.37 | 5 | 1.82 | 4.55 | | 7.28 |
| J-12 | 4915.35 | 4910.35 | 3 | 1.09 | 2.73 | | 4.37 |
| J-13 | 4917.40 | 4912.40 | 4 | 1.46 | 3.64 | | 5.82 |
| J-14 | 4916.18 | 4911.18 | 4 | 1.46 | 3.64 | | 5.82 |
| J-15 | 4914.92 | 4909.92 | 5 | 1.82 | 4.55 | 1500 | 7.28 |
| Total | | | 59 | 21.47 | 53.67 | | 85.88 |

## TABLE B105.1(2) REFERENCE TABLE FOR TABLES B105.1(1) AND B105.2

| FIRE-FLOW CALCULATION AREA (square feet) | | | | | FIRE-FLOW (gallons per minute)[b] | FLOW DURATION (hours) |
|---|---|---|---|---|---|---|
| Type IA and IB[a] | Type IIA and IIIA[a] | Type IV and V-A[a] | Type IIB and IIIB[a] | Type V-B[a] | | |
| 0-22,700 | 0-12,700 | 0-8,200 | 0-5,900 | 0-3,600 | 1,500 | 2 |
| 22,701-30,200 | 12,701-17,000 | 8,201-10,900 | 5,901-7,900 | 3,601-4,800 | 1,750 | |
| 30,201-38,700 | 17,001-21,800 | 10,901-12,900 | 7,901-9,800 | 4,801-6,200 | 2,000 | |
| 38,701-48,300 | 21,801-24,200 | 12,901-17,400 | 9,801-12,600 | 6,201-7,700 | 2,250 | |
| 48,301-59,000 | 24,201-33,200 | 17,401-21,300 | 12,601-15,400 | 7,701-9,400 | 2,500 | |
| 59,001-70,900 | 33,201-39,700 | 21,301-25,500 | 15,401-18,400 | 9,401-11,300 | 2,750 | |
| 70,901-83,700 | 39,701-47,100 | 25,501-30,100 | 18,401-21,800 | 11,301-13,400 | 3,000 | 3 |
| 83,701-97,700 | 47,101-54,900 | 30,101-35,200 | 21,801-25,900 | 13,401-15,600 | 3,250 | |
| 97,701-112,700 | 54,901-63,400 | 35,201-40,600 | 25,901-29,300 | 15,601-18,000 | 3,500 | |
| 112,701-128,700 | 63,401-72,400 | 40,601-46,400 | 29,301-33,500 | 18,001-20,600 | 3,750 | |
| 128,701-145,900 | 72,401-82,100 | 46,401-52,500 | 33,501-37,900 | 20,601-23,300 | 4,000 | 4 |
| 145,901-164,200 | 82,101-92,400 | 52,501-59,100 | 37,901-42,700 | 23,301-26,300 | 4,250 | |
| 164,201-183,400 | 92,401-103,100 | 59,101-66,000 | 42,701-47,700 | 26,301-29,300 | 4,500 | |
| 183,401-203,700 | 103,101-114,600 | 66,001-73,300 | 47,701-53,000 | 29,301-32,600 | 4,750 | |
| 203,701-225,200 | 114,601-126,700 | 73,301-81,100 | 53,001-58,600 | 32,601-36,000 | 5,000 | |
| 225,201-247,700 | 126,701-139,400 | 81,101-89,200 | 58,601-65,400 | 36,001-39,600 | 5,250 | |
| 247,701-271,200 | 139,401-152,600 | 89,201-97,700 | 65,401-70,600 | 39,601-43,400 | 5,500 | |
| 271,201-295,900 | 152,601-166,500 | 97,701-106,500 | 70,601-77,000 | 43,401-47,400 | 5,750 | |
| 295,901-Greater | 166,501-Greater | 106,501-115,800 | 77,001-83,700 | 47,401-51,500 | 6,000 | |
| — | — | 115,801-125,500 | 83,701-90,600 | 51,501-55,700 | 6,250 | |
| — | — | 125,501-135,500 | 90,601-97,900 | 55,701-60,200 | 6,500 | |
| — | — | 135,501-145,800 | 97,901-106,800 | 60,201-64,800 | 6,750 | |
| — | — | 145,801-156,700 | 106,801-113,200 | 64,801-69,600 | 7,000 | |
| — | — | 156,701-167,900 | 113,201-121,300 | 69,601-74,600 | 7,250 | |
| — | — | 167,901-179,400 | 121,301-129,600 | 74,601-79,800 | 7,500 | |
| — | — | 179,401-191,400 | 129,601-138,300 | 79,801-85,100 | 7,750 | |
| — | — | 191,401-Greater | 138,301-Greater | 85,101-Greater | 8,000 | |

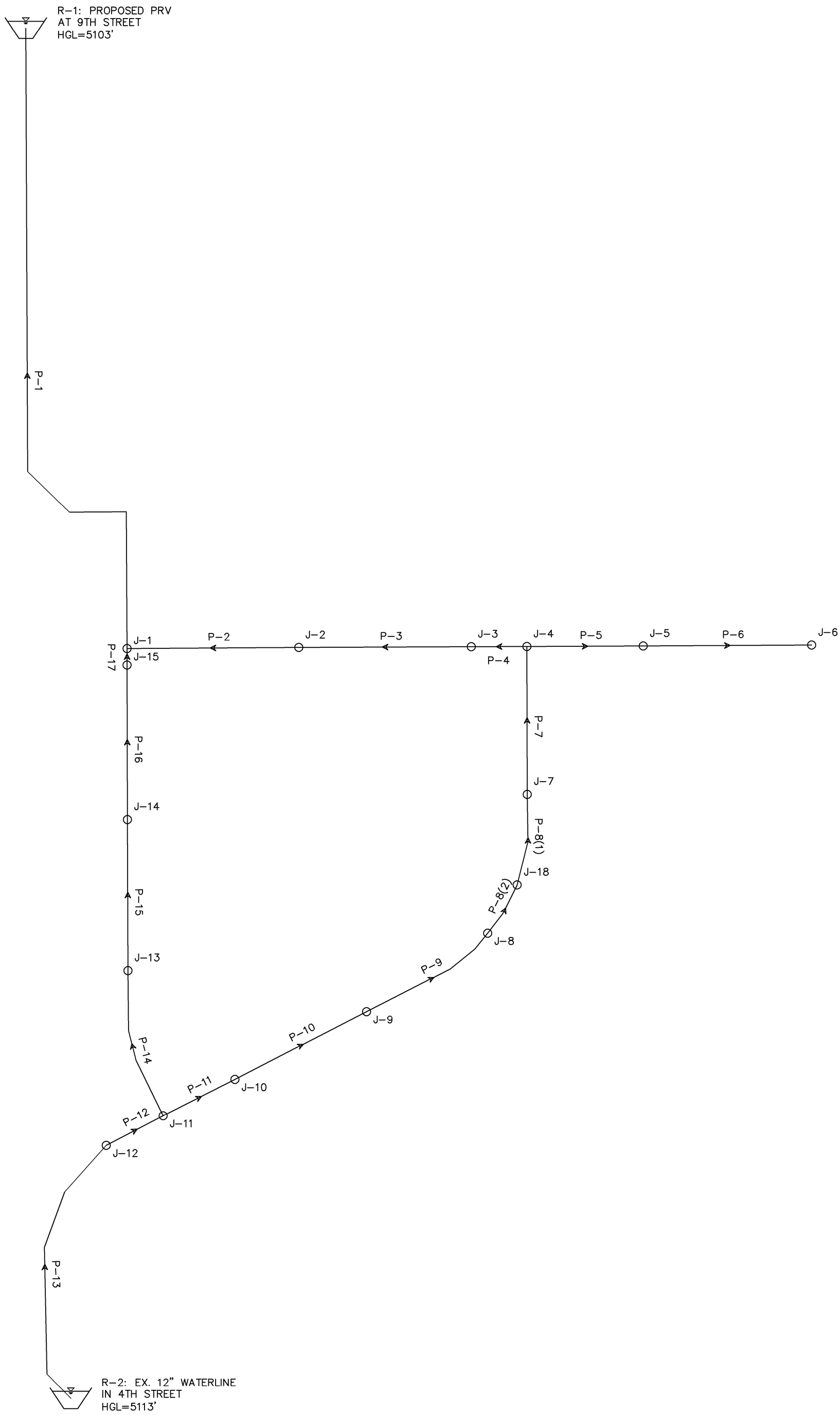
For SI: 1 square foot = 0.0929 $m^2$, 1 gallon per minute = 3.785 L/m, 1 pound per square inch = 6.895 kPa.

a. Types of construction are based on the *International Building Code*.

b. Measured at 20 psi residual pressure.

# COYOTE CREEK FILING NO. 4

## POTABLE WATERCAD MAP




POTABLE WATERCAD MAP
COYOTE CREEK FILING NO. 4
JOB NO. 1609300
2021-11-17
SHEET 1 OF 1

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| Potable - Maximum Hour + Irrigation (Pipe) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Label | Length (ft) | Diameter (in) | Material | Hazen-Williams C | Flow (Absolute) (gpm) | Velocity (Maximum) (ft/s) | Headloss Gradient (ft/ft) |
| P-1 | 756 | 8 | PVC | 130 | 773 | 4.93 | 0.011 |
| P-13 | 307 | 12 | PVC | 130 | 886 | 2.51 | 0.002 |
| P-12 | 70 | 12 | PVC | 130 | 881 | 2.5 | 0.002 |
| P-14 | 166 | 12 | PVC | 130 | 687 | 1.95 | 0.001 |
| P-15 | 164 | 12 | PVC | 130 | 681 | 1.93 | 0.001 |
| P-16 | 168 | 12 | PVC | 130 | 675 | 1.92 | 0.001 |
| P-17 | 18 | 12 | PVC | 150 | 668 | 1.9 | 0.001 |
| P-11 | 87 | 8 | PVC | 130 | 194 | 1.24 | 0.001 |
| P-10 | 161 | 8 | PVC | 130 | 187 | 1.19 | 0.001 |
| P-9 | 159 | 8 | PVC | 130 | 178 | 1.14 | 0.001 |
| P-8(2) | 62 | 8 | PVC | 130 | 172 | 1.1 | 0.001 |
| P-8(1) | 100 | 8 | PVC | 130 | 145 | 0.93 | 0.001 |
| P-7 | 161 | 8 | PVC | 130 | 138 | 0.88 | 0 |
| P-4 | 60 | 8 | PVC | 130 | 122 | 0.78 | 0 |
| P-3 | 187 | 8 | PVC | 130 | 116 | 0.74 | 0 |
| P-2 | 187 | 8 | PVC | 130 | 105 | 0.67 | 0 |
| P-5 | 126 | 12 | PVC | 130 | 16 | 0.05 | 0 |
| P-6 | 183 | 12 | PVC | 130 | 7 | 0.02 | 0 |

| Potable - Maximum Hour + Irrigation (Junction) | | | | |
|---|---|---|---|---|
| Label | Elevation (ft) | Demand (gpm) | Hydraulic Grade (ft) | Pressure (psi) |
| J-12 | 4,910.35 | 4.37 | 5,112.69 | 88 |
| J-1 | 4,909.79 | 0 | 5,111.91 | 87 |
| J-11 | 4,911.49 | 0 | 5,112.55 | 87 |
| J-13 | 4,912.40 | 5.82 | 5,112.34 | 87 |
| J-14 | 4,911.18 | 5.82 | 5,112.14 | 87 |
| J-15 | 4,909.92 | 7.28 | 5,111.93 | 87 |
| J-2 | 4,912.09 | 11.64 | 5,111.97 | 86 |
| J-10 | 4,913.37 | 7.28 | 5,112.47 | 86 |
| J-3 | 4,915.18 | 5.82 | 5,112.03 | 85 |
| J-4 | 4,916.20 | 0 | 5,112.05 | 85 |
| J-9 | 4,916.81 | 8.73 | 5,112.34 | 85 |
| J-5 | 4,919.81 | 8.73 | 5,112.05 | 83 |
| J-7 | 4,919.15 | 7.28 | 5,112.13 | 83 |
| J-8 | 4,920.01 | 5.82 | 5,112.22 | 83 |
| J-18 | 4,919.68 | 26.95 | 5,112.18 | 83 |
| J-6 | 4,924.84 | 7.28 | 5,112.05 | 81 |

| Potable - Maximum Day + Fire Flow (J-14) and Irrigation (Pipe) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Label | Length (ft) | Diameter (in) | Material | Hazen-Williams C | Flow (Absolute) (gpm) | Velocity (Maximum) (ft/s) | Headloss Gradient (ft/ft) |
| P-13 | 307 | 12 | PVC | 130 | 2,076.77 | 5.89 | 0.01 |
| P-12 | 70 | 12 | PVC | 130 | 2,074.04 | 5.88 | 0.01 |
| P-14 | 166 | 12 | PVC | 130 | 1,740.23 | 4.94 | 0.007 |
| P-15 | 164 | 12 | PVC | 130 | 1,736.59 | 4.93 | 0.007 |
| P-1 | 756 | 8 | PVC | 130 | 506.26 | 3.23 | 0.005 |
| P-11 | 87 | 8 | PVC | 130 | 333.81 | 2.13 | 0.002 |
| P-10 | 161 | 8 | PVC | 130 | 329.26 | 2.1 | 0.002 |
| P-9 | 159 | 8 | PVC | 130 | 323.8 | 2.07 | 0.002 |
| P-8(2) | 62 | 8 | PVC | 130 | 320.16 | 2.04 | 0.002 |
| P-8(1) | 100 | 8 | PVC | 130 | 303.32 | 1.94 | 0.002 |
| P-7 | 161 | 8 | PVC | 130 | 298.77 | 1.91 | 0.002 |
| P-4 | 60 | 8 | PVC | 130 | 288.77 | 1.84 | 0.002 |
| P-3 | 187 | 8 | PVC | 130 | 285.13 | 1.82 | 0.002 |
| P-2 | 187 | 8 | PVC | 130 | 277.85 | 1.77 | 0.002 |
| P-16 | 168 | 12 | PVC | 130 | 232.95 | 0.66 | 0 |
| P-17 | 18 | 12 | PVC | 150 | 228.4 | 0.65 | 0 |
| P-5 | 126 | 12 | PVC | 130 | 10.01 | 0.03 | 0 |
| P-6 | 183 | 12 | PVC | 130 | 4.55 | 0.01 | 0 |

| Potable - Maximum Day + Fire Flow (J-14) and Irrigation (Junction) | | | | |
|---|---|---|---|---|
| Label | Elevation (ft) | Demand (gpm) | Hydraulic Grade (ft) | Pressure (psi) |
| J-12 | 4,910.35 | 2.73 | 5,110.30 | 87 |
| J-11 | 4,911.49 | 0 | 5,109.62 | 86 |
| J-1 | 4,909.79 | 0 | 5,107.26 | 85 |
| J-2 | 4,912.09 | 7.28 | 5,107.58 | 85 |
| J-10 | 4,913.37 | 4.55 | 5,109.41 | 85 |
| J-13 | 4,912.40 | 3.64 | 5,108.45 | 85 |
| J-14 | 4,911.18 | 1,503.64 | 5,107.29 | 85 |
| J-15 | 4,909.92 | 4.55 | 5,107.27 | 85 |
| J-3 | 4,915.18 | 3.64 | 5,107.92 | 83 |
| J-4 | 4,916.20 | 0 | 5,108.03 | 83 |
| J-9 | 4,916.81 | 5.46 | 5,109.04 | 83 |
| J-7 | 4,919.15 | 4.55 | 5,108.34 | 82 |
| J-8 | 4,920.01 | 3.64 | 5,108.68 | 82 |
| J-18 | 4,919.68 | 16.84 | 5,108.54 | 82 |
| J-5 | 4,919.81 | 5.46 | 5,108.03 | 81 |
| J-6 | 4,924.84 | 4.55 | 5,108.03 | 79 |

| Potable - Maximum Day + Fire Flow (J-6) and Irrigation (Pipe) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Label | Length (ft) | Diameter (in) | Material | Hazen-Williams C | Flow (Absolute) (gpm) | Velocity (Maximum) (ft/s) | Headloss Gradient (ft/ft) |
| P-13 | 307 | 12 | PVC | 130 | 2,085.76 | 5.92 | 0.01 |
| P-12 | 70 | 12 | PVC | 130 | 2,083.03 | 5.91 | 0.01 |
| P-2 | 187 | 8 | PVC | 130 | 807.36 | 5.15 | 0.012 |
| P-3 | 187 | 8 | PVC | 130 | 800.09 | 5.11 | 0.012 |
| P-4 | 60 | 8 | PVC | 130 | 796.45 | 5.08 | 0.012 |
| P-11 | 87 | 8 | PVC | 130 | 748.59 | 4.78 | 0.011 |
| P-10 | 161 | 8 | PVC | 130 | 744.04 | 4.75 | 0.011 |
| P-9 | 159 | 8 | PVC | 130 | 738.59 | 4.71 | 0.01 |
| P-8(2) | 62 | 8 | PVC | 130 | 734.95 | 4.69 | 0.01 |
| P-8(1) | 100 | 8 | PVC | 130 | 718.11 | 4.58 | 0.01 |
| P-7 | 161 | 8 | PVC | 130 | 713.56 | 4.55 | 0.01 |
| P-5 | 126 | 12 | PVC | 130 | 1,510.01 | 4.28 | 0.005 |
| P-6 | 183 | 12 | PVC | 130 | 1,504.55 | 4.27 | 0.005 |
| P-14 | 166 | 12 | PVC | 130 | 1,334.44 | 3.79 | 0.004 |
| P-15 | 164 | 12 | PVC | 130 | 1,330.80 | 3.78 | 0.004 |
| P-16 | 168 | 12 | PVC | 130 | 1,327.16 | 3.76 | 0.004 |
| P-17 | 18 | 12 | PVC | 150 | 1,322.61 | 3.75 | 0.003 |
| P-1 | 756 | 8 | PVC | 130 | 515.25 | 3.29 | 0.005 |

| Potable - Maximum Day + Fire Flow (J-6) and Irrigation (Junction) | | | | |
|---|---|---|---|---|
| Label | Elevation (ft) | Demand (gpm) | Hydraulic Grade (ft) | Pressure (psi) |
| J-11 | 4,911.49 | 0 | 5,109.59 | 86 |
| J-12 | 4,910.35 | 2.73 | 5,110.28 | 86 |
| J-1 | 4,909.79 | 0 | 5,107.39 | 85 |
| J-13 | 4,912.40 | 3.64 | 5,108.88 | 85 |
| J-14 | 4,911.18 | 3.64 | 5,108.17 | 85 |
| J-15 | 4,909.92 | 4.55 | 5,107.45 | 85 |
| J-2 | 4,912.09 | 7.28 | 5,105.10 | 84 |
| J-10 | 4,913.37 | 4.55 | 5,108.66 | 84 |
| J-9 | 4,916.81 | 5.46 | 5,106.96 | 82 |
| J-3 | 4,915.18 | 3.64 | 5,102.83 | 81 |
| J-4 | 4,916.20 | 0 | 5,102.11 | 80 |
| J-7 | 4,919.15 | 4.55 | 5,103.68 | 80 |
| J-8 | 4,920.01 | 3.64 | 5,105.31 | 80 |
| J-18 | 4,919.68 | 16.84 | 5,104.67 | 80 |
| J-5 | 4,919.81 | 5.46 | 5,101.42 | 79 |
| J-6 | 4,924.84 | 1,504.55 | 5,100.43 | 76 |

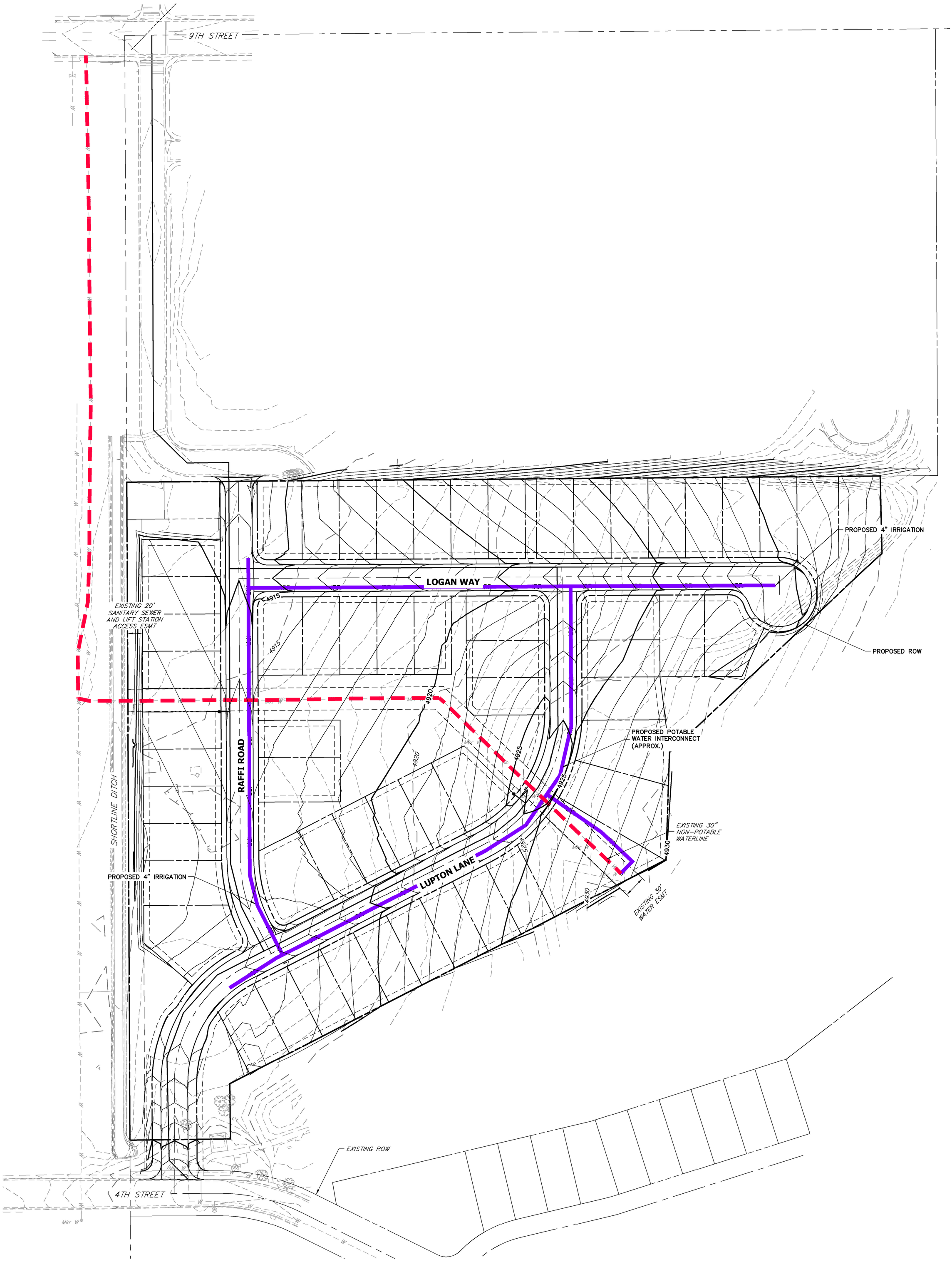
| Potable - Maximum Day + Fire Flow (J-8) and Irrigation (Pipe) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Label | Length (ft) | Diameter (in) | Material | Hazen-Williams C | Flow (Absolute) (gpm) | Velocity (Maximum) (ft/s) | Headloss Gradient (ft/ft) |
| P-11 | 87 | 8 | PVC | 130 | 957.86 | 6.11 | 0.017 |
| P-10 | 161 | 8 | PVC | 130 | 953.31 | 6.08 | 0.017 |
| P-9 | 159 | 8 | PVC | 130 | 947.86 | 6.05 | 0.017 |
| P-13 | 307 | 12 | PVC | 130 | 2,114.37 | 6 | 0.01 |
| P-12 | 70 | 12 | PVC | 130 | 2,111.64 | 5.99 | 0.01 |
| P-2 | 187 | 8 | PVC | 130 | 598.1 | 3.82 | 0.007 |
| P-3 | 187 | 8 | PVC | 130 | 590.82 | 3.77 | 0.007 |
| P-4 | 60 | 8 | PVC | 130 | 587.18 | 3.75 | 0.007 |
| P-7 | 161 | 8 | PVC | 130 | 577.17 | 3.68 | 0.007 |
| P-8(1) | 100 | 8 | PVC | 130 | 572.62 | 3.65 | 0.007 |
| P-8(2) | 62 | 8 | PVC | 130 | 555.78 | 3.55 | 0.006 |
| P-1 | 756 | 8 | PVC | 130 | 543.86 | 3.47 | 0.006 |
| P-14 | 166 | 12 | PVC | 130 | 1,153.78 | 3.27 | 0.003 |
| P-15 | 164 | 12 | PVC | 130 | 1,150.14 | 3.26 | 0.003 |
| P-16 | 168 | 12 | PVC | 130 | 1,146.50 | 3.25 | 0.003 |
| P-17 | 18 | 12 | PVC | 150 | 1,141.95 | 3.24 | 0.002 |
| P-5 | 126 | 12 | PVC | 130 | 10.01 | 0.03 | 0 |
| P-6 | 183 | 12 | PVC | 130 | 4.55 | 0.01 | 0 |

| Potable - Maximum Day + Fire Flow (J-8) and Irrigation (Junction) | | | | |
|---|---|---|---|---|
| Label | Elevation (ft) | Demand (gpm) | Hydraulic Grade (ft) | Pressure (psi) |
| J-1 | 4,909.79 | 0 | 5,107.82 | 86 |
| J-11 | 4,911.49 | 0 | 5,109.50 | 86 |
| J-12 | 4,910.35 | 2.73 | 5,110.20 | 86 |
| J-15 | 4,909.92 | 4.55 | 5,107.86 | 86 |
| J-13 | 4,912.40 | 3.64 | 5,108.95 | 85 |
| J-14 | 4,911.18 | 3.64 | 5,108.41 | 85 |
| J-2 | 4,912.09 | 7.28 | 5,106.50 | 84 |
| J-10 | 4,913.37 | 4.55 | 5,108.02 | 84 |
| J-3 | 4,915.18 | 3.64 | 5,105.21 | 82 |
| J-4 | 4,916.20 | 0 | 5,104.80 | 82 |
| J-9 | 4,916.81 | 5.46 | 5,105.33 | 82 |
| J-5 | 4,919.81 | 5.46 | 5,104.80 | 80 |
| J-7 | 4,919.15 | 4.55 | 5,103.74 | 80 |
| J-8 | 4,920.01 | 1,503.64 | 5,102.71 | 79 |
| J-18 | 4,919.68 | 16.84 | 5,103.09 | 79 |
| J-6 | 4,924.84 | 4.55 | 5,104.80 | 78 |

# Appendix C
# Non-Potable Water System Demands, Model Map, and WaterCAD Map & Results

# COYOTE CREEK FILING NO. 4

## NON-POTABLE WATER SYSTEM MAP




## COLOR CODING LEGEND

4" ø PROPOSED IRRIGATION MAIN

30" ø PROPOSED IRRIGATION MAIN

60 30 0 60 120

ORIGINAL SCALE: 1" = 60'

NON-POTABLE WATER
SYSTEM MAP
COYOTE CREEK FILING NO. 4
JOB NO. 1609300
2021-11-17
SHEET 1 OF 1


J·R ENGINEERING
A Westrian Company

Centennial 303-740-9393 • Colorado Springs 719-593-2593
Fort Collins 970-491-9888 • www.jrengineering.com

| | |
|---|---|
| Project Name | Coyote Creek Filing No. 4 |
| Project Number | 16093.00 |
| Date | 11/8/2021 |
| By | SWW |

| Fort Lupton Criteria | |
|---|---|
| | Non-Potable |
| Avg Day Demand (gpm/acre)* | 1.55 |
| Max Day Factor | 2.5 |
| Max Hour Factor | 4 |

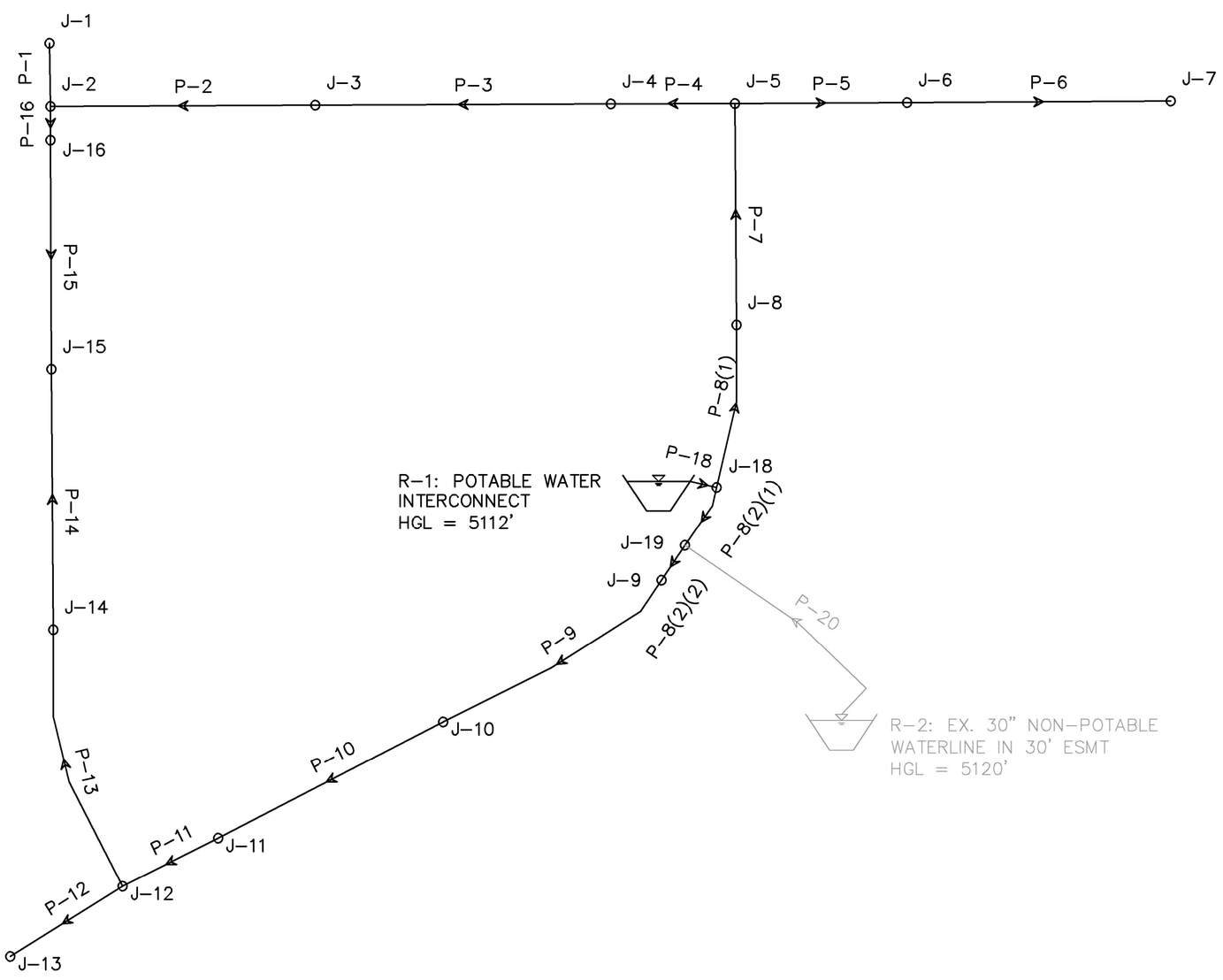
*From the SACWSD Design & Construction Standards

| Non-Potable Water Demand | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Junction | Surface Elevation | TOP Elevation | No. DU Served | No. 50'x105' Lots | No. 60'x105' Lots** | Park Area (acres) | Total Irrigated Area (acre) | Demand (gpm) | | |
| | | | 45% Irrigated | | | 75% Irrigated | | Average Day | Max Day | Peak Hour |
| J-3 | 4916.97 | 4911.97 | 8 | 8 | 0 | | 0.434 | 0.67 | 1.68 | 2.69 |
| J-4 | 4920.06 | 4915.06 | 4 | 3 | 1 | | 0.228 | 0.35 | 0.88 | 1.41 |
| J-6 | 4924.70 | 4919.70 | 6 | 4 | 2 | | 0.347 | 0.54 | 1.35 | 2.15 |
| J-7 | 4929.42 | 4924.42 | 5 | 2 | 3.6 | | 0.343 | 0.53 | 1.33 | 2.13 |
| J-8 | 4924.09 | 4919.09 | 5 | 3 | 2.4 | | 0.319 | 0.49 | 1.24 | 1.98 |
| J-9 | 4924.99 | 4919.99 | 4 | 1 | 4.2 | | 0.328 | 0.51 | 1.27 | 2.03 |
| J-10 | 4921.79 | 4916.79 | 6 | 6 | 0 | | 0.325 | 0.50 | 1.26 | 2.02 |
| J-11 | 4918.35 | 4913.35 | 5 | 4 | 1.3 | | 0.302 | 0.47 | 1.17 | 1.87 |
| J-13 | 4915.35 | 4910.35 | 3 | 1 | 2.6 | | 0.223 | 0.35 | 0.87 | 1.39 |
| J-14 | 4917.28 | 4912.28 | 4 | 2 | 2 | | 0.239 | 0.37 | 0.92 | 1.48 |
| J-15 | 4916.07 | 4911.07 | 4 | 4 | 0 | 1 | 0.967 | 1.50 | 3.75 | 6.00 |
| J-16 | 4914.98 | 4909.98 | 5 | 3 | 2 | | 0.293 | 0.45 | 1.13 | 1.82 |
| Total | | | 59 | 41 | 21 | 1 | 4.35 | 6.74 | 16.84 | 26.95 |

**Includes lots that are larger than 60'x105', expressed as a multiple of 60'x105' lots based on lot area

# COYOTE CREEK FILING NO. 4

**NON-POTABLE WATERCAD MAP**
**WITH POTABLE WATER INTERCONNECT**




NON–POTABLE WATERCAD MAP
COYOTE CREEK FILING NO. 4
JOB NO. 1609300
2021–11–17
SHEET 1 OF 2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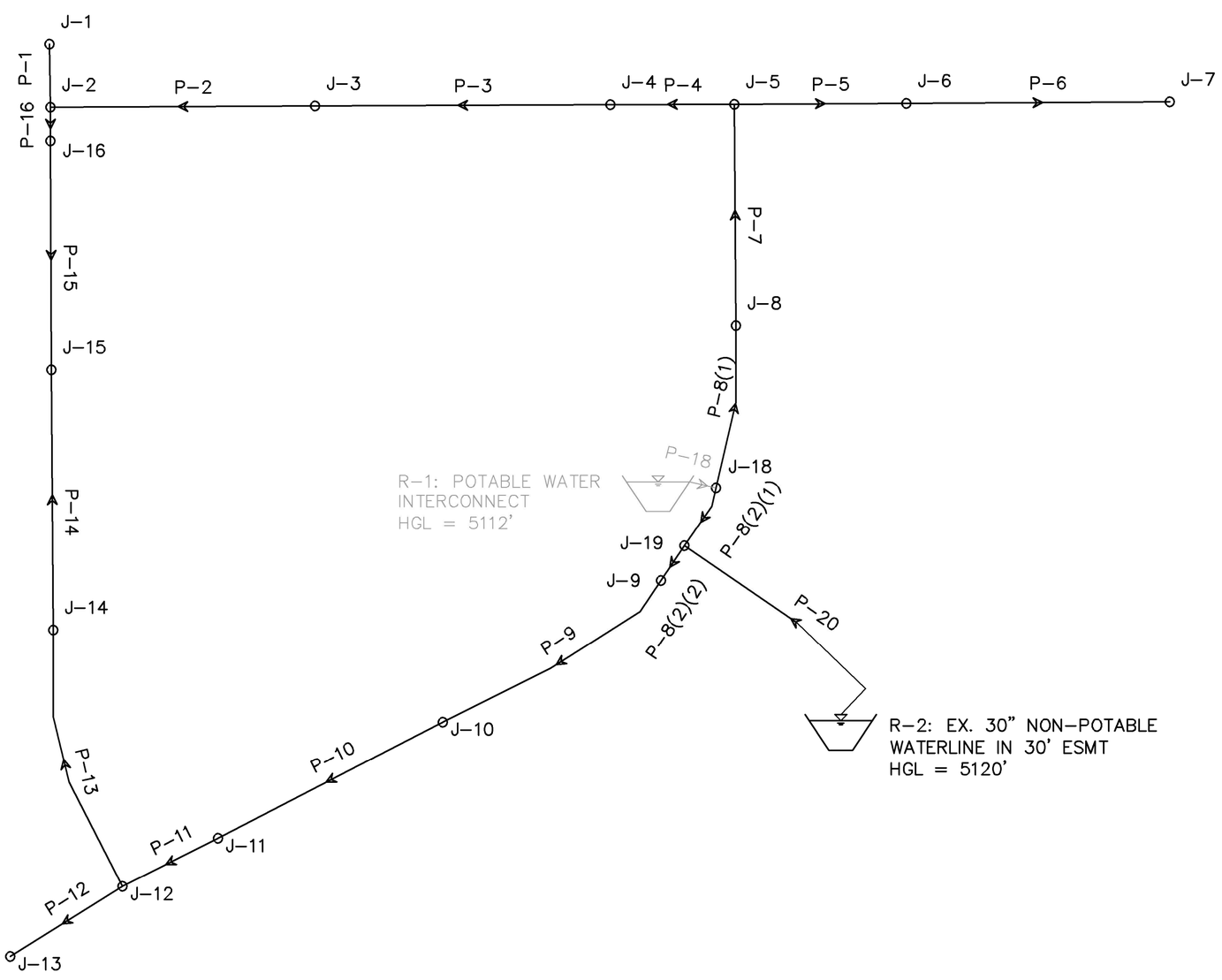
# COYOTE CREEK FILING NO. 4

## NON-POTABLE WATERCAD MAP

## WITH CONNECTION TO EXISTING 30" NON-POTABLE WATERLINE IN 30' ESMT




NON–POTABLE WATERCAD MAP
COYOTE CREEK FILING NO. 4
JOB NO. 1609300
2021–11–17
SHEET 2 OF 2

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| Irrigation w/ Potable Interconnect - Maximum Hour (Pipe) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Label | Length (ft) | Diameter (in) | Material | Hazen-Williams C | Flow (Absolute) (gpm) | Velocity (Maximum) (ft/s) | Headloss Gradient (ft/ft) |
| P-18 | 17 | 4 | PVC | 130 | 26.97 | 0.69 | 0.001 |
| P-8(1) | 104 | 4 | PVC | 130 | 14.05 | 0.36 | 0 |
| P-8(2)(1) | 42 | 4 | PVC | 130 | 12.92 | 0.33 | 0 |
| P-8(2)(2) | 27 | 4 | PVC | 130 | 12.92 | 0.33 | 0 |
| P-7 | 140 | 4 | PVC | 130 | 12.07 | 0.31 | 0 |
| P-9 | 167 | 4 | PVC | 130 | 10.89 | 0.28 | 0 |
| P-10 | 160 | 4 | PVC | 130 | 8.87 | 0.23 | 0 |
| P-4 | 78 | 4 | PVC | 130 | 7.79 | 0.2 | 0 |
| P-11 | 68 | 4 | PVC | 130 | 7 | 0.18 | 0 |
| P-3 | 187 | 4 | PVC | 130 | 6.38 | 0.16 | 0 |
| P-13 | 172 | 4 | PVC | 130 | 5.61 | 0.14 | 0 |
| P-5 | 109 | 4 | PVC | 130 | 4.28 | 0.11 | 0 |
| P-14 | 165 | 4 | PVC | 130 | 4.13 | 0.11 | 0 |
| P-2 | 167 | 4 | PVC | 130 | 3.69 | 0.09 | 0 |
| P-16 | 21 | 4 | PVC | 130 | 3.69 | 0.09 | 0 |
| P-6 | 167 | 4 | PVC | 130 | 2.13 | 0.05 | 0 |
| P-15 | 145 | 4 | PVC | 130 | 1.87 | 0.05 | 0 |
| P-12 | 84 | 4 | PVC | 130 | 1.39 | 0.04 | 0 |
| P-1 | 40 | 4 | PVC | 130 | 0 | 0 | 0 |
| P-20 | 169 | 4 | PVC | 130 | (N/A) | (N/A) | (N/A) |

| Irrigation w/ Potable Interconnect - Maximum Hour (Junction) | | | | |
|---|---|---|---|---|
| Label | Elevation (ft) | Demand (gpm) | Hydraulic Grade (ft) | Pressure (psi) |
| J-1 | 4,909.51 | 0 | 5,112.22 | 88 |
| J-2 | 4,909.82 | 0 | 5,112.22 | 88 |
| J-3 | 4,911.97 | 2.69 | 5,112.22 | 87 |
| J-12 | 4,911.90 | 0 | 5,112.23 | 87 |
| J-13 | 4,910.35 | 1.39 | 5,112.23 | 87 |
| J-14 | 4,912.28 | 1.48 | 5,112.22 | 87 |
| J-15 | 4,911.07 | 6 | 5,112.22 | 87 |
| J-16 | 4,909.98 | 1.82 | 5,112.22 | 87 |
| J-11 | 4,913.35 | 1.87 | 5,112.23 | 86 |
| J-4 | 4,915.06 | 1.41 | 5,112.23 | 85 |
| J-5 | 4,916.47 | 0 | 5,112.24 | 85 |
| J-10 | 4,916.79 | 2.02 | 5,112.25 | 85 |
| J-8 | 4,919.09 | 1.98 | 5,112.26 | 84 |
| J-6 | 4,919.70 | 2.15 | 5,112.23 | 83 |
| J-9 | 4,919.99 | 2.03 | 5,112.27 | 83 |
| J-18 | 4,920.36 | 0 | 5,112.28 | 83 |
| J-19 | 4,921.74 | 0 | 5,112.27 | 82 |
| J-7 | 4,924.42 | 2.13 | 5,112.23 | 81 |

| Irrigation w/ Potable Interconnect - Maximum Day (Pipe) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Label | Length (ft) | Diameter (in) | Material | Hazen-Williams C | Flow (Absolute) (gpm) | Velocity (Maximum) (ft/s) | Headloss Gradient (ft/ft) |
| P-18 | 17 | 4 | PVC | 130 | 16.85 | 0.43 | 0 |
| P-8(1) | 104 | 4 | PVC | 130 | 8.78 | 0.22 | 0 |
| P-8(2)(1) | 42 | 4 | PVC | 130 | 8.07 | 0.21 | 0 |
| P-8(2)(2) | 27 | 4 | PVC | 130 | 8.07 | 0.21 | 0 |
| P-7 | 140 | 4 | PVC | 130 | 7.54 | 0.19 | 0 |
| P-9 | 167 | 4 | PVC | 130 | 6.8 | 0.17 | 0 |
| P-10 | 160 | 4 | PVC | 130 | 5.54 | 0.14 | 0 |
| P-4 | 78 | 4 | PVC | 130 | 4.86 | 0.12 | 0 |
| P-11 | 68 | 4 | PVC | 130 | 4.37 | 0.11 | 0 |
| P-3 | 187 | 4 | PVC | 130 | 3.98 | 0.1 | 0 |
| P-13 | 172 | 4 | PVC | 130 | 3.5 | 0.09 | 0 |
| P-5 | 109 | 4 | PVC | 130 | 2.68 | 0.07 | 0 |
| P-14 | 165 | 4 | PVC | 130 | 2.58 | 0.07 | 0 |
| P-2 | 167 | 4 | PVC | 130 | 2.3 | 0.06 | 0 |
| P-16 | 21 | 4 | PVC | 130 | 2.3 | 0.06 | 0 |
| P-6 | 167 | 4 | PVC | 130 | 1.33 | 0.03 | 0 |
| P-15 | 145 | 4 | PVC | 130 | 1.17 | 0.03 | 0 |
| P-12 | 84 | 4 | PVC | 130 | 0.87 | 0.02 | 0 |
| P-1 | 40 | 4 | PVC | 130 | 0 | 0 | 0 |
| P-20 | 169 | 4 | PVC | 130 | (N/A) | (N/A) | (N/A) |

| Irrigation w/ Potable Interconnect - Maximum Day (Junction) | | | | |
|---|---|---|---|---|
| Label | Elevation (ft) | Demand (gpm) | Hydraulic Grade (ft) | Pressure (psi) |
| J-1 | 4,909.51 | 0 | 5,112.26 | 88 |
| J-2 | 4,909.82 | 0 | 5,112.26 | 88 |
| J-16 | 4,909.98 | 1.13 | 5,112.26 | 88 |
| J-3 | 4,911.97 | 1.68 | 5,112.26 | 87 |
| J-12 | 4,911.90 | 0 | 5,112.26 | 87 |
| J-13 | 4,910.35 | 0.87 | 5,112.26 | 87 |
| J-14 | 4,912.28 | 0.92 | 5,112.26 | 87 |
| J-15 | 4,911.07 | 3.75 | 5,112.26 | 87 |
| J-11 | 4,913.35 | 1.17 | 5,112.27 | 86 |
| J-4 | 4,915.06 | 0.88 | 5,112.27 | 85 |
| J-5 | 4,916.47 | 0 | 5,112.27 | 85 |
| J-10 | 4,916.79 | 1.26 | 5,112.27 | 85 |
| J-8 | 4,919.09 | 1.24 | 5,112.28 | 84 |
| J-6 | 4,919.70 | 1.35 | 5,112.27 | 83 |
| J-9 | 4,919.99 | 1.27 | 5,112.28 | 83 |
| J-18 | 4,920.36 | 0 | 5,112.29 | 83 |
| J-19 | 4,921.74 | 0 | 5,112.28 | 82 |
| J-7 | 4,924.42 | 1.33 | 5,112.27 | 81 |

| Irrigation w/ Connection to Ex. 30" - Maximum Hour (Pipe) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Label | Length (ft) | Diameter (in) | Material | Hazen-Williams C | Flow (Absolute) (gpm) | Velocity (Maximum) (ft/s) | Headloss Gradient (ft/ft) |
| P-20 | 169 | 4 | PVC | 130 | 26.97 | 0.69 | 0.001 |
| P-8(2)(2) | 27 | 4 | PVC | 130 | 13.56 | 0.35 | 0 |
| P-8(1) | 104 | 4 | PVC | 130 | 13.41 | 0.34 | 0 |
| P-8(2)(1) | 42 | 4 | PVC | 130 | 13.41 | 0.34 | 0 |
| P-7 | 140 | 4 | PVC | 130 | 11.43 | 0.29 | 0 |
| P-9 | 167 | 4 | PVC | 130 | 11.53 | 0.29 | 0 |
| P-10 | 160 | 4 | PVC | 130 | 9.51 | 0.24 | 0 |
| P-11 | 68 | 4 | PVC | 130 | 7.64 | 0.2 | 0 |
| P-4 | 78 | 4 | PVC | 130 | 7.15 | 0.18 | 0 |
| P-13 | 172 | 4 | PVC | 130 | 6.25 | 0.16 | 0 |
| P-3 | 187 | 4 | PVC | 130 | 5.74 | 0.15 | 0 |
| P-14 | 165 | 4 | PVC | 130 | 4.77 | 0.12 | 0 |
| P-5 | 109 | 4 | PVC | 130 | 4.28 | 0.11 | 0 |
| P-2 | 167 | 4 | PVC | 130 | 3.05 | 0.08 | 0 |
| P-16 | 21 | 4 | PVC | 130 | 3.05 | 0.08 | 0 |
| P-6 | 167 | 4 | PVC | 130 | 2.13 | 0.05 | 0 |
| P-12 | 84 | 4 | PVC | 130 | 1.39 | 0.04 | 0 |
| P-15 | 145 | 4 | PVC | 130 | 1.23 | 0.03 | 0 |
| P-1 | 40 | 4 | PVC | 130 | 0 | 0 | 0 |
| P-18 | 17 | 4 | PVC | 130 | (N/A) | (N/A) | (N/A) |

| Irrigation w/ Connection to Ex. 30" - Maximum Hour (Junction) | | | | |
|---|---|---|---|---|
| Label | Elevation (ft) | Demand (gpm) | Hydraulic Grade (ft) | Pressure (psi) |
| J-1 | 4,909.51 | 0 | 5,119.83 | 91 |
| J-2 | 4,909.82 | 0 | 5,119.83 | 91 |
| J-13 | 4,910.35 | 1.39 | 5,119.84 | 91 |
| J-16 | 4,909.98 | 1.82 | 5,119.83 | 91 |
| J-3 | 4,911.97 | 2.69 | 5,119.83 | 90 |
| J-12 | 4,911.90 | 0 | 5,119.84 | 90 |
| J-14 | 4,912.28 | 1.48 | 5,119.83 | 90 |
| J-15 | 4,911.07 | 6 | 5,119.83 | 90 |
| J-4 | 4,915.06 | 1.41 | 5,119.84 | 89 |
| J-11 | 4,913.35 | 1.87 | 5,119.84 | 89 |
| J-5 | 4,916.47 | 0 | 5,119.84 | 88 |
| J-10 | 4,916.79 | 2.02 | 5,119.86 | 88 |
| J-6 | 4,919.70 | 2.15 | 5,119.84 | 87 |
| J-8 | 4,919.09 | 1.98 | 5,119.86 | 87 |
| J-9 | 4,919.99 | 2.03 | 5,119.88 | 86 |
| J-18 | 4,920.36 | 0 | 5,119.88 | 86 |
| J-19 | 4,921.74 | 0 | 5,119.89 | 86 |
| J-7 | 4,924.42 | 2.13 | 5,119.84 | 85 |

| Irrigation w/ Connection to Ex. 30" - Maximum Day (Pipe) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Label | Length (ft) | Diameter (in) | Material | Hazen-Williams C | Flow (Absolute) (gpm) | Velocity (Maximum) (ft/s) | Headloss Gradient (ft/ft) |
| P-20 | 169 | 4 | PVC | 130 | 16.85 | 0.43 | 0 |
| P-8(2)(2) | 27 | 4 | PVC | 130 | 8.47 | 0.22 | 0 |
| P-8(1) | 104 | 4 | PVC | 130 | 8.38 | 0.21 | 0 |
| P-8(2)(1) | 42 | 4 | PVC | 130 | 8.38 | 0.21 | 0 |
| P-7 | 140 | 4 | PVC | 130 | 7.14 | 0.18 | 0 |
| P-9 | 167 | 4 | PVC | 130 | 7.2 | 0.18 | 0 |
| P-10 | 160 | 4 | PVC | 130 | 5.94 | 0.15 | 0 |
| P-11 | 68 | 4 | PVC | 130 | 4.77 | 0.12 | 0 |
| P-4 | 78 | 4 | PVC | 130 | 4.46 | 0.11 | 0 |
| P-13 | 172 | 4 | PVC | 130 | 3.9 | 0.1 | 0 |
| P-3 | 187 | 4 | PVC | 130 | 3.58 | 0.09 | 0 |
| P-14 | 165 | 4 | PVC | 130 | 2.98 | 0.08 | 0 |
| P-5 | 109 | 4 | PVC | 130 | 2.68 | 0.07 | 0 |
| P-2 | 167 | 4 | PVC | 130 | 1.9 | 0.05 | 0 |
| P-16 | 21 | 4 | PVC | 130 | 1.9 | 0.05 | 0 |
| P-6 | 167 | 4 | PVC | 130 | 1.33 | 0.03 | 0 |
| P-12 | 84 | 4 | PVC | 130 | 0.87 | 0.02 | 0 |
| P-15 | 145 | 4 | PVC | 130 | 0.77 | 0.02 | 0 |
| P-1 | 40 | 4 | PVC | 130 | 0 | 0 | 0 |
| P-18 | 17 | 4 | PVC | 130 | (N/A) | (N/A) | (N/A) |

| Irrigation w/ Connection to Ex. 30" - Maximum Day (Junction) | | | | |
|---|---|---|---|---|
| Label | Elevation (ft) | Demand (gpm) | Hydraulic Grade (ft) | Pressure (psi) |
| J-1 | 4,909.51 | 0 | 5,119.93 | 91 |
| J-2 | 4,909.82 | 0 | 5,119.93 | 91 |
| J-13 | 4,910.35 | 0.87 | 5,119.93 | 91 |
| J-16 | 4,909.98 | 1.13 | 5,119.93 | 91 |
| J-3 | 4,911.97 | 1.68 | 5,119.93 | 90 |
| J-12 | 4,911.90 | 0 | 5,119.93 | 90 |
| J-14 | 4,912.28 | 0.92 | 5,119.93 | 90 |
| J-15 | 4,911.07 | 3.75 | 5,119.93 | 90 |
| J-4 | 4,915.06 | 0.88 | 5,119.93 | 89 |
| J-11 | 4,913.35 | 1.17 | 5,119.94 | 89 |
| J-5 | 4,916.47 | 0 | 5,119.93 | 88 |
| J-10 | 4,916.79 | 1.26 | 5,119.94 | 88 |
| J-6 | 4,919.70 | 1.35 | 5,119.93 | 87 |
| J-8 | 4,919.09 | 1.24 | 5,119.94 | 87 |
| J-9 | 4,919.99 | 1.27 | 5,119.95 | 87 |
| J-18 | 4,920.36 | 0 | 5,119.95 | 86 |
| J-19 | 4,921.74 | 0 | 5,119.95 | 86 |
| J-7 | 4,924.42 | 1.33 | 5,119.93 | 85 |

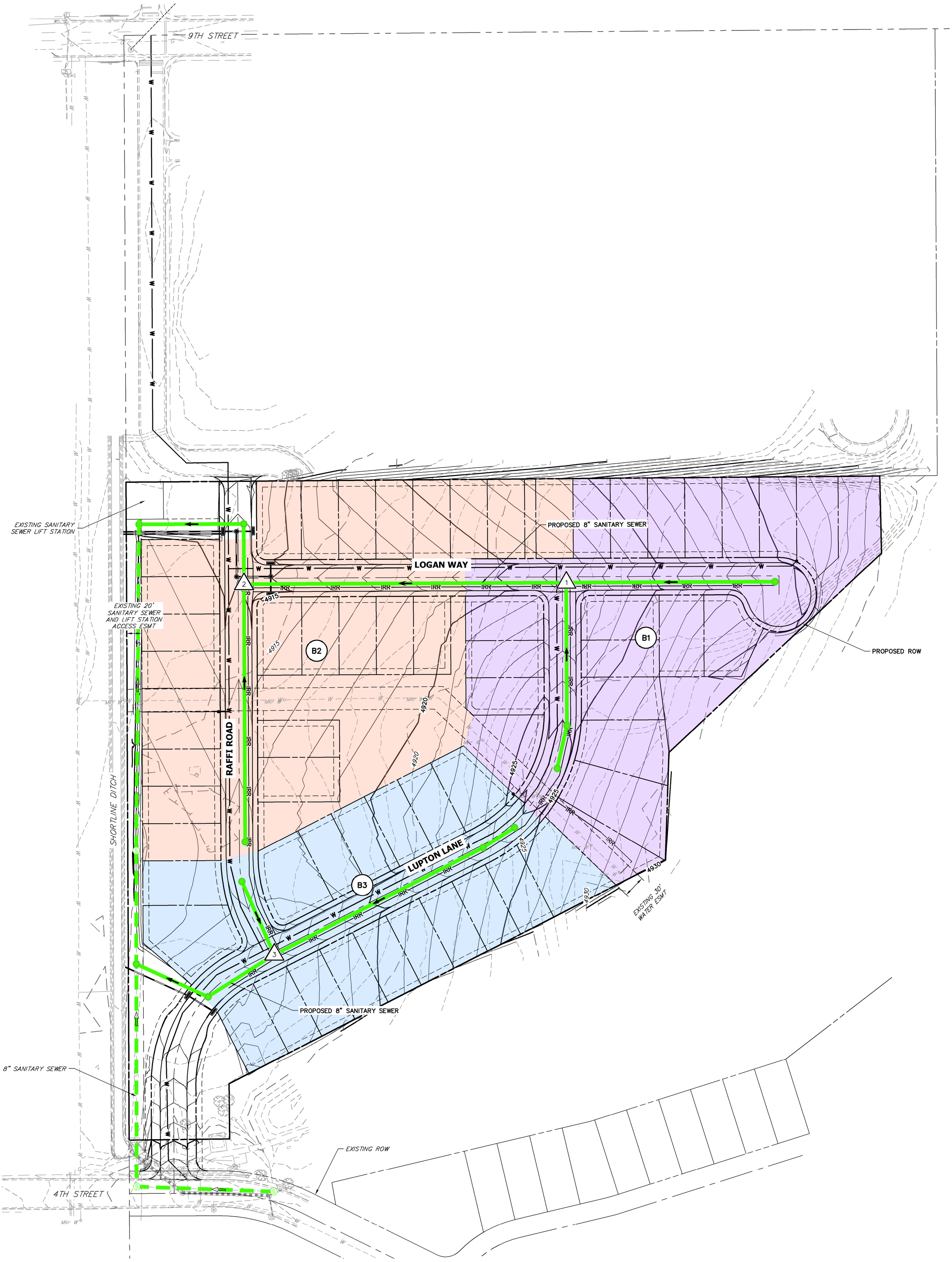
| Irrigation w/ Connection to Ex. 30", Minimum System Pressure - Maximum Hour (Pipe) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Label | Length (ft) | Diameter (in) | Material | Hazen-Williams C | Flow (Absolute) (gpm) | Velocity (Maximum) (ft/s) | Headloss Gradient (ft/ft) |
| P-20 | 169 | 4 | PVC | 130 | 26.97 | 0.69 | 0.001 |
| P-8(2)(2) | 27 | 4 | PVC | 130 | 13.56 | 0.35 | 0 |
| P-8(1) | 104 | 4 | PVC | 130 | 13.41 | 0.34 | 0 |
| P-8(2)(1) | 42 | 4 | PVC | 130 | 13.41 | 0.34 | 0 |
| P-9 | 167 | 4 | PVC | 130 | 11.53 | 0.29 | 0 |
| P-7 | 140 | 4 | PVC | 130 | 11.43 | 0.29 | 0 |
| P-10 | 160 | 4 | PVC | 130 | 9.51 | 0.24 | 0 |
| P-11 | 68 | 4 | PVC | 130 | 7.64 | 0.2 | 0 |
| P-4 | 78 | 4 | PVC | 130 | 7.15 | 0.18 | 0 |
| P-13 | 172 | 4 | PVC | 130 | 6.25 | 0.16 | 0 |
| P-3 | 187 | 4 | PVC | 130 | 5.74 | 0.15 | 0 |
| P-14 | 165 | 4 | PVC | 130 | 4.77 | 0.12 | 0 |
| P-5 | 109 | 4 | PVC | 130 | 4.28 | 0.11 | 0 |
| P-2 | 167 | 4 | PVC | 130 | 3.05 | 0.08 | 0 |
| P-16 | 21 | 4 | PVC | 130 | 3.05 | 0.08 | 0 |
| P-6 | 167 | 4 | PVC | 130 | 2.13 | 0.05 | 0 |
| P-12 | 84 | 4 | PVC | 130 | 1.39 | 0.04 | 0 |
| P-15 | 145 | 4 | PVC | 130 | 1.23 | 0.03 | 0 |
| P-1 | 40 | 4 | PVC | 130 | 0 | 0 | 0 |
| P-18 | 17 | 4 | PVC | 130 | (N/A) | (N/A) | (N/A) |

| Irrigation w/ Connection to Ex. 30", Minimum System Pressure - Maximum Day (Junction) | | | | |
|---|---|---|---|---|
| Label | Elevation (ft) | Demand (gpm) | Hydraulic Grade (ft) | Pressure (psi) |
| J-15 | 4,911.07 | 6 | 5,039.83 | 56 |
| J-13 | 4,910.35 | 1.39 | 5,039.84 | 56 |
| J-16 | 4,909.98 | 1.82 | 5,039.83 | 56 |
| J-2 | 4,909.82 | 0 | 5,039.83 | 56 |
| J-1 | 4,909.51 | 0 | 5,039.83 | 56 |
| J-11 | 4,913.35 | 1.87 | 5,039.84 | 55 |
| J-14 | 4,912.28 | 1.48 | 5,039.83 | 55 |
| J-3 | 4,911.97 | 2.69 | 5,039.83 | 55 |
| J-12 | 4,911.90 | 0 | 5,039.84 | 55 |
| J-4 | 4,915.06 | 1.41 | 5,039.84 | 54 |
| J-10 | 4,916.79 | 2.02 | 5,039.86 | 53 |
| J-5 | 4,916.47 | 0 | 5,039.84 | 53 |
| J-18 | 4,920.36 | 0 | 5,039.88 | 52 |
| J-9 | 4,919.99 | 2.03 | 5,039.88 | 52 |
| J-6 | 4,919.70 | 2.15 | 5,039.84 | 52 |
| J-8 | 4,919.09 | 1.98 | 5,039.86 | 52 |
| J-19 | 4,921.74 | 0 | 5,039.89 | 51 |
| J-7 | 4,924.42 | 2.13 | 5,039.84 | 50 |

# Appendix C
# Sanitary Sewer System Loading, Basin Map, and FlowMaster Results

# COYOTE CREEK FILING NO. 4

## SANITARY SEWER SYSTEM MAP




## COLOR CODING LEGEND

- 8" ø PROPOSED SANITARY SEWER MAIN
- 12" ø PROPOSED SANITARY SEWER MAIN
- 8" ø EXISTING SANITARY SEWER MAIN
- PROPOSED SANITARY DRAINAGE ARROW
- EXISTING SANITARY DRAINAGE ARROW
- 1 — DESIGN POINT
- B1 — SANITARY BASIN DESIGNATION

N

60 30 0 60 120

ORIGINAL SCALE: 1" = 60'

SANITARY SEWER SYSTEM MAP
COYOTE CREEK FILING NO. 4
JOB NO. 1609300
2021-11-17
SHEET 1 OF 1


J·R ENGINEERING
A Westrian Company

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| | |
|---|---|
| Project Name | Coyote Creek Filing No. 4 |
| Project Number | 16093.00 |
| Date | 11/8/2021 |
| By | SWW |

| Fort Lupton Criteria | |
|---|---|
| Residential Population Density (people/unit) | 2.90 |
| Average Daily Flow (gpd/person) | 70 |
| Peak Factor | 3.0 |
| Infiltration and Inflow Rate (gpad) | 1000 |

**Onsite Sanitary Sewer Loadings**

| Basin | Land Use | Acres | No. DU's | Flow Rate (gpm) | | | |
|---|---|---|---|---|---|---|---|
| | | | | Average Day | Peak Day | Infiltration & Inflow | PDF + I&I |
| B1 | Single-Family Residential | 4.15 | 18 | 2.54 | 7.61 | 2.88 | 10.49 |
| B2 | Single-Family Residential | 4.63 | 23 | 3.24 | 9.73 | 3.21 | 12.94 |
| B3 | Single-Family Residential | 3.22 | 18 | 2.54 | 7.61 | 2.23 | 9.85 |
| Total | PA-4 | 13.25 | 59 | 8.32 | 24.95 | | 33.28 |

# Worksheet for DP-1

| Project Description | |
|---|---|
| Friction Method | Manning Formula |
| Solve For | Normal Depth |

| Input Data | |
|---|---|
| Roughness Coefficient | 0.015 |
| Channel Slope | 0.028 ft/ft |
| Diameter | 8.0 in |
| Discharge | 0.02 cfs |

| Results | |
|---|---|
| Normal Depth | 0.6 in |
| Flow Area | 0.0 ft² |
| Wetted Perimeter | 0.4 ft |
| Hydraulic Radius | 0.4 in |
| Top Width | 0.36 ft |
| Critical Depth | 0.8 in |
| Percent Full | 8.1 % |
| Critical Slope | 0.010 ft/ft |
| Velocity | 1.76 ft/s |
| Velocity Head | 0.05 ft |
| Specific Energy | 0.10 ft |
| Froude Number | 1.619 |
| Maximum Discharge | 1.87 cfs |
| Discharge Full | 1.74 cfs |
| Slope Full | 0.000 ft/ft |
| Flow Type | Supercritical |

| GVF Input Data | |
|---|---|
| Downstream Depth | 0.0 in |
| Length | 0.0 ft |
| Number Of Steps | 0 |

| GVF Output Data | |
|---|---|
| Upstream Depth | 0.0 in |
| Profile Description | N/A |
| Profile Headloss | 0.00 ft |
| Average End Depth Over Rise | 0.0 % |
| Normal Depth Over Rise | 8.1 % |
| Downstream Velocity | Infinity ft/s |
| Upstream Velocity | Infinity ft/s |
| Normal Depth | 0.6 in |
| Critical Depth | 0.8 in |
| Channel Slope | 0.028 ft/ft |
| Critical Slope | 0.010 ft/ft |

# Worksheet for DP-2

| Project Description | |
|---|---|
| Friction Method | Manning Formula |
| Solve For | Normal Depth |

| Input Data | |
|---|---|
| Roughness Coefficient | 0.015 |
| Channel Slope | 0.015 ft/ft |
| Diameter | 8.0 in |
| Discharge | 0.05 cfs |

| Results | |
|---|---|
| Normal Depth | 1.1 in |
| Flow Area | 0.0 ft² |
| Wetted Perimeter | 0.5 ft |
| Hydraulic Radius | 0.7 in |
| Top Width | 0.46 ft |
| Critical Depth | 1.2 in |
| Percent Full | 13.8 % |
| Critical Slope | 0.009 ft/ft |
| Velocity | 1.80 ft/s |
| Velocity Head | 0.05 ft |
| Specific Energy | 0.14 ft |
| Froude Number | 1.261 |
| Maximum Discharge | 1.38 cfs |
| Discharge Full | 1.28 cfs |
| Slope Full | 0.000 ft/ft |
| Flow Type | Supercritical |

| GVF Input Data | |
|---|---|
| Downstream Depth | 0.0 in |
| Length | 0.0 ft |
| Number Of Steps | 0 |

| GVF Output Data | |
|---|---|
| Upstream Depth | 0.0 in |
| Profile Description | N/A |
| Profile Headloss | 0.00 ft |
| Average End Depth Over Rise | 0.0 % |
| Normal Depth Over Rise | 13.8 % |
| Downstream Velocity | Infinity ft/s |
| Upstream Velocity | Infinity ft/s |
| Normal Depth | 1.1 in |
| Critical Depth | 1.2 in |
| Channel Slope | 0.015 ft/ft |
| Critical Slope | 0.009 ft/ft |

# Worksheet for DP-3

| Project Description | |
|---|---|
| Friction Method | Manning Formula |
| Solve For | Normal Depth |

| Input Data | |
|---|---|
| Roughness Coefficient | 0.015 |
| Channel Slope | 0.017 ft/ft |
| Diameter | 8.0 in |
| Discharge | 0.02 cfs |

| Results | |
|---|---|
| Normal Depth | 0.7 in |
| Flow Area | 0.0 ft² |
| Wetted Perimeter | 0.4 ft |
| Hydraulic Radius | 0.5 in |
| Top Width | 0.38 ft |
| Critical Depth | 0.8 in |
| Percent Full | 8.9 % |
| Critical Slope | 0.010 ft/ft |
| Velocity | 1.44 ft/s |
| Velocity Head | 0.03 ft |
| Specific Energy | 0.09 ft |
| Froude Number | 1.262 |
| Maximum Discharge | 1.45 cfs |
| Discharge Full | 1.35 cfs |
| Slope Full | 0.000 ft/ft |
| Flow Type | Supercritical |

| GVF Input Data | |
|---|---|
| Downstream Depth | 0.0 in |
| Length | 0.0 ft |
| Number Of Steps | 0 |

| GVF Output Data | |
|---|---|
| Upstream Depth | 0.0 in |
| Profile Description | N/A |
| Profile Headloss | 0.00 ft |
| Average End Depth Over Rise | 0.0 % |
| Normal Depth Over Rise | 8.9 % |
| Downstream Velocity | Infinity ft/s |
| Upstream Velocity | Infinity ft/s |
| Normal Depth | 0.7 in |
| Critical Depth | 0.8 in |
| Channel Slope | 0.017 ft/ft |
| Critical Slope | 0.010 ft/ft |

# COYOTE CREEK FILING NO. 4
# STORM WATER MANAGEMENT PLAN

November 2021

Prepared For:
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(Project No. 16093.00)

**CERTIFICATION**

**I hereby affirm that this Stormwater Management Plan for the Coyote Creek Filing No. 4 project was prepared under my direct supervision in accordance with the provisions of the Colorado Water Quality Control Act and the City of Fort Lupton. JR Engineering does not and will not assume liability for the implementation of the methods, requirements and standards set forth in this report.**

_____

Andrew Jonathan Hugill, P.E.
For and On Behalf of JR Engineering

# TABLE OF CONTENTS

1.0 SITE DESCRIPTION ..... 1
1.1. Introduction ..... 1
1.2. Current Conditions ..... 1
1.3. Nature and Purpose of Construction ..... 1
1.4. Wetlands and Receiving Waters ..... 2
1.5. Rainfall Erodibility & Erosion Sediment Control Methods ..... 2
1.6. Non-Stormwater Discharge ..... 3
2.0 STORMWATER MANAGEMENT CONTROLS ..... 4
2.1. Controls Overview ..... 4
2.2. Erosion and Sediment Controls ..... 4
2.2.1. Structural Practices (See drawings for locations) ..... 4
2.2.2. Non-Structural Practices (See drawings for locations) ..... 6
2.2.3. Other Controls (See drawings for location) ..... 7
2.3. SWMP Administrator ..... 7
2.4. Materials Management ..... 8
2.4.1. Potential Pollution Sources ..... 8
2.4.2. Pollution Prevention Measures ..... 8
2.5. Spill Management ..... 12
3.0 Dry Land Vegetation ..... 14
3.1. Soil and Surface Conditions ..... 14
3.2. Seed Mixes ..... 14
3.3. Mulches ..... 14
4.0 Detailed Sequence of Construction Activities ..... 14
5.0 Inspection and Maintenance ..... 15
5.1. Inspection and Maintenance Overview ..... 15
5.2. Final Stabilization and Long Term Stormwater Management ..... 17
6.0 CONCLUSION ..... 18
7.0 REFERENCES ..... 19

# APPENDICES

Appendix

A. Figures
    i. Vicinity Map
    ii. Soils Map
    iii. FIRM Map
B. Erosion Control Plans

# 1.0 SITE DESCRIPTION

## 1.1.Introduction

This report represents the Stormwater Management Plan for construction of Coyote Creek Filing No. 4. It was prepared to meet the regulatory requirements of the Colorado Department of Health, Water Quality Control Division in compliance with the provisions of the Colorado Water Quality Control Act, and the Federal Water Pollution Control Act.

This plan serves as a consolidated document for information on water quality protection for the subject site and areas immediately adjacent. It should also be noted that this plan is a living document that will need to be updated and maintained throughout the construction process. The intent of this plan is to provide the contractor a tool to consolidate records, logs, permits, applications, etc. as well as guidance on water quality protection. The plan incorporates elements that can be found in the contract plans and specifications as well as in the City of Fort Lupton Design Criteria Manual and Construction Specifications.

## 1.2.Current Conditions

Coyote Creek Filing No. 4 is a proposed single-family residential Planned Unit Development (PUD) located within Section 5, Township 1 North, Range 66 West of the 6$^{th}$ Principal Meridian, City of Fort Lupton, Weld County, Colorado.

The approximately 13-acre site is bounded by the Shortline Ditch regional channel to the west, Twombly Elementary School to the north, and Coyote Creek Golf Course to the southeast and 4$^{th}$ St. to the south. The site is located roughly 1,000 feet north of 1$^{st}$ St. and 600 feet south of 9$^{th}$ St. A vicinity map is included in Appendix A. The site is located within the Coyote Creek Subdivision with the Vincents East Subdivision directly to the west.

The site is composed of type B soils which are characterized as having a moderate infiltration rate when thoroughly wet. Approximately 90 percent of the site is covered in native grasses with the ground generally sloping from east to west between zero and 3 percent.

The proposed use for this site will be a residential subdivision composed of 59 single-family detached units with a local park. There is a 30” irrigation line bisecting the approximate center of the site from east to west.

## 1.3.Nature and Purpose of Construction

The proposed 4$^{th}$ Filing improvements will consist of 59 single family residential lots, including roadways, sidewalks, and utilities including, but not limited to, sanitary sewer, potable water, non-potable water and storm sewer.

### 1.4.Wetlands and Receiving Waters

The contributing area is composed of on-site basins. The contributing area has slopes of 0.5% to 5% with the whole range distributed throughout the entire site. All of the proposed 4th Filing development will be routed directly to a regional detention facility constructed by the City of Fort Lupton. The proposed system will consist of overland flow across proposed lots to various low points and a subsurface piped storm system. The site will be developed with access off of both 4$^{th}$ and 9$^{th}$ St. The site will consist of 59 single family-lots. The majority of the runoff from the site will be conveyed west of the site to the existing Shortline Ditch. From there on, stormwater will be routed north to a regional detention pond. There are no major basin problems affecting the site.

The site lies within Zone X, which delineates areas determined to be outside the flood plain with 0.2% annual chance of flooding. The FEMA FIRMETTE MAP can be seen in Appendix A.

### 1.5.Rainfall Erodibility & Erosion Sediment Control Methods

Attached at the end of the this report is a drawing that describes the proposed site conditions, as well as the locations of the erosion control Best Management Practices (BMPs). The Erosion Control Plan depicts the anticipated drainage patterns after major grading activities and the anticipated locations for BMPs such as silt fence, inlet protection, and staging areas. It has been assumed that the majority of the surrounding areas will remain in their present state during the construction of this project.

The Contractor will be responsible for implementing and maintaining the erosion and sediment control measures described in the document and the accompanying design drawings. The Contractor may designate these tasks to certain subcontractors as he sees fit, but the ultimate responsibility for implementing these controls and their proper function at each phase of the project remains with the Contractor. The order of major activities will be as follows:

1. Install vehicle tracking control and other perimeter soil erosion control measures.
2. Clear and rough grade for improvements.
3. Excavate and install improvements including underground piping, manholes, and drainage structures.
4. Fine grading.
5. Final stabilization.
6. Clean up.

**Construction Sequence Chart**

| | *Mobilization* | *Demolition* | *Grading* | *Utilities Installation* | *Flat work Installation* | *Vertical Installation* | *Landscape* | *Demobilization* |
|---|---|---|---|---|---|---|---|---|
| **Best Management Practices (BMPs)** | | | | | | | | |
| **Structural "Installation"** | | | | | | | | |
| Silt Fence Barriers* | ■ | ■ | ■ | ■ | ■ | ■ | | |
| Vehicle Tracking Pad* | ■ | ■ | ■ | ■ | | | | |
| Inlet Filter Bags* | Any prior inlets that could use protecting | | | ■ | ■ | ■ | ■ | |
| Rock Bags* | Any prior inlets that could use protecting | | | ■ | ■ | ■ | ■ | |
| Rip Rap | | | | ■ | ■ | ■ | ■ | ■ |
| Collecting Asphalt / Concrete Saw Cutting Waste | | ■ | | ■ | ■ | | | |
| *All BMPs to be Removed once Construction is Complete. | | | | | | | | |
| **Vegetative** | | | | | | | | |
| Temporary Seeding Planting | | Any time the site will sit dormant longer than 30 Days. | | | | | | |
| Mulching/Sealant | | Any time the site will sit dormant longer than 30 Days. | | | | | ■ | ■ |
| Permanent Seeding Planting | | | | | | | ■ | ■ |
| Sod Installation | | | | | | | ■ | ■ |
| Rolled Products : Netting/Blankets/Mats | | Any time the site will sit dormant longer than 30 Days. | | | | | ■ | ■ |

### 1.6.Non-Stormwater Discharge

Non-stormwater discharges will be eliminated or reduced to the fullest extent feasible. This plan does not cover construction dewatering. Pumping or draining groundwater that has infiltrated into an excavation requires a general permit for construction dewatering, regardless of the size of the project. Stormwater that mixes with groundwater in an excavation is also subject to the controls in the general permit for Construction Dewatering.

No materials shall be discharged in quantities that will have an adverse effect on the receiving waters. The measures listed below will be implemented to achieve these objectives.

- Proper and lawful disposal of all waste materials.
- Control any spills and leaks that may occur and clean up (mitigate).
- Use of designated areas for equipment repair and cleaning.
- Careful application of irrigation water.

All potential pollutants used during construction other than sediment, will be handled and disposed of in a manner that does not contaminate storm water.

All materials used during construction, which have the potential to impact storm water quality will be stored, managed, used and disposed of in a manner that minimizes the potential for releases to the environment, especially storm water.

# 2.0 STORMWATER MANAGEMENT CONTROLS

## 2.1.Controls Overview

During construction, several controls and measures shall be implemented under the direction of the General Contractor to prevent offsite discharge of contaminated storm water. Controls for this project include erosion, sedimentation, stabilization, and other BMPs. Specifications and engineering drawings for the selected BMPs can be found on the drawing included in the back pocket of this report.

The contractor shall comply with the attached plans and guidelines as a minimum. Field conditions and unforeseen circumstances will dictate modifications to or additions to this Stormwater Management Plan. Where storm water pollution potential exists, appropriate preventative measures (BMPs) must be utilized and documented, whether such measures are identified in this report or not.

## 2.2.Erosion and Sediment Controls

The objective of erosion control is to limit the amount of erosion occurring on disturbed areas until the site is stabilized. The objective of sediment control is to capture the soil that has been eroded before it leaves the construction site. Despite the use of both erosion and sediment control measures, it is recognized that some sediment could remain in runoff leaving the construction site. This should be minimized to the maximum extent practicable.

The BMPs scheduled for use during the construction of this site can be divided into Structural and Non-Structural Practices. Section 2.2.1 of this report discusses the proposed structural BMPs to be utilized. Section 2.2.2 discusses the non-structural practices.

### 2.2.1. Structural Practices (See drawings for locations)

Structural BMPs are structural site management practices that will minimize erosion and sediment transport. Such practices may include silt fences, drainage swales, inlet protections, outlet protection, etc. The goal of structural BMPs on this project is to protect areas downstream of the site from turbid water, sediment, oils and other contaminants, which may mobilize during storm water flows. The structural BMPs that may be utilized on the subject site are depicted in the Drainage and Erosion Control Plan and are described in more detail as follows:

Silt Fence:

- A temporary vertical barrier of filter fabric attached to and supported by posts and entrenched into the ground.
- Utilized to intercept sediment from disturbed areas during construction operations.
- Used to filter shallow sheet flow.
- Typically used along the toe of fills, in transition areas between cut and fills, and adjacent to streams.
- Generally installed prior to or immediately following land-disturbance activity.
- Shall be inspected periodically and after each rain or snowfall event and repaired when necessary. Sediment shall be removed from behind the fence when it accumulates to one-half the exposed fabric height. Sediments removed must be properly disposed.
- Utilized as a temporary feature.

Inlet Protection:

- A barrier across or around a storm drain drop inlet, a curb inlet, or a culvert inlet.
- Utilized to intercept and filter sediment-laden runoff and prevent it from entering storm drainage systems.
- Not to be utilized in place of a sediment-trapping device. Used as a secondary control device.
- Do not use where ponded water might flow onto the roadway.
- Blocking of the inlet should not be watertight.
- Generally installed prior to land-disturbance activity on existing inlets and immediately after the construction of new inlets.
- Shall be inspected periodically and after each rain or snowfall event and repaired when necessary. Accumulated sediment shall be removed and properly disposed.
- Utilized as a temporary feature.

Outlet Protection:

- A structurally lined apron (generally with riprap, grouted rip rap, or concrete) placed at the outlet of pipes or paved channel sections.
- Used as an energy dissipation device to prevent scour and erosion at the outlet by reducing the velocity and energy of concentrated flow.
- Shall be installed immediately following the construction of the upstream conveyance element.
- Inspection shall be performed after high flows for scour and dislodged stones. Repairs shall be made immediately.
- Utilized as a permanent feature.

Grading Techniques:

- Soil surface roughening, terracing and rounding at tops of cuts, transitions and roadway ditches to facilitate plant establishment and minimize erosion.
- Utilized to temporarily stabilize disturbed areas and protect from wind and water erosion immediately after grading activities have ceased.
- Used as a temporary practice during construction.
- Inspection and maintenance must be provided periodically and after each rain or snowfall event that causes runoff to ensure roughened state is maintained.
- Rills developed should be filled and the area re-graded immediately.

Erosion control measures are the responsibility of the General Contractor to inspect and maintain. Any existing erosion control devices that are removed in order to complete the construction of the utilities shall be replaced immediately following the construction that required its removal unless directed otherwise by the *construction plans.*

### 2.2.2. Non-Structural Practices (See drawings for locations)

Non-Structural BMPs are both interim and permanent stabilization practices. Such practices may include temporary seeding, permanent seeding, mulching, geotextiles, sod stabilization, vegetative buffer strips, tree protection, preservation of mature vegetation, etc. The non-structural BMPs that may be utilized on the subject site are described in more detail as follows:

Temporary and Permanent Seeding:

- Soil preparation, seeding, mulch tackifier and/or mulching shall be required for all disturbed areas that are not hardscaped, paved, stabilized.
- Exposed soils, which are not part of the active grading and/or construction activity, shall be stabilized.
- Seeded areas shall be inspected frequently. If the seeded areas fail to establish, provide adequate ground coverage. If seeded areas are disturbed, the area should be re-seeded.
- Permanent landscaping and vegetative cover is depicted on the Landscaping plans.

Mulching:

- Application of plant residues to the soil surface. Typical mulching material includes certified weed free hay or straw, certified under the Colorado Department of Agriculture Weed Free Forage Certification Program as regulated by the Weed Free Forage Act, Title 35, Article 27.5, CRS and wood cellulose fiber.
- Utilized in combination with mulch tackifier for temporary erosion control (i.e., incomplete slopes, detour slopes, stockpiles).
- Utilized in combination with mulch tackifier for temporary erosion control on slopes when seeding is not allowed due to seasonal constraints.
- Used to cover permanent or temporary seed areas. Hydromulch shall not be done in the presence of free surface water.

- Inspect frequently and reapply mulching in areas where the mulching has been loosened or removed. Mulch tackifier must be applied with additional applications of mulching.

Mulch Tackifier:

- An organic soluble powder adhesive used as a water slurry to adhere native hay, straw, hydromulch, or seed to a surface and together.
- Used to cover disturbances as temporary cover for wind erosion.
- Mulch movement indicates poor application and procedure mixture.
- Proper application will bond mulch material together and to soil.
- Inspect by touching mulch surface to determine if adhesion has occurred.

Maintain Existing Vegetation:

- Existing vegetation should be preserved where possible to prevent the migration of sediment.
- Should be inspected regularly.
- Establish and maintain buffers.
- Areas beginning to show signs of erosion or soil transport may require additional emergency BMPs.

### 2.2.3. Other Controls (See drawings for location)

Vehicle Tracking Control / Construction Entrance:

- A temporary stabilized layer of aggregate underlined with geotextile or gravel located where traffic enters or exits the construction site.
- The structure shall be constructed prior to any construction activity and maintained daily.
- Stone shall be added and repairs performed as conditions require.
- When mud is present and not easily removed by a tracking pad, tire washing should be implemented as needed. Tire washing operations should occur near the construction exit on a stabilized stone pad. Implementation of a tire washing area should include provisions for collecting wash water and directing it to an onsite pond.

Tracking of Sediment onto Roads and Streets:

- Public and private roadways shall be kept clear of accumulated sediment. Bulk clearing of accumulated sediment shall not include flushing the area with water. Sediment will be shoveled and or swept from the street and disposed of in a manner that prevents contamination of storm water or surface water runoff.

## 2.3.SWMP Administrator

Implementation and management of the environmental aspects of this project under this SWMP Plan are the responsibilities of the General Contractor. The General Contractor shall ensure the all contractors providing services on the project have

access to a copy of the SWMP Plan and appropriate training regarding storm water pollution prevention. The General Contractor, Building Contractor, Utility Installations Contractor, Grading Contractor and all other contractors and subcontractors shall be familiar with the SWMP Plan and their responsibilities on the plan.

## 2.4.Materials Management

### 2.4.1. Potential Pollution Sources

It is anticipated that this construction project will not utilize any abnormal or atypical hazardous materials. The construction site will operate much like other typical construction projects. The following materials or substances are expected to be present onsite during construction:

| | |
|---|---|
| Concrete/Additives/Wastes | Cleaning solvents |
| Detergents | Petroleum based products |
| Paints/Solvents | Pesticides |
| Acids | Fertilizers |
| Solid and construction wastes | Sanitary wastes |
| Soil stabilization additives | |

Activities on the site that may have an impact on stormwater include the following:

- Equipment and/or vehicle washing
- Fertilizers, chemicals, or other material storage
- Vehicle maintenance or fueling
- Waste incineration, treatment, storage or disposal
- Off-site vehicle tracking
- Loading/unloading areas
- Concrete truck washout

As construction progresses, specific areas shall be designated for vehicle maintenance and refueling, material and waste storage, construction equipment staging, and bathroom facilities. Management measures and procedures for these facilities are discussed later in the plan.

### 2.4.2. Pollution Prevention Measures

Pollution prevention measures shall be utilized to prevent construction materials with the potential of polluting stormwater, such as those listed above, from coming in contact with runoff. Measures include good housekeeping and proper disposal of construction and demolition debris, equipment fuel, lubricants, paints and solvents, asphalt, concrete, topsoil and other materials, as well as controls which prevent

sediments from being tracked off-site by construction vehicles, and proper control of any non-stormwater flows on-site.

As previously stated, Best Management Practices (BMPs) are schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce pollution of public waters. BMPs also control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. With regard to construction, these may include structural controls and nonstructural practices that are designed to prevent pollutants from entering water or direct the flow of water away from potential sources of pollution.

For construction sites, there are three main types of BMPs, those that prevent erosion and sediment transport, others that prevent pollutants from construction materials from mixing with stormwater, and those that trap pollutants before they can be discharged. BMPs for most common construction materials and wastes with the greatest potential for adversely affecting stormwater quality are as follows:

BMPs for Disturbed and Stored Soils:

- Seeding and mulching should be completed for the site
- Soil preparation, seeding, mulch tackifier and/or mulching shall be required for all disturbed areas that are not surfaced.
- Exposed soils, which are not part of the active grading and/or construction activity, shall be stabilized.
- Seeded areas shall be inspected frequently. If the seeded areas fail to establish, provide adequate ground coverage. If seeded areas are disturbed, the area should be re-seeded.
- Permanent landscaping and vegetative cover is depicted on the Landscaping plans.

BMPs for Vehicle Tracking of Sediment:

- Use vehicle tracking pads at the entrances of construction
- Public and private roadways shall be kept clear of accumulated sediment. Bulk clearing of accumulated sediment shall not include flushing the area with water. Sediment will be shoveled and or swept from the street and disposed of in a manner that prevents contamination of storm water or surface water runoff.
- A temporary stabilized layer of aggregate underlined with geotextile or gravel located where traffic enters or exits the construction site.
- The structure shall be constructed prior to any construction activity and maintained daily.
- Stone shall be added and repairs performed as conditions require.
- When mud is present and not easily removed by a tracking pad, tire washing should be implemented as needed. Tire washing operations should occur near the construction exit on a stabilized stone pad. Implementation of a tire washing area should include provisions for collecting wash water and directing it to an onsite pond

BMPs for Management of Contaminated Soils:

- Have equipment to contain and clean up spills of hazardous materials in the vicinity of where these materials are to be stored or used.
- Contain and clean up spills immediately after they occur. Contact State or Local solid waste regulatory agency concerning information and procedures necessary to treat or dispose of contaminated soils.
- Keep materials in a dry covered area and elevated from the ground.

BMPs for Loading and Unloading Operations:

- Select a loading and unloading area for the site

BMPs for Outdoor Storage Activities:

- Select an outdoor storage area for the site
- When possible store equipment and material in covered areas

BMPs for Equipment Maintenance and Fueling:

- Fueling operations shall occur in a designated area.
- Have equipment to contain and clean up petroleum spills in fuel storage areas or on board maintenance and fueling vehicles.
- Where possible, store petroleum products and fuel vehicles in covered areas and construct dikes to contain spills.
- Contain and clean up spills immediately.
- Use preventive maintenance for onsite equipment such as checking for and fixing gas and oil leaks in construction vehicles on a regular basis.
- Follow proper procedure for the handling and application of asphaltic substances.
- Oversee all filling operations.
- Fueling equipment and area shall be fenced and valving locked to prevent vandalism.

BMPs for Significant Particulate Generating:

- Use silt fence and inlet protection to protect the areas downstream of the site
- Maintain and clean out any sediment that builds up around the inlet protection and silt fence

BMPs for On-Site Waste Management:

- Select a designated waste collection area onsite.
- Provide an adequate number of containers with lids or covers that can be placed over the containers prior to rainfall.
- When possible, locate containers in a covered area.
- Arrange for waste collection before containers overflow.
- If a container does spill, provide cleanup immediately.
- Plan for additional containers and more frequent pickups during the demolition phase of construction.

- Make sure that construction waste is collected, removed, and disposed of only at authorized disposal areas.
- Check with local solid waste management agency for specific guidance.
- Trash, debris and spoils shall be properly contained at the END of EACH day.

BMPs for residual Concrete disposal:

- Emptying or wash out of excess concrete may be allowed on site. Excess concrete and wash water should be disposed of in a manner that prevents contact between these materials and stormwater discharges from the site.
- Residual concrete shall be discharged in specifically designated dike areas, which have been prepared to prevent contact between the concrete and/or washout and stormwater discharged from the site and/or ground water.
- The hardened residue from the dike areas shall be disposed of in the same manner as other non-hazardous construction waste materials or may be broke up and utilized as deemed appropriate by the contractor.
- The use of the washout area shall be temporary (less than one year).
- Washing of trucks and masonry equipment is to be performed only at a designated concrete washout. No burying of wastes.

BMPs for Sanitary/Septic Wastes:

- Sanitary or septic wastes that are generated onsite should be treated or disposed of in accordance with State or local requirements.
- If self-contained, temporary facilities are utilized, the domestic waste haulers should be contracted to regularly remove the sanitary and septic wastes and to maintain the facilities in good working order.
- Any facilities to be connected to a sanitary sewer system should be properly hooked to the sanitary sewer system to prevent illicit discharges.
- Untreated, raw sewage should never be discharged or buried onsite.
- Contact local government and State regulatory agencies to ensure the compliance with State or local requirements.
- If sewage is being discharged to the sanitary sewer, the local treatment works authority should be contacted.

BMPs for pesticides:

- Store pesticides in a dry covered area and elevate above the ground.
- Provide curbs or dikes to contain possible spills.
- Have measures on site to contain and clean up spills.
- Strictly follow recommended application rates and recommended application methods.
- Only a Certified Applicator shall use pesticides.

BMPs for Fertilizers/Detergents:

- Limit the application of fertilizers to the minimum area and minimum recommended amounts.

- Reduce exposure of nutrients to storm water runoff by working the fertilizer deep into the soil.
- Apply fertilizer more frequently, but at lower application rates.
- Hydro seeding, where lime and fertilizers are applied to the ground surface in one application should be limited, where possible.
- Limit the use of detergents onsite: wash water containing detergents should not be discharged to the storm system.
- Implement good erosion and sediment control to help reduce the amount of fertilizers that can leave the site as well as sediments.
- Fertilizers and detergents shall be stored in dry and covered area and elevated above the ground.
- Berming shall be provided around the storage area to avoid contact with stormwater runoff.

BMPs for Hazardous Wastes Disposal:

- Check with local waste management authorities to determine what the requirements are for disposing of hazardous materials.
- Use the entire product before disposing of the container.
- Do not remove the original product label from the container. It contains important information.
- Do not mix products together unless specifically recommended by the manufacturer.
- The correct disposal of these products varies with the product utilized. Follow the manufacturers recommended method, which is often found on the label.

### 2.5.Spill Management

Construction site supervisors should create and adopt a spill control plan that includes measures and procedures to stop the source of the spill, contain the spill, clean up, and disposal of contaminated materials. Key personnel shall be identified and trained to be responsible for spill prevention and control. The following measures would be appropriate for a spill prevention and response plan:

- Store and handle materials to prevent spills.
    - Tightly seal containers.
    - Make sure all containers are clearly labeled.
    - Stack containers neatly and securely
    - Where possible, store containers on pallets in a covered area.
- Reduce stormwater contact if there is a spill.
    - Have cleanup procedures clearly posted.
    - Have cleanup materials readily available.
    - Contain any liquid.
    - Stop the source of the spill.
    - Cover spill with absorbent material.
- Dispose of contaminated materials according to manufacturer's instructions or according to State or local requirements.

- Identify personnel responsible for responding to a spill of toxic or hazardous materials.
    - Provide personnel spill response training.
    - Post names of spill response personnel.
- Keep the spill area well ventilated.

Additionally, records of spills, leaks, or overflows that result in the discharge of pollutants must be documented and maintained. Information such as the time and date, weather conditions, response procedure taken, response personnel involved, reasons for the spill, etc., shall be recorded for all occurrences in the SWMP Plan and on the map.

Spill Categories are as follows:

Minor Spills

- Any event that involves 5 gallons or more and or involves the following:
- Less than the reportable quantity
- Stays within the permitted area
- Does not threaten any stormwater conveyances

Significant Spills

- Reportable Quantity (SARA title III List of Lists, available from EPA for reportable quantity)
- Any amount leaving the permitted area
- And/or threatens any water conveyances.

Hazardous Spills

- Any substance requiring a MSDS response.
- Procedure shall include but limited to:
    - Secure the area
    - Provide first aid
    - Notify emergency response personnel

Some spills may need to be reported to the Division of Water Quality and the City of Fort Lupton immediately. Specifically significant spills that are, a release of any chemical, oil, petroleum product, sewage, etc., which may enter waters of the State of Colorado (which include surface water, ground water and dry gullies or storm sewers leading to surface water), any spill that exceeds the reportable quantity, and any amount that leaves the permitted area must be reported. The Division's toll-free 24-hour environmental emergency spill reporting line is 1-877-518-5608. Written documentation to both the CDPHE (Division) and the City of Fort Lupton of significant spills should be provided within 5 days.

# 3.0 Dry Land Vegetation

### 3.1.Soil and Surface Conditions

The Coyote Creek Filing No. 4 site consists of Nelson fine sandy loams and Olney fine sandy loams, which the USDA-NSCS classifies as Type B soils. Type B soils have a moderated infiltration rate when thoroughly wet and chiefly consist of soils that have moderately fine texture to moderately coarse texture. See Appendix A for the soil map.

### 3.2.Seed Mixes

A standard City of Fort Lupton seed mix should be used for the site. If a standard mix is not used than a request to the City must be submitted of the preferred seed mix with the application rates.

### 3.3.Mulches

Typical mulching material includes certified weed free hay or straw, certified under the Colorado Department of Agriculture Weed Free Forage Certification Program as regulated by the Weed Free Forage Act, Title 35, Article 27.5, CRS and wood cellulose fiber. Mulch should be utilized in combination with mulch tackifier for temporary erosion control (i.e., incomplete slopes, detour slopes, stockpiles) when seeding is not allowed due to seasonal constraints. Mulch is also used to cover permanent or temporary seed areas. The mulch should be inspected frequently and reapplied in areas where the mulch has been loosened or removed. Mulch tackifier must be applied with additional applications of mulching.

# 4.0 Detailed Sequence of Construction Activities

**Sequence of Land Disturbing Activity Chart**

| | *Mobilization* | *Demolition* | *Grading* | *Utilities Installation* | *Flat work Installation* | *Vertical Installation* | *Landscape* | *Demobilization* |
|---|---|---|---|---|---|---|---|---|
| **Best Management Practices (BMPs)** | | | | | | | | |
| **Structural "Installation"** | | | | | | | | |
| Silt Fence Barriers* | ■ | ■ | ■ | ■ | ■ | ■ | | |
| Vehicle Tracking Pad* | ■ | ■ | ■ | ■ | | | | |
| Inlet Filter Bags* | Any prior inlets that could use protecting | | | ■ | ■ | ■ | ■ | |
| Rock Bags* | Any prior inlets that could use protecting | | | ■ | ■ | ■ | ■ | |
| Rip Rap | | | | ■ | ■ | ■ | ■ | ■ |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Collecting Asphalt / Concrete Saw Cutting Waste | | | | | | | | |
| *All BMPs to be Removed once Construction is Complete. | | | | | | | | |
| **Vegetative** | | | | | | | | |
| Temporary Seeding Planting | | Any time the site will sit dormant longer than 30 Days. | | | | | | |
| Mulching/Sealant | | Any time the site will sit dormant longer than 30 Days. | | | | | | |
| Permanent Seeding Planting | | | | | | | | |
| Sod Installation | | | | | | | | |
| Rolled Products : Netting/Blankets/Mats | | Any time the site will sit dormant longer than 30 Days. | | | | | | |

# 5.0 Inspection and Maintenance

## 5.1.Inspection and Maintenance Overview

A site inspection of all erosion control facilities shall be conducted at least once every two weeks and immediately following any significant precipitation or snowmelt event that could cause surface erosion and every 30 days for inactive construction projects. The inspection must determine if there is evidence of, or the potential for, pollutants entering the drainage system, and BMPs should be reviewed to determine if they still meet the design and operational criteria in the SWMP Plan and that they continue to adequately control pollutants at the site. The construction site perimeter, disturbed areas, discharge points and areas used for material storage that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the storm drainage system. Erosion and sediment control measures identified in this SWPM Plan and on the construction plans shall be observed to ensure that they are operating correctly. Any other structural BMPs that may require maintenance, such as secondary containment around fuel tanks or the conditions of spill response kits shall also be inspected. Stormwater items to be inspected include the following:

- Condition & failures of structural & non-structural BMPSs
- Perimeter and outfall structure
- Evidence of spills, upsets & discharges
- Maintaining accurate SWMP Plan documentation
- Material Handling and storage
- Good Housekeeping
- Site Stabilization
- Meet authorities during inspections
- Update permit disturbed acreage
- Equipment and vehicle storage area
- Maintenance records of equipment, systems & operations

The project site and the adjacent streets impacted by the construction shall be kept neat, clean and free of debris. The control measures and facilities need to be maintained in good working order. Any items that are not functioning properly or are inadequate should be promptly repaired or upgraded. The site shall be inspected by responsible personnel who are familiar with the site. Inspection and monitoring will follow the procedures outlined below:

Minimum Monitoring (Inspection) Requirements:

- Inspections of the construction site shall be conducted by the contractor (or agent) every two weeks and after significant storm events.
- The qualified site superintendent familiar with this SWMP Plan /BMP shall perform the inspections.
- The contractor shall certify the site is in compliance with the SWMP Plan /BMP and the permit by:
    - Ensuring that areas contributing significant storm water discharges related to the construction activities have been identified.
    - Evaluating preventive measures required by the SWMP Plan /BMP to insure they are adequate and has been properly implemented.
    - Points of discharge from the site will be inspected to check for signs of pollutant discharge.
    - Certifying the grade elevations and capacity of permanent sedimentation facilities.
    - Determining if additional control measures will need to be implemented.
    - Updating this SWMP Plan if new measures are implemented or existing controls are deleted.

Based on the results of the inspection, the description of potential pollutant sources, and the pollution prevention and control measures that are identified within this plan shall be revised and modified as appropriate and as soon as practicable after such inspection. Typically corrective action shall commence immediately when a deficiency is observed.

In addition to the inspections performed at least every 7 days, several daily inspections will be required. Each day when any type of construction activity has taken place onsite, qualified personnel provided by the General Contractor shall:

- Inspect all onsite areas where petroleum products are stored, used or handled for spills and leaks from vehicles and equipment.
- Inspect all onsite locations where vehicle enter or exit the site for evidence of offsite sediment tracking.

## 5.2.Final Stabilization and Long Term Stormwater Management

Permanent stabilization will be achieved by establishing a vegetative cover on all disturbed areas. The vegetative cover will be as specified on the Landscape Plan. Final stabilization shall be considered complete when all paving and landscaping are completed and the vegetative cover has been established with a density of at least 70 percent of pre-disturbance levels (including shrubs and trees).

In general spring and fall encouraged whenever possible. Temporary and permanent seeding shall be completed within 14 days after grading has ceased and left to idle for more than 30 days. Care should be taken to complete seeding activities prior to November 1st for disturbed land intending to remain inactive for the winter months.

Roughening and scarifying disturbed areas is allowed as a temporary stabilization with the following conditions:

- During winter activity
- Intended to seeded in the spring fall seasons
- Intended to be active within 2-3 months of inactivity (with Stormwater approval)

Management of storm water after completion of construction will be accomplished by utilizing the practices listed below:

- Upon completion of construction, the site shall be inspected to ensure that all equipment, waste materials, and debris have been removed.
- The site will be inspected to make certain that all graded surfaces have been landscaped or seeded with an appropriate ground cover.
- Upon acceptance of final stabilization measures, all temporary BMP's shall be removed and proper function of inlets, drainage ways, or other storm water conveyance elements shall be restored.
- The storm sewer systems and the detention pond will be returned to full capacity and the outlet structures will be checked to assure they are unclogged and in working order.

The General Contractor shall be responsible for maintaining the storm water controls in good working order including removal measures until the Inactivation Notice is filed with the State. The state requires the Inactivation Notice be filed within 3 months of the proposed end of construction. Alternatively, permit responsibilities may be transferred or reassigned by submitting a Notice of Transfer and Acceptance of Terms or a Reassignment of Coverage if control of a portion of the site changes parties.

# 6.0 CONCLUSION

This Stormwater Management Plan has been prepared in accordance with the criteria and methods described in the "State of Colorado General Permit Application and Stormwater Management Plan Guidance for Stormwater Discharges Associated with Construction Activity." The drainage system has been designed to comply with the regulatory requirements of the City of Fort Lupton Design Criteria Manual and Construction Specifications. All temporary and permanent erosion and sediment control BMPs shall be inspected, maintained and repaired by the General Contractor as needed to ensure continued performance of their intended function.

The General Contractor shall remove all temporary erosion and sediment control BMPs after stabilization is achieved or after temporary BMPs are no longer needed. Trapped sediment will be removed by the General Contractor or stabilized onsite. Disturbed soil areas resulting from removal of BMPs will be to be permanently stabilized with vegetation as soon as possible.

# 7.0 REFERENCES

1. Urban Storm Drainage Criteria Manual (Volumes 1, 2, and 3), Urban Drainage and Flood Control District, (Rev. April 2008)

2. "Hydrologic Group Rating for Larimer County Area, Colorado", USDA-Natural Resources Conservation Service, National Cooperative Soil Survey. Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov.

**APPENDIX A**
**Figures**

N

500 250 0 500

ORIGINAL SCALE: 1" = 500'

APPENDIX A
VICINITY MAP
JOB NO. 16093.00
2021-11-10
SHEET 1 OF 1

J·R ENGINEERING
A Westrian Company

Centennial 303-740-9393 • Colorado Springs 719-593-2593
Fort Collins 970-491-9888 • www.jrengineering.com

Map Scale: 1:2,510 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 35 70 140 210

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

## MAP LEGEND

**Area of Interest (AOI)**

- Area of Interest (AOI)

**Soils**

**Soil Rating Polygons**

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

**Soil Rating Lines**

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

**Soil Rating Points**

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

**Water Features**

- Streams and Canals

**Transportation**

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

**Background**

- Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Weld County, Colorado, Southern Part
Survey Area Data: Version 20, Aug 31, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 19, 2018—Aug 10, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

# Hydrologic Soil Group

| Map unit symbol | Map unit name | Rating | Acres in AOI | Percent of AOI |
|---|---|---|---|---|
| 37 | Nelson fine sandy loam, 0 to 3 percent slopes | B | 6.7 | 41.0% |
| 47 | Olney fine sandy loam, 1 to 3 percent slopes | B | 9.6 | 59.0% |
| **Totals for Area of Interest** | | | **16.2** | **100.0%** |

## Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

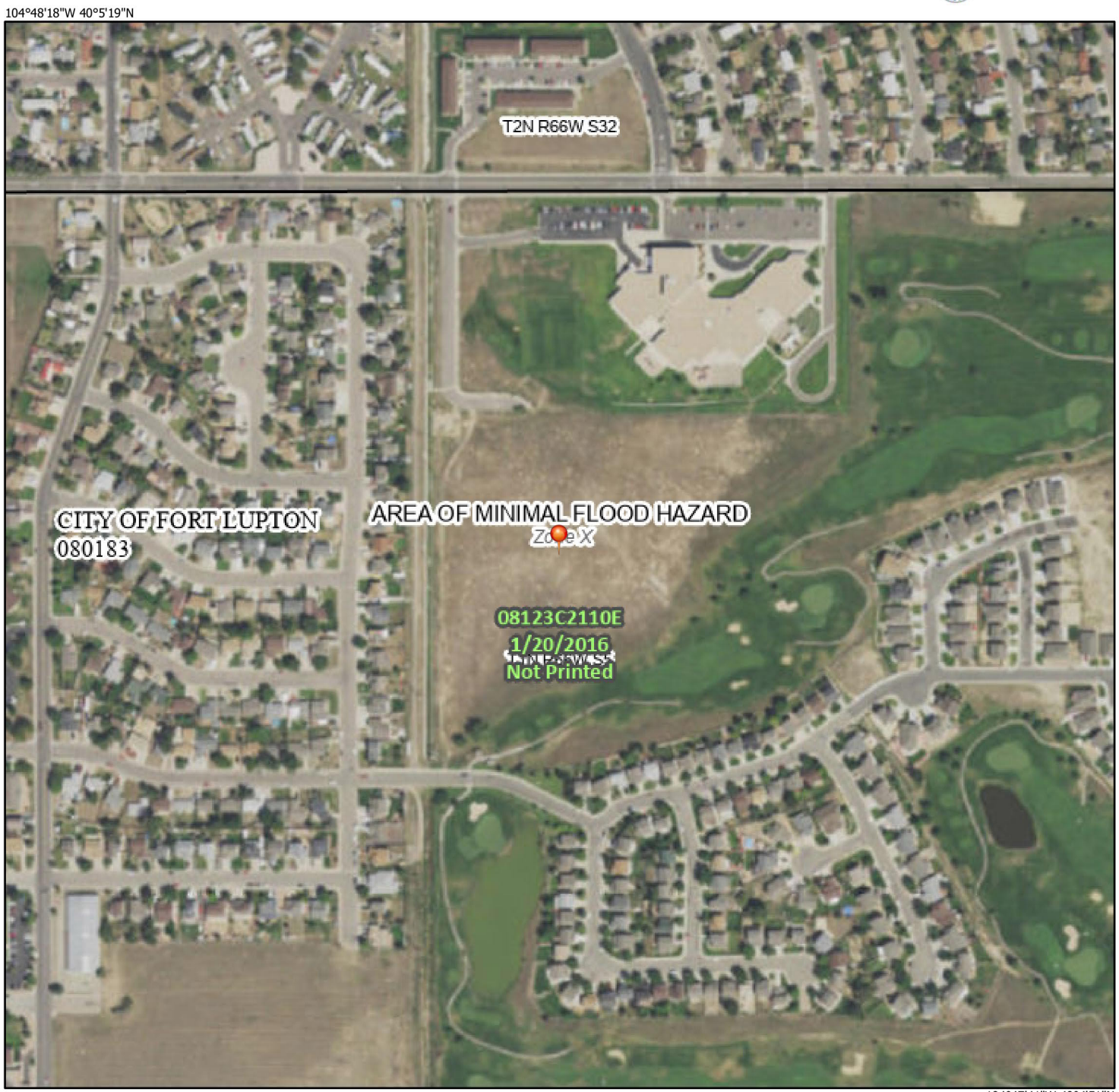
## Rating Options

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff: None Specified*

*Tie-break Rule:* Higher

# National Flood Hazard Layer FIRMette




*Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020*

## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

**SPECIAL FLOOD HAZARD AREAS**
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

**OTHER AREAS OF FLOOD HAZARD**
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

**OTHER AREAS**
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

**GENERAL STRUCTURES**
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

**OTHER FEATURES**
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

**MAP PANELS**
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

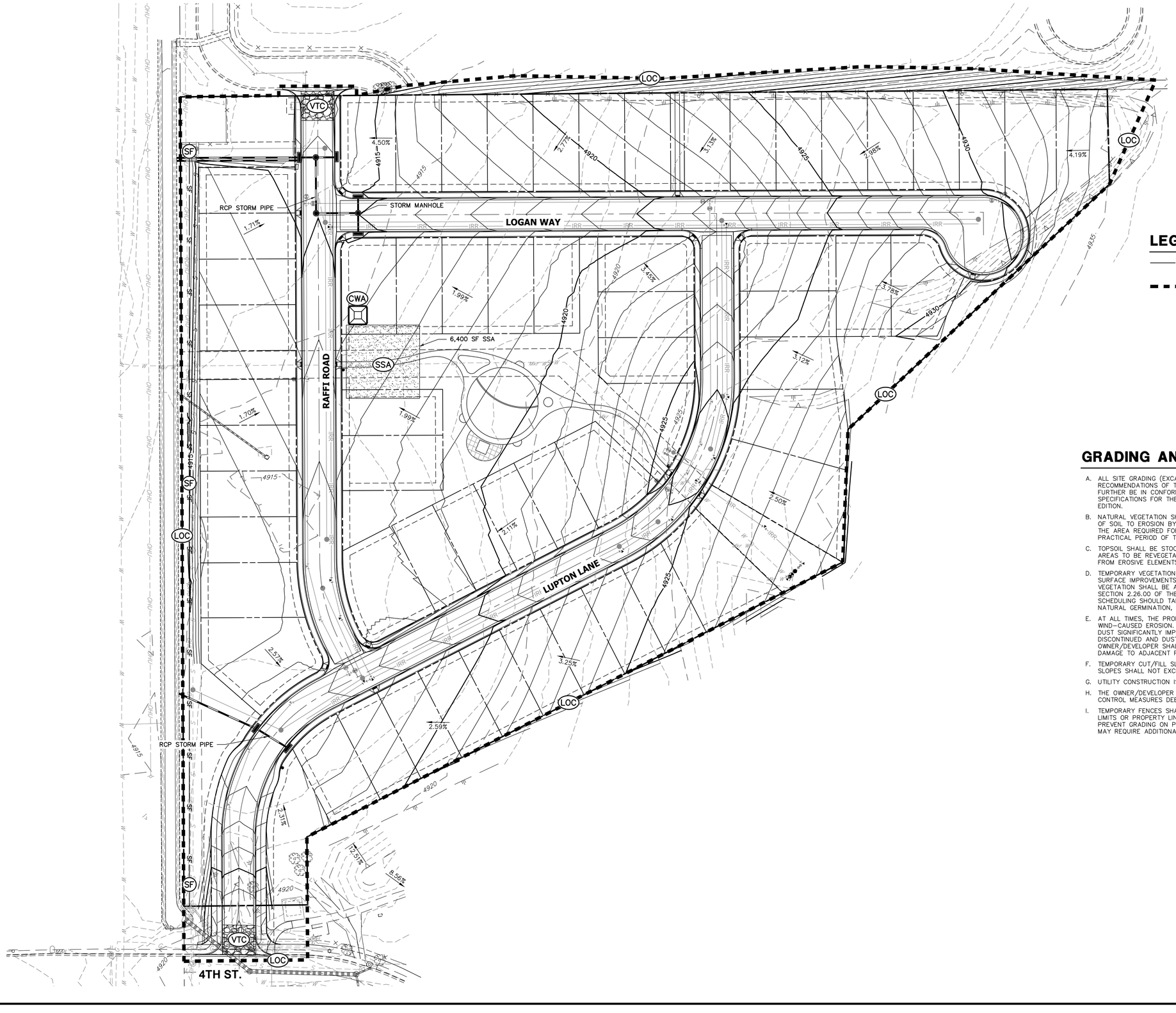
This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 11/16/2021 at 11:30 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

**APPENDIX B**
**Erosion Control Plans**

# COYOTE CREEK FILING NO. 4




## LEGEND

- SF — SILT FENCE
- LOC — LIMITS OF CONSTRUCTION
- VTC — VEHICLE TRACKING CONTROL
- CWA — CONCRETE WASHOUT AREA
- IP — INLET PROTECTION
- SCL — SEDIMENT CONTROL LOG
- SSA — STABILIZED STAGING AREA

## GRADING AND EROSION CONTROL NOTES

A. ALL SITE GRADING (EXCAVATION, EMBANKMENT, AND COMPACTION) SHALL CONFORM TO THE RECOMMENDATIONS OF THE LATEST SOILS INVESTIGATION FOR THIS PROPERTY AND SHALL FURTHER BE IN CONFORMANCE WITH THE CITY OF FORT LUPTON'S "STANDARDS AND SPECIFICATIONS FOR THE DESIGN AND CONSTRUCTION OF PUBLIC IMPROVEMENTS," LATEST EDITION.

B. NATURAL VEGETATION SHALL BE RETAINED AND PROTECTED WHEREVER POSSIBLE. EXPOSURE OF SOIL TO EROSION BY REMOVAL OR DISTURBANCE OF VEGETATION SHALL BE LIMITED TO THE AREA REQUIRED FOR IMMEDIATE CONSTRUCTION OPERATION AND FOR THE SHORTEST PRACTICAL PERIOD OF TIME.

C. TOPSOIL SHALL BE STOCKPILED TO THE EXTENT PRACTICABLE ON THE SITE FOR USE ON AREAS TO BE REVEGETATED. ANY AND ALL STOCKPILES SHALL BE LOCATED AND PROTECTED FROM EROSIVE ELEMENTS.

D. TEMPORARY VEGETATION SHALL BE INSTALLED ON ALL DISTURBED AREAS WHERE PERMANENT SURFACE IMPROVEMENTS ARE NOT SCHEDULED FOR INSTALLATION WITHIN THREE MONTHS. VEGETATION SHALL BE A VIGOROUS, DROUGHT TOLERANT, NATIVE SPECIES MIX. (REFER TO SECTION 2.26.00 OF THESE STANDARDS AND SPECIFICATIONS FOR SEEDING MIX.) PROJECT SCHEDULING SHOULD TAKE ADVANTAGE OF SPRING OR FALL PLANTING SEASONS FOR NATURAL GERMINATION, BUT SEEDED AREAS SHALL BE IRRIGATED, IF CONDITIONS SO MERIT.

E. AT ALL TIMES, THE PROPERTY SHALL BE MAINTAINED AND/OR WATERED TO PREVENT WIND-CAUSED EROSION. EARTHWORK OPERATIONS SHALL BE DISCONTINUED WHEN FUGITIVE DUST SIGNIFICANTLY IMPACTS ADJACENT PROPERTY. IF EARTHWORK IS COMPLETE OR DISCONTINUED AND DUST FROM THE SITE CONTINUES TO CREATE PROBLEMS, THE OWNER/DEVELOPER SHALL IMMEDIATELY INSTITUTE MITIGATIVE MEASURES AND SHALL CORRECT DAMAGE TO ADJACENT PROPERTY.

F. TEMPORARY CUT/FILL SLOPES SHALL NOT EXCEED A STEEPNESS OF 2:1 (2H:1V). PERMANENT SLOPES SHALL NOT EXCEED 4:1 (4H:1V) IN AREAS TO BE SEEDED OR SODDED.

G. UTILITY CONSTRUCTION IS NOT APPROVED UNDER THIS PLAN.

H. THE OWNER/DEVELOPER SHALL PROVIDE ANY ADDITIONAL DUST ABATEMENT AND EROSION CONTROL MEASURES DEEMED NECESSARY BY THE CITY, SHOULD CONDITIONS MERIT THEM.

I. TEMPORARY FENCES SHALL BE INSTALLED ALONG ALL BOUNDARIES OF THE CONSTRUCTION LIMITS OR PROPERTY LINES AS SHOWN ON THE APPROVED EROSION CONTROL PLAN, TO PREVENT GRADING ON PROPERTY NOT OWNED BY THE DEVELOPER. IN ADDITION, THE CITY MAY REQUIRE ADDITIONAL TEMPORARY FENCES IF FIELD CONDITIONS SO MERIT THEM.

N

50 25 0 50 100

ORIGINAL SCALE: 1" = 50'

Know what's **below.**
**Call** before you dig.

UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, JR ENGINEERING APPROVES THEIR USE ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

PREPARED FOR
LUPTON LAND, LLC
10221 PRESTWICK TRAIL
LONE TREE, CO 80124
BOB QUINETTE
P-303.587.1966


J·R ENGINEERING
A Westrian Company
Centennial 303-740-9393 • Colorado Springs 719-593-2593
Fort Collins 970-491-9888 • www.jrengineering.com


| No. | REVISION | BY | DATE |
|---|---|---|---|
| | | | |

| | |
|---|---|
| H-SCALE | 1" = 50' |
| V-SCALE | N/A |
| DATE | 11/17/21 |
| DESIGNED BY | AJH |
| DRAWN BY | CRB |
| CHECKED BY | |

COYOTE CREEK FILING NO. 4

PRELIMINARY GRADING & EROSION CONTROL PLAN

SHEET 4 OF 27

JOB NO. 16093.00

# WILL SERVE LETTER

November 11, 2021

Lupton Land LLC
10221 Prestwick Trail
Lone Tree, CO 80124

Re: Coyote Creek Golf Course: Filing Four

Dear Bob Quinette,

This letter is to confirm that Xcel Energy is your utility provider for natural gas. In accordance with our tariffs, on file with and approved by the Colorado Public Utilities Commission, gas facilities can be made available to serve the project at Coyote Creek Golf Course, Filing Four. The cost, and whether any reinforcements or extensions are required, for the Company to provide those facilities will be determined by your designer upon receipt of application and project plans.

Your utility service(s) will be provided after the following steps are completed:

- ***Application submitted to Xcel Energy's "Builders Call Line (BCL)"*** – once your application is accepted you will be assigned a design department representative who will be your primary point of contact
- ***Utility design is completed*** – you must provide your design representative with the site plan, the one - line diagrams, and panel schedules for electric and gas loads if applicable
- ***All documents provided by design representative are signed and returned***
- ***Payment is received*** (Residential Service Laterals if applicable)
- ***Required easements are granted*** - you must sign and return applicable easement documents to your Right-of-Way agent
- ***Site is ready for utility construction*** - the site ready information can be found on our website at may be viewed at Construction and Inspection | Xcel Energy.

An estimated scheduled in-service date will be provided once these requirements have been met. It is important to keep in mind that the terms and conditions of utility service, per our tariffs, require that you provide adequate space and an easement on your property for all gas and electric facilities required to serve your project, including but not limited to gas and electrical lines and meters, transformers, and pedestals. General guidelines for requirements can be found on our website at xcelenergy.com/InstallAndConnect.

Xcel Energy looks forward to working with you on your project and if I can be of further assistance, please contact me at the phone number or email listed below.

Sincerely,

Amy Caswell
Xcel Energy Technician

Mailing address: Public Service Company of Colorado
5460 W 60th Ave
Arvada, CO 80003

November 16, 2021

Lee Eisenheim
Challenger Homes
8605 Exploerer Dr Suite 250
Colorado Springs, CO 80920

Dear Lee Eisenheim:

United Power is the provider of electric service in the area to the proposed Subdivision Coyote Creek, located in the Town of Fort Lupton, County of Weld, state of Colorado.

There is electrical distribution in the area that may or may not need to be upgraded, depending on the requirements of the site, in order to provide capacity and safe reliable power to the area. Service will be provided according to the rules, regulations, and policies in effect by United Power at the time service is requested.

We look forward to this opportunity to provide electric service. If you have any questions, please give me a call at 303-618-2987.
Sincerely,

Michael Neu

Michael Neu
Project Manager - West District
MKN: mz

Fort Lupton Fire Protection District
1121 Denver Avenue • Fort Lupton, Colorado 80621
Office: (303)857-4603 • Fax: (303)857-6619 • Website: www.fortluptonfire.org

**Date:** 12/22/2021
**Project name: Coyote Creek Filing No. 4**
**Project address: Parcel: 147105100053**, Fort Lupton, CO 80621
**FLFPD Project #** R2021-0043
**Plan reviewer: Taw Tamlin, Fire Marshal**

The Fire District has reviewed the submittal for **Coyote Creek Filing No. 4** located at **Parcel: 147105100053,** Fort Lupton, CO 80621. The submittal was reviewed for compliance with *2012 International Fire Code (IFC)* and National Fire Protection Association (*NFPA)* standards as adopted by the Fort Lupton Fire Protection District, the City Council of Fort Lupton and the Weld County Commissioners. The following specific requirements and conditions shall be met prior to operations.

**Specific Requirements**

1. Any property owner or authorized agent who intends to conduct an operation or business, or install or modify systems and equipment which is regulated by this code, or to cause any such work to be done, shall first make application to the fire code official and obtain the required permit.

2. Application for a permit required by this code shall be made to the fire code official in such form and detail as prescribed by the fire code official. Applications for permits shall be accompanied by such plans as prescribed by the fire code official.

    a. *The plan review, Fee Schedule, and Plan Review Application can be found at https://fortluptonfire.org/contractors/*

    b. *All documents shall be electronic and sent to ttamlin@ftluptonfire.com*

3. The following items shall be submitted for review prior to construction.
    a. Site Plan showing,
        i. Width of fire department access roads
        ii. Hydrant Locations & Distancing
        iii. Street lengths to dead end
        iv. Describe how Section D107.1 below has been met.

4. Where a fire hydrant is located on a fire apparatus access road, the minimum road width shall be 26 feet (7925 mm), exclusive of shoulders and parking areas.

5. The minimum turning radius shall be determined by the fire code official. 2012 IFC, D103.3
    a. See attached document showing the minimum turning radius needed.

6. The minimum fire-flow and flow duration requirements for one- and two-family dwellings having a fire-flow calculation area that does not exceed 3,600 square feet (344.5 m2) shall be 1,000 gallons per minute (3785.4 L/min) for 1 hour. Fire-flow and flow duration for dwellings having a fire-flow calculation area in excess of 3,600 square feet (344.5m2) shall not be less than that specified in Table B105.1.

    a. Exception: A reduction in required fire-flow of 50 percent, as approved, is allowed when the building is equipped with an approved automatic sprinkler system.

7. The minimum number of fire hydrants available to a building shall not be less than that listed in Table C105.1. The number of fire hydrants available to a complex or subdivision shall not be less than that determined by spacing requirements listed in Table C105.1 when applied to fire apparatus access roads and perimeter public streets from which fire operations could be conducted.

8. Developments of one- or two-family dwellings where the number of dwelling units exceeds 30 shall be provided with two separate and approved fire apparatus access roads and shall meet the requirements of Section D104.3.

Exceptions:

1. Where there are more than 30 dwelling units on a single public or private fire apparatus access road and all dwelling units are equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3 of the International Fire Code, access from two directions shall not be required.

2. The number of dwelling units on a single fire apparatus access road shall not be increased unless fire apparatus access roads will connect with future development, as determined by the fire code official.

9. Where two fire apparatus access roads are required, they shall be placed a distance apart equal to not less than one half of the length of the maximum overall diagonal dimension of the lot or area to be served, measured in a straight line between accesses.

10. Where the vertical distance between the grade plane and the highest roof surface exceeds 30 feet (9144 mm), approved aerial fire apparatus access roads shall be provided. For purposes of this section, the highest roof surface shall be determined by measurement to the eave of a pitched roof, the intersection of the roof to the exterior wall, or the top of parapet walls, whichever is greater.

*11.* New and existing buildings shall have approved address numbers, building numbers or approved building identification placed in a position that is plainly legible and visible from the street or road fronting the property. These numbers shall contrast with their background. Where required by the fire code official, address numbers shall be provided in additional approved locations to facilitate emergency response. Address numbers shall be Arabic numbers or alphabetical letters. Numbers shall be a minimum of 4 inches (101.6 mm) high with a minimum stroke width of 0.5 inch (12.7 mm). Where access is by means of a private road and the building

cannot be viewed from the public way a monument, pole or other sign or means shall be used to identify the structure. Address numbers shall be maintained.

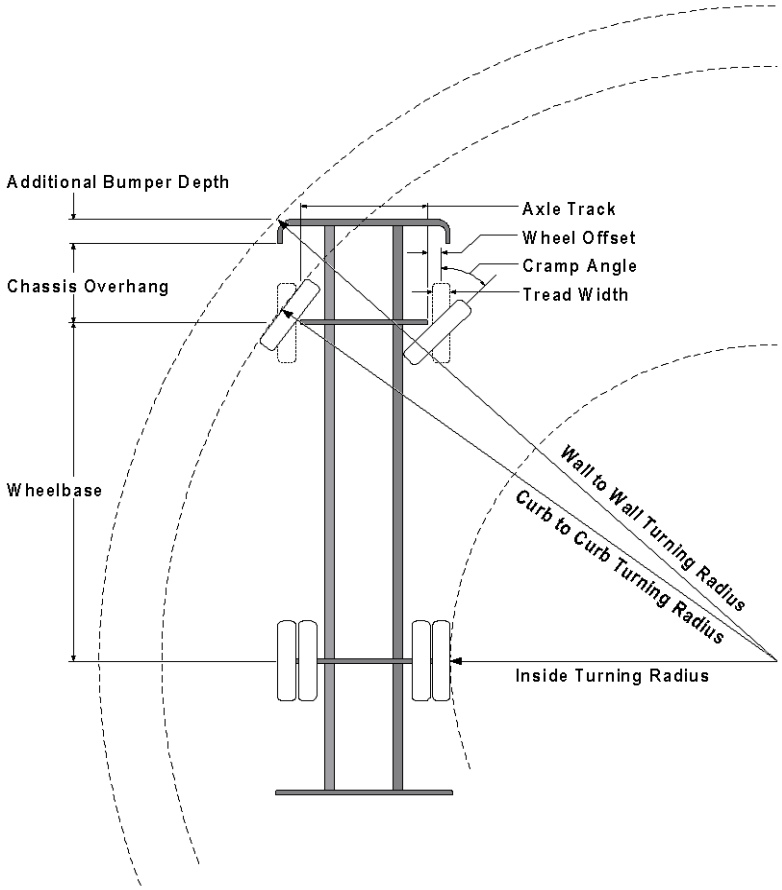
Please contact Fire Marshal, Taw Tamlin at 303-857-4603 or ttamlin@ftluptonfire.com if you have questions or need further assistance.

# Turning Performance Analysis

12/6/2012

**Bid Number:** 299
**Department:**

**Chassis:** Arrow-XT Chassis, PAP/SkyArm/Midmount MUX, 2010
**Body:** Aerial, Platform 100', Alum Body




**Parameters:**

| | |
|---|---|
| Inside Cramp Angle: | 45° |
| Axle Track: | 82.92 in. |
| Wheel Offset: | 5.25 in. |
| Tread Width: | 17.4 in. |
| Chassis Overhang: | 68.99 in. |
| Additional Bumper Depth: | 19 in. |
| Front Overhang: | 156.6 in. |
| Wheelbase: | 247 in. |

**Calculated Turning Radii:**

| | |
|---|---|
| Inside Turn: | 19 ft. 5 in. |
| Curb to curb: | 35 ft. 6 in. |
| Wall to wall: | 44 ft. 2 in. |

**Comments:**

| CategoryID | Category Description | OptionCode | OptionDescription |
|---|---|---|---|
| 6 | Axle, Front, Custom | 0018453 | Axle, Front, Oshkosh TAK-4, Non Drive, 22,800 lb, DLX/Enf/Qtm/AXT |
| 30 | Wheels, Front | 0001656 | Wheels, Front, 22.50" x 12.25", Steel, Hub Pilot |
| 31 | Tires, Front | 0594821 | Tires, Front, Goodyear, G296 MSA, 425/65R22.50, 20 ply |
| 38 | Bumpers | 0550016 | Bumper, 19" Extended, AXT, Dash CF |
| 437 | Aerial Devices | 0592931 | Aerial, 100' Pierce Platform, 50 MPH Wind Rating, 150lb Tip Load Allowance |

**Notes:**

Actual Inside Cramp Angle may be less due to highly specialized options.

Curb to Curb turning radius calculated for a 9.00 inch curb.

# Turning Performance Analysis

12/6/2012

**Bid Number:** 299
**Department:**

**Chassis:** Arrow-XT Chassis, PAP/SkyArm/Midmount MUX, 2010
**Body:** Aerial, Platform 100', Alum Body

**Definitions:**

| | |
|---|---|
| Inside Cramp Angle | Maximum turning angle of the front inside tire. |
| Axle Track | King-pin to King-pin distance of the front axle. |
| Wheel Offset | Offset from the center-line of the wheel to the king-pin. |
| Tread Width | Width of the tire tread. |
| Chassis Overhang | Distance of the center-line of the front axle to the front edge of the cab. This does not include the bumper depth. |
| Additional Bumper Depth | Depth that the bumper assembly adds to the front overhang. |
| Wheelbase | Distance between the center lines of the vehicle's front and rear axles. |
| Inside Turning Radius | Radius of the smallest circle around which the vehicle can turn. |
| Curb to Curb Turning Radius | Radius of the smallest circle inside of which the vehicle's tires can turn. This measurement assumes a curb height of 9 inches. |
| Wall to Wall Turning Radius | Radius of the smallest circle inside of which the entire vehicle can turn. This measurement takes into account any front overhang due to chassis,bumper extensions and/or aerial devices. |

Know what's below. Call before you dig.

UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, JR ENGINEERING APPROVES THEIR USE ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

PREPARED FOR
LUPTON LAND, LLC
10221 PRESTWICK TRAIL
LONE TREE, CO 80124
BOB QUINETTE
303-587-1966

J·R ENGINEERING
A Westrian Company
Centennial 303-740-9393 • Colorado Springs 719-593-2593
Fort Collins 970-491-9888 • www.jrengineering.com

Dead-end fire apparatus access roads in excess of 150 feet (45 720 mm) shall be provided with width and turnaround provisions in accordance with Table D103.4 fond in referral letter.

TWOMBLY ELEMENTERY SCHOOL
SCHOOL DISTRICT RE-8
301 REYNOLDS ST
FORT LUPTON, CO 80621
PARCEL # 147105100056

SANITARY SEWER LIFT STATION
REC. NO. 2551052

LOGAN WAY

RAFFI ROAD

LUPTON LANE

4TH STREET

TRACT A 7,346 SF 0.1686 AC
TRACT B 32,757 SF 0.7520 AC
TRACT C 1,603 SF 0.0368 AC
TRACT D 8,203 SF 0.1883 AC
TRACT E 7,183 SF 0.1649 AC
TRACT F 44,224 SF 1.0152 AC

FORT LUPTON GOLF
2 CLUBHOUSE DR
FORT LUPTON, CO 80621
PARCEL # 147105100050

POINT OF BEGINNING

C 1/4 COR. SEC 5
T1N, R66W, 6TH PM
#6 REBAR
IN A RANGE BOX

E 1/4 COR. SEC 5
T1N, R66W, 6TH PM
3.25" ALUMINUM CAMP
STAMPED "LS13155"
IN A RANGE BOX

50 25 0 50 100
ORIGINAL SCALE: 1" = 50'

| LINE TABLE | | |
|---|---|---|
| LINE | BEARING | DISTANCE |
| L1 | S43°09'42"E | 9.51' |
| L2 | N62°50'48"E | 1.17' |
| L3 | S62°50'48"W | 8.14' |
| L4 | S62°52'38"W | 0.16' |
| L5 | N62°50'48"E | 1.29' |
| L6 | N27°09'12"W | 4.67' |
| L7 | N27°09'12"W | 4.67' |
| L9 | N45°59'10"W | 13.12' |

| CURVE TABLE | | | | |
|---|---|---|---|---|
| CURVE | DELTA | RADIUS | LENGTH | CHORD |
| C1 | 90°00'00" | 13.00' | 20.42' | S45°16'07"E 18.38' |
| C2 | 28°31'44" | 50.00' | 24.90' | N76°00'15"W 24.64' |
| C3 | 40°06'33" | 50.00' | 35.00' | N41°41'07"W 34.29' |
| C4 | 40°06'33" | 50.00' | 35.00' | N01°34'34"W 34.29' |
| C5 | 253°23'54" | 50.00' | 221.13' | N36°25'51"E 80.18' |
| C8 | 73°23'54" | 20.00' | 25.62' | N53°34'09"W 23.90' |
| C9 | 90°00'00" | 13.00' | 20.42' | S44°43'53"W 18.38' |
| C10 | 90°00'00" | 13.00' | 20.42' | N45°16'07"W 18.38' |
| C11 | 1°10'19" | 175.00' | 3.58' | N00°19'03"E 3.58' |
| C12 | 2°46'17" | 225.00' | 10.88' | N01°07'02"E 10.88' |
| C13 | 13°56'57" | 225.00' | 54.78' | N09°28'39"E 54.64' |
| C14 | 38°23'55" | 175.00' | 117.28' | N20°06'10"E 115.10' |
| C15 | 63°06'55" | 175.00' | 192.77' | N31°17'21"E 183.17' |
| C17 | 63°06'55" | 225.00' | 247.85' | N31°17'21"E 235.51' |
| C18 | 13°58'29" | 225.00' | 54.88' | N23°26'23"E 54.74' |
| C19 | 8°00'31" | 225.00' | 31.45' | N34°25'53"E 31.42' |
| C20 | 13°41'21" | 225.00' | 53.76' | N45°16'49"E 53.63' |
| C21 | 23°32'40" | 175.00' | 71.91' | N51°04'28"E 71.41' |
| C22 | 10°43'19" | 225.00' | 42.10' | N57°29'09"E 42.04' |
| C23 | 23°30'43" | 150.00' | 61.55' | S51°05'27"W 61.12' |

| CURVE TABLE | | | | |
|---|---|---|---|---|
| CURVE | DELTA | RADIUS | LENGTH | CHORD |
| C24 | 29°55'48" | 150.00' | 78.36' | S47°52'54"W 77.47' |
| C25 | 6°25'05" | 150.00' | 16.80' | S36°07'33"W 16.79' |
| C26 | 27°40'04" | 32.00' | 15.45' | S19°04'59"W 15.30' |
| C27 | 17°37'16" | 36.00' | 11.07' | N14°03'35"E 11.03' |
| C28 | 23°08'19" | 145.00' | 58.56' | S11°18'03"W 58.16' |
| C29 | 24°48'28" | 205.00' | 88.76' | S12°08'07"W 88.07' |
| C30 | 27°59'58" | 42.00' | 20.52' | S38°32'20"W 20.32' |
| C31 | 20°50'59" | 15.00' | 5.46' | N42°06'50"E 5.43' |
| C32 | 9°23'19" | 200.00' | 32.77' | S36°22'59"W 32.74' |
| C34 | 31°09'28" | 200.00' | 108.76' | S47°16'04"W 107.43' |
| C35 | 21°46'10" | 200.00' | 75.99' | S51°57'44"W 75.53' |
| C36 | 90°00'00" | 13.00' | 20.42' | N17°50'48"E 18.38' |
| C37 | 90°00'00" | 13.00' | 20.42' | S44°43'53"W 18.38' |
| C37 | 90°00'00" | 13.00' | 20.42' | S72°09'12"E 18.38' |
| C38 | 26°53'05" | 175.00' | 82.11' | S13°42'39"E 81.36' |
| C40 | 10°34'57" | 225.00' | 41.56' | S21°51'43"E 41.50' |
| C41 | 26°53'05" | 225.00' | 105.58' | S13°42'39"E 104.61' |
| C42 | 15°29'53" | 225.00' | 60.86' | S08°49'19"E 60.67' |
| C43 | 0°48'16" | 225.00' | 3.16' | S00°40'14"E 3.16' |

| No. | REVISION | BY | DATE |
|---|---|---|---|

H-SCALE 1"=50'
V-SCALE 1"=X'
DATE 12/13/21
DESIGNED BY ANI
DRAWN BY ANI
CHECKED BY

# COYOTE CREEK FILING NO. 4
## PUD FINAL PLAT

SHEET 4 OF 46
JOB NO. 16093.00

## Magaly Morales-Tejada

**From:** Jake Freier
**Sent:** Tuesday, January 4, 2022 10:21 AM
**To:** Magaly Morales-Tejada
**Cc:** Maria Lancto; Todd Hodges; Alyssa Knutson; Roy Vestal
**Subject:** RE: Referral Response Request - Coyote Creek Filing No. 4 Preliminary and Final Plat (LUP2021-0032)

Magaly and Planning Staff,

Per our discussion in our staff meeting pertaining to the street names in Coyote Creek No. 4:

Before recording, the developer needs to work with staff to solidify the naming of streets in the subdivision. As of this moment, there is no duplication of the development's proposed street names. However, the names Logan and Lupton are currently reserved as part of a proposed street naming strategy for the outlying arterial County Roads. We request that these street names be changed before recording of the plat.

Furthermore, we request that north-south oriented streets be called "Avenue" and east-west oriented streets be called "Street".

Thanks,
Jake Freier

**JAKE FREIER, GISP**
*GIS Specialist*
City of Fort Lupton

720-466-6115 (office)
303-720-5155 (cell)
jfreier@fortluptonco.gov

130 S. McKinley Ave.
Fort Lupton, CO 80621
www.fortluptonco.gov

---

**From:** Magaly Morales-Tejada <MMTejada@Fortluptonco.gov>
**Sent:** Monday, December 13, 2021 11:09 AM
**Cc:** Maria Lancto <MLancto@Fortluptonco.gov>; Todd Hodges <thodges@Fortluptonco.gov>; Alyssa Knutson <AKnutson@Fortluptonco.gov>
**Subject:** Referral Response Request - Coyote Creek Filing No. 4 Preliminary and Final Plat (LUP2021-0032)

Good Morning,

The documentation located at the following link is submitted to you for review and recommendation for a preliminary and final plat being reviewed by the City of Fort Lupton. The application documents can be reviewed at the following link: https://www.fortlupton.org/DocumentCenter/Index/643.

Any comments you consider relevant to this request would be appreciated. Please reply by **January 3, 2022**, so that we may give full consideration to your recommendation. Any response not received before or on this date may be deemed to be a favorable response to the Planning & Building Department.

The Public Hearings for this matter are scheduled for:

- Planning Commission: Thursday, January 13, 2022 at 6:00 PM; and
- City Council: Tuesday, February 1, 2022 at 7:00 PM

Your time in this matter is greatly appreciated!

**Magaly Morales-Tejada**
**Planning assistant**
130 S. McKinley Ave.
Fort Lupton, CO 80621
Direct: 720-466-6111

## Magaly Morales-Tejada

**From:** Tyler Tarpley
**Sent:** Tuesday, January 4, 2022 11:05 AM
**To:** Todd Hodges; Magaly Morales-Tejada
**Subject:** Coyote Creek Filing 4

Hi Todd and Megaly,

As we discussed on the phone, I have some concerns about the setbacks and the general issue of golf balls and houses. It appears the setbacks are too close and will result in issues similar to what we have seen in the past. We also have a rain shelter that is partially off our property, will that need to be removed? Finally, construction wise we need to plan that the construction process and planning will include Mike Mcnay and myself to ensure the flow of golfers as well as golf course equipment (irrigation equipment) is not disturbed.

Thanks!

Tyler Tarpley, PGA
*General Manager*
Coyote Creek Golf Course
Office: 720-466-6189
Pro Shop: 303-857-6152

## Magaly Morales-Tejada

**From:** John Fryar
**Sent:** Monday, December 13, 2021 12:02 PM
**To:** Magaly Morales-Tejada
**Subject:** RE: Referral Response Request - Coyote Creek Filing No. 4 Preliminary and Final Plat (LUP2021-0032)

I don't see any LE issues.

Chief John Fryar

---

**From:** Magaly Morales-Tejada <MMTejada@Fortluptonco.gov>
**Sent:** Monday, December 13, 2021 11:09 AM
**Cc:** Maria Lancto <MLancto@Fortluptonco.gov>; Todd Hodges <thodges@Fortluptonco.gov>; Alyssa Knutson <AKnutson@Fortluptonco.gov>
**Subject:** Referral Response Request - Coyote Creek Filing No. 4 Preliminary and Final Plat (LUP2021-0032)

Good Morning,

The documentation located at the following link is submitted to you for review and recommendation for a preliminary and final plat being reviewed by the City of Fort Lupton. The application documents can be reviewed at the following link: https://www.fortlupton.org/DocumentCenter/Index/643.

Any comments you consider relevant to this request would be appreciated. Please reply by **January 3, 2022**, so that we may give full consideration to your recommendation. Any response not received before or on this date may be deemed to be a favorable response to the Planning & Building Department.

The Public Hearings for this matter are scheduled for:

- Planning Commission: Thursday, January 13, 2022 at 6:00 PM; and
- City Council: Tuesday, February 1, 2022 at 7:00 PM

Your time in this matter is greatly appreciated!

**Magaly Morales-Tejada**
**Planning assistant**
130 S. McKinley Ave.
Fort Lupton, CO 80621
Direct: 720-466-6111

CITY OF
Fort Lupton
EST 1836

Public Works

130 S. McKinley Avenue
Fort Lupton, CO 80621
Phone: 303.857.6694
Fax: 303.857.0351
www.fortluptonco.gov

MEMO

To: Todd Hodges
Alyssa Knutson
CC: Andrew Hugill (JR Engineering)

From: Roy Vestal

Date: December 29, 2021

Subject: Coyote Creek Filing No. 4 Preliminary and Final Plat (LUP2021-0032)
Public Works Review

---

Public Works has reviewed the submitted documents for the above referenced development project with the following comments for inclusion with the Final Plat submittal. Be advised, review of construction drawings is for general compliance with city standards. There may be additional concerns as this design develops.

1. **Plat**
   a. The existing utilities in 9th Street - Line labeled as IRR is the gravity potable water main. The existing water lines at 9th Street and College need to be sorted out. The nonpotable well line is not connecting to the indicated water line (see attached).

2. **Site Plan**
   a. The water line will require an easement dedication, 20' wide.
   b. Site Plan A-1 – Please move the gate from 14th Street entry to the property line. Need to leave adequate room for truck to park out of the street to open gate.

3. **Drainage**
   a. Final Drainage Study as submitted is acceptable.
   b. The low point at 4th Street on the golf course may include a culvert. We need to include a tie-in with your inlet just north of 4th Street.

4. **Transportation**
   a. The Traffic Study as submitted is acceptable.

5. **Landscape / Grading** - *Chapter 2 Design Standards*
   a. A SWMP and Stormwater Discharge permit must be acquired from CDPH&E. Please submit proof of prior to receiving construction permits. Please provide copy of permit from CDPH&E.

b. Grading offsite to the north shall be coordinated and approved with RE-8 School District.
c. Review proposed landscape plans at street locations and evaluate for sight triangle conflicts.

**6. Utilities**

a. **Utility Study**
   i. Pg 3 - delete any discussion of interconnect of nonpotable and potable water mains
   ii. Please include a network hydraulic modeling of the proposed development. We need to ensure the distribution system proposed will be adequate for future city growth.

**b. Water - Chapter 3**
   i. You may want to place the PRV on the south side of the development off of the connection to 4th Street. The pressures in the high pressure line throughout Coyote Creek require individual PRV's at each house. Regulating the pressure to the 9th Street line pressure should eliminate this requirement for each lot.
   ii. Sht 10 - Interconnect between nonpotable and potable water mains is not allowed. Please remove.
   iii. Section 3.21.00 Water service lines shall be located a minimum of 10 feet away from all sewer services and a minimum of 5 feet away from all fire protection service lines (measured horizontally). All service lines shall be constructed perpendicular to the front property line of the property they are going to serve and not less than 5 feet from the side of a front property line.
   iv. Please specify pipe materials on the drawings. DIP as labeled is OK, but you may find PVC C900 for water lines less expensive.
   v. Specify "Red Mueller Super Centurion" hydrants in final construction drawings.
   vi. Sht 17 - Caution on service locations, Meter pits shall not be located in the driveway concrete. Water service must maintain a 10-feet separation from IRR. The ones I checked look good, but don't let the contractor get sloppy. Be sure builder's site plans will accommodate the driveway without getting within 4-feet of driveway.

**c. Non Potable Irrigation**
   i. Where possible, the irrigation line should maintain a 10-feet separation from sanitary. Where there is not room, the irrigation line may be closer to the sanitary, but always the potable water main requires 10-feet separation.
   ii. Cross connection interconnect to the potable water main is not allowed.

iii. Designate material as "PURPLE PIPE". May be HDPE or PVC C900 same standards as potable water lines. Service lines to be purple tubing.
iv. The main feed must be from a master metered vault location.

**d. Storm Sewer - Chapter 5**

i. If there is any way to reconfigure Logan and Raffi to allow better separation between irrigation line and sanitary sewer would be appreciated. Consider south inlet connect to north inlet

**e. Roadway - Chapter 6**

i. Preliminary Soils Report indicates presence of swelling soils, collapsible soils and shallow groundwater. The recommendations from the 2002 report were not greatly successful in this area. The pavement Design report will be required prior to paving. Soil stabilization measures will be required and a composite section for the pavement required.

**f. Traffic Control - Chapter 8**

i. The Traffic Study as submitted is acceptable.
ii. Sht 22 - Add City standard street sign. - City street sign standard is New City street signs are 2-sided Engineer Grade Reflective Aluminum, Green with white trim. I am attaching the City Logo

I have been ordering from RoadTrafficSigns.com

7. Final Construction Drawings should include City Standard Details as needed.
   a. Add standard detail W7, W8, W9 and W30.

8. **Public Improvement Agreement** – A Subdivision Improvements Agreement will be required for the construction of roadways, water, sewer and nonpotable water systems. See attached template.

9. A Geotechnical report for final pavement design will be required prior to paving.

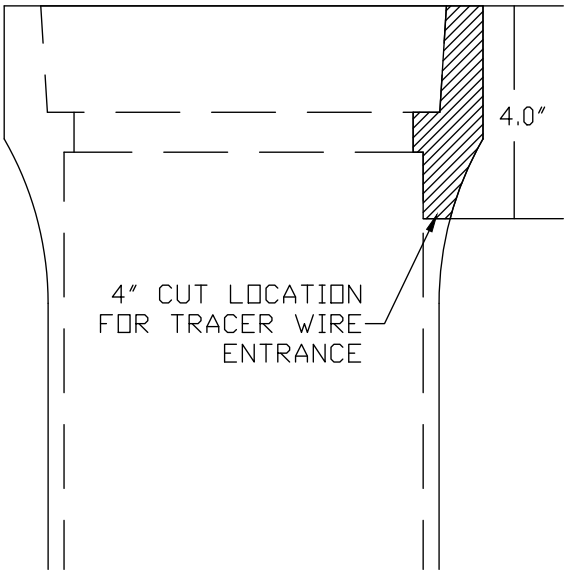
There may be additional concerns as this design develops.

# GENERAL NOTES

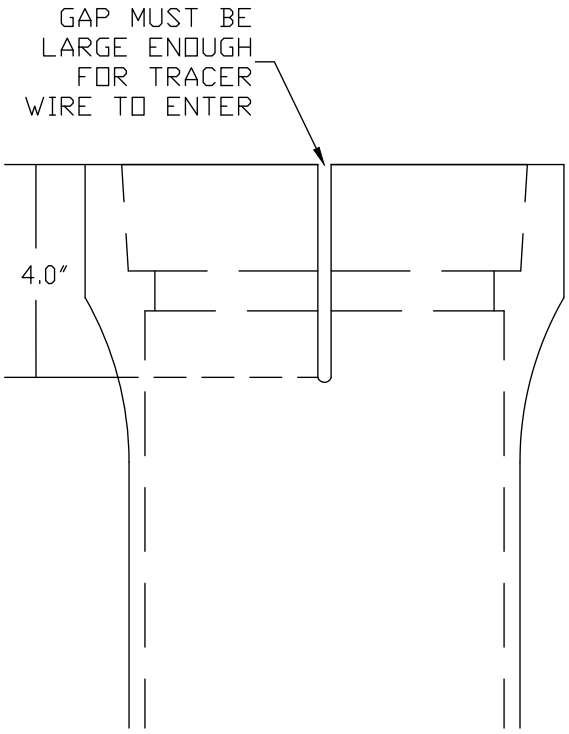
1. NOT FOR INSTALLATION IN ROADWAYS, DRIVEWAYS, PARKING AREAS, SIDEWALKS, OR CONCRETE. EDGE OF METER PIT LID SHALL NOT BE CLOSER THAN 4' FROM EDGE OF DRIVEWAY.
2. IF SURFACE IS NOT TO OFFICIAL GRADE WHEN THE METER IS INSTALLED, THE OWNER MUST RAISE OR LOWER THE PIT, METER SETTER AND ALL OTHER APPURTENANCES TO THE FINAL APPROVED GRADE.
3. METER SHALL BE SET WITHIN PUBLIC R.O.W OR PUBLIC EASEMENT.
4. NO CONCRETE FLOOR TO BE LAID IN METER PIT.
5. METER PIT SHALL BE CONSTRUCTED OF MODIFIED HI-DENSITY POLYETHELENE.
6. ADJUSTMENT RINGS SHALL BE 2", 3", 4" OR 6" IN HEIGHT AND SHALL BE INSERTED ABOVE THE POLYETHYLENE METER PIT.
7. FOR WATER SERVICE LINES 1" AND LARGER: IF THE METER PIT IS NOT INSTALLED WITHIN THE PUBLIC R.O.W. THEN A CURB STOP AND BOX SHALL BE INSTALLED WITHIN THE PUBLIC R.O.W.



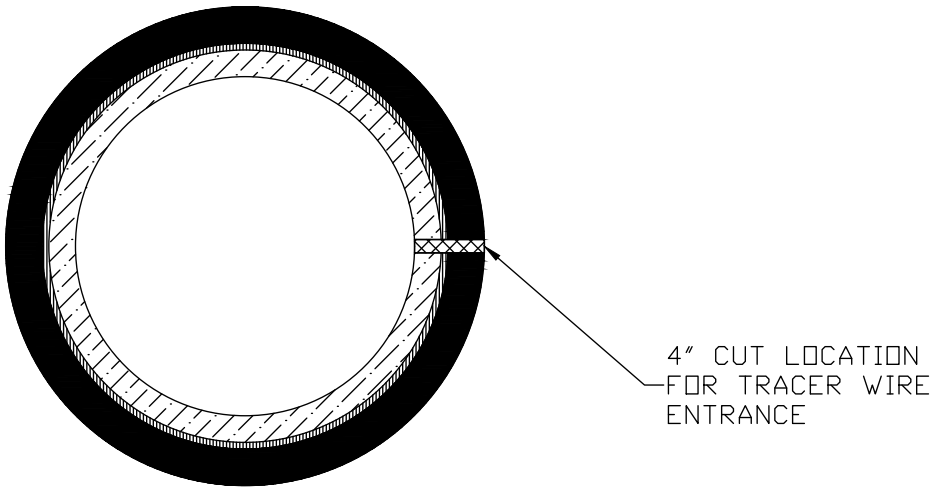
| CITY OF Fort Lupton EST 1836 COME PAINT YOUR FUTURE WITH US | DESIGN STANDARDS | STANDARD DRAWING |
|---|---|---|
| | 3/4" & 1" METER NOTES | W9 |
| | | DATE: 8/15/14 |




FRONT VIEW



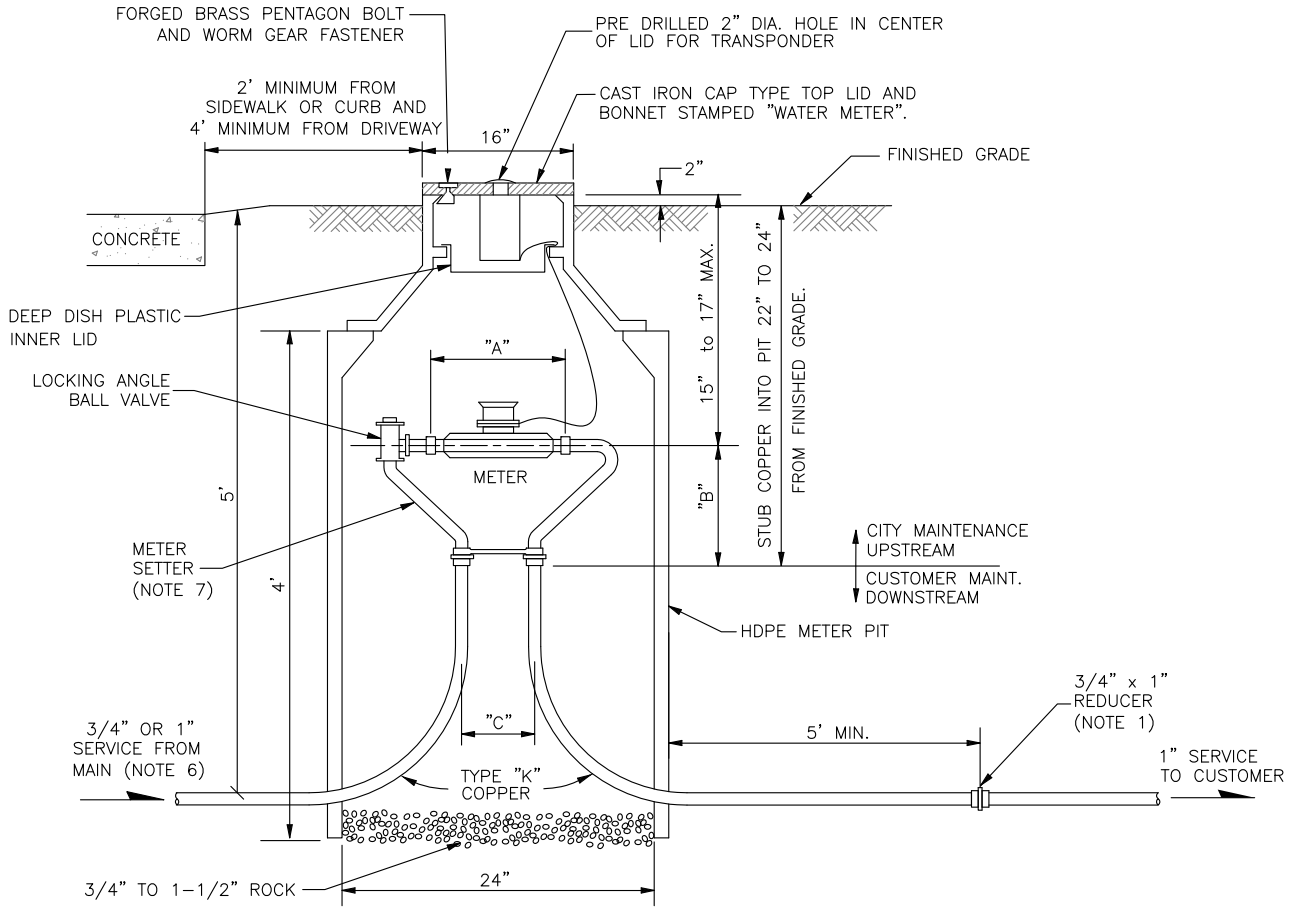

SIDE VIEW




TOP VIEW

CITY OF Fort Lupton EST 1836
COME PAINT YOUR FUTURE WITH US

| DESIGN STANDARDS | STANDARD DRAWING |
|---|---|
| TRACER WIRE FOR VALVES | W7a |
| | DATE: 11/28/14 |

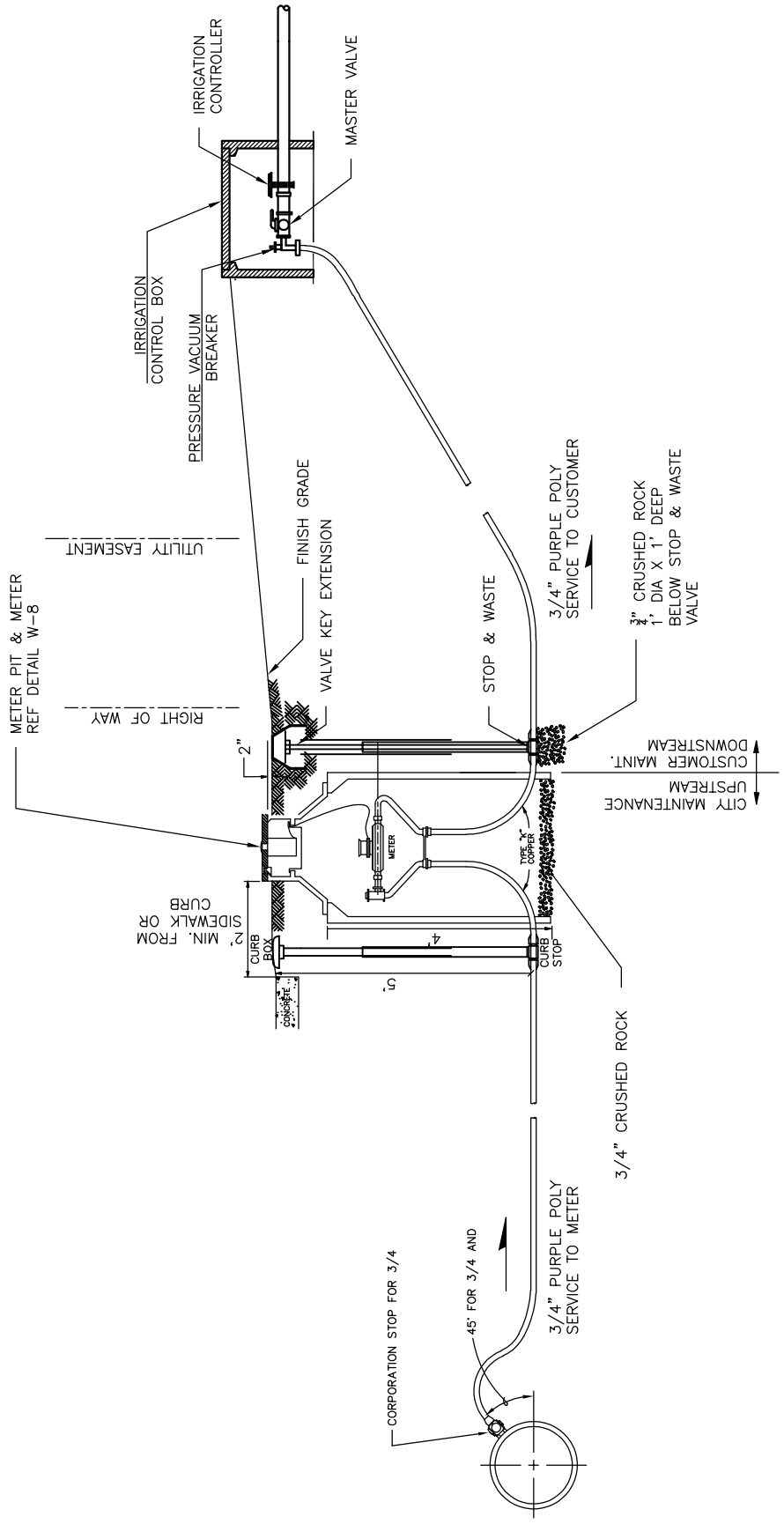



| METER SIZE | A | B | C |
|---|---|---|---|
| 3/4" | 9" | 9" | 5" |
| 1" | 10-3/4" | 10" | 6" |

NOTES:

1. UPSIZING OF SERVICE PIPES AFTER THE METER REQUIRES THE APPROVAL OF THE BUILDING DEPARTMENT. FOR SERVICE PIPES UPSIZED FROM 3/4" TO 1", A REDUCER SHALL BE INSTALLED AS SHOWN ON THIS DETAIL.
2. ONLY COMPRESSION FITTINGS WILL BE ALLOWED ON COPPER SERVICE PIPES. FOR APPROVED MANUFACTURERS AND MODEL NUMBERS OF FITTINGS, REFER TO CHAPTER 3 OF THE CITY STANDARDS.
3. THIS DETAIL IS NOT INTENDED FOR INSTALLATION IN STREETS, DRIVEWAYS, OR CONCRETE AREAS.
4. METER PIT SHALL NE LOCATED IN A SOD OR MULCH AREA WITH A 10' MIN. WIDTH UTILITY EASEMENT. NO TREES, SHRUBS, OR STRUCTURES SHALL BE LOCATED IN THE EASEMENT.
5. SERVICE LINES TO THE METER PIT SHALL BE INSTALLED PERPENDICULAR TO THE WATER MAIN.
6. FOR 3/4" RESIDENTIAL METER INSTALLATIONS, NEWLY INSTALLED SERVICE LINES FROM MAIN SHALL BE 1". EXISTING 3/4" SERVICE LINES MUST BE REVIEWED AND APPROVED FOR CONFORMANCE WITH RESIDENTIAL FIRE SPRINKLER SYSTEM REQUIREMENTS.
7. PROPER METER SETTERS SHALL BE INSTALLED TO ACCOMMODATE SERVICE LINE SIZES FROM MAIN AND TO CUSTOMER. REFER TO SECTION 3.63.08 OF THE CITY WATER SYSTEM STANDARDS FOR ACCEPTABLE SETTER MODEL NUMBERS.

| CITY OF Fort Lupton EST 1836 COME PAINT YOUR FUTURE WITH US | DESIGN STANDARDS | STANDARD DRAWING |
|---|---|---|
| | 3/4" & 1" DOMESTIC METER SETS | W8 |
| | | DATE: 8/15/14 |




NOTES:

1. IRRIGATION METER PIT SHALL BE LOCATED IN A LANDSCAPE AREA WITHIN THE RIGHT-OF-WAY. NO TREES, SHRUBS, OR STRUCTURES SHALL BE LOCATED WITHIN 5-FEET.
2. SERVICE LINES TO THE METER PIT SHALL BE INSTALLED PERPENDICULAR TO THE NON-POTABLE WATER MAIN.
3. IRRIGATION SERVICE LINE WILL NOT ENTER THE STRUCTURE. NO CONNECTION TO POTABLE PLUMBING FIXTURES IS ALLOWED

CITY OF Fort Lupton EST 1836
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| DESIGN STANDARDS | STANDARD DRAWING |
|---|---|
| 3/4" & 1" IRRIGATION METER SETS | W30 |
| | DATE: 10/30/20 |

December 16, 2021

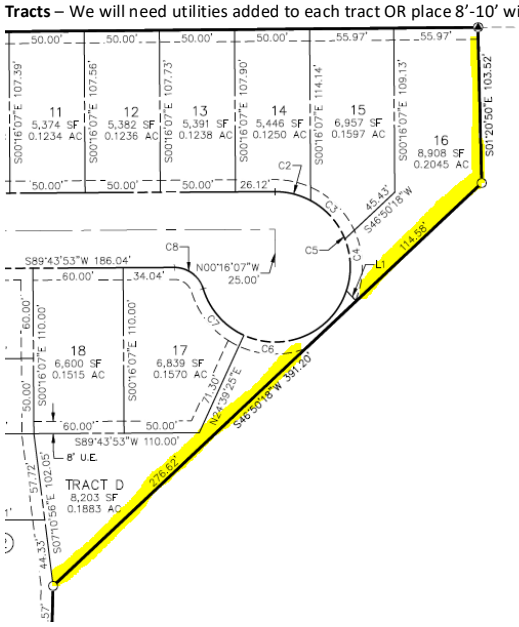
Fort Lupton Planning Department
130 S. McKinley Avenue
Fort Lupton, CO 80621
www.fortlupton.org

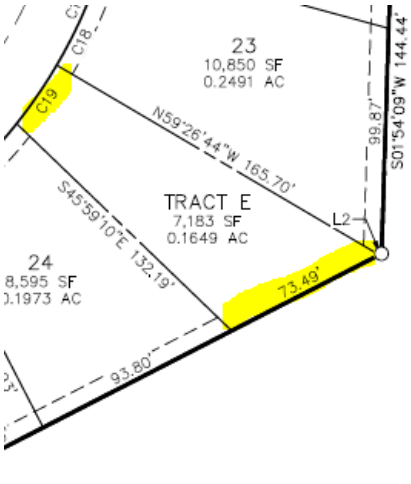
Re: Coyote Creek Filing No. 4 Preliminary and Final Plat (LUP2021-0032)

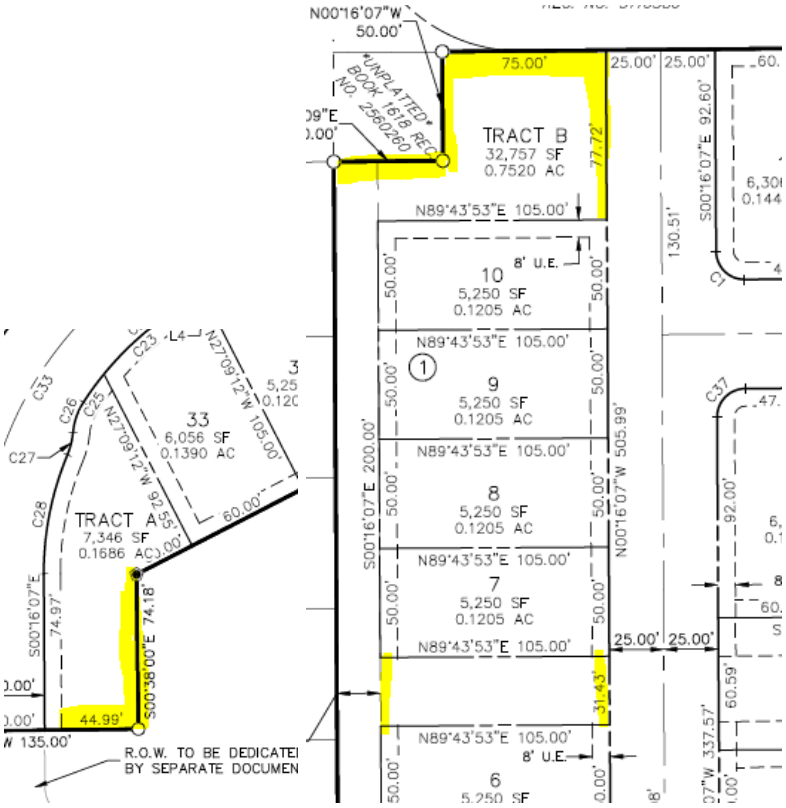
Dear Magaly Morales-Tejada:

On behalf of United Power, Inc., thank you for inviting us to review and comment on the Coyote Creek Filing No. 4 Preliminary and Final Plat (LUP2021-0032). After review of the information, we have the following comments:

- **Tracts** – We will need utilities added to each tract OR place 8'-10' wide dry utilities around the tracts – see pictures below.






- Easements utilized by United Power cannot be encumbered by any hard surfaces such as streets or sidewalks. Although the roadways/tracts on the plat are dedicated to utilities, we have above ground equipment that cannot be placed within these areas. In addition, sidewalks take away from the use of the easement & reduces the area, limiting where our equipment can be placed.

- **Tracts/Open Space/Parks** – United Power prefers dedicated blanket utility easement use within tracts as this gives us the opportunity to set above ground equipment, coordinated with the developer, and limit the impact to home lots. If Blanket utility easement(s) cannot be given, we will need a 10' to 12' wide dry utility easements along the perimeter of all tracts, along perimeter of tracts abutting roads, and through tracts between lots.

- **Streetlights** – When streetlight locations are identified in a subdivision, we need a 5' wide dry utility easement along one side of the lot closest to the streetlight location. All streetlight locations must be approved and signed off by the city/town, etc. Please note, if we do not get these through the platting process, we will have to get individual ones during the design which will slow United Power's ability to start construction significantly.

Please have the property owner/developer/contractor submit an application for new electric service, any modification to existing facilities including relocation and/or removal along with CAD data via https://www.unitedpower.com/construction. United Power would like to work with these persons early in the construction process on getting an electric design prepared so that we can request any additional easements needed and hopefully have those easements dedicated on the plat rather than obtaining separate instrument. Obtaining easements via a separate instrument can be time consuming and could cause delays.

***As a Reminder:*** No permanent structures are acceptable within the dry utility easement(s); such as, window wells, wing walls, retaining walls, basement walls, roof overhang, anything affixed to the house like decks, etc. United Power considers any structure that impedes the access, maintenance, and safety of our facilities a permanent structure. No exceptions will be allowed, and any encroachments could result in penalties.

Service will be provided according to the rules, regulations, and policies in effect by United Power at the time service is requested. We would like to remind the developer to call the Utility Notification Center by dialing 811 to have all utilities located prior to construction. We look forward to safely and efficiently providing reliable electric power and outstanding service.

Thank you,

Amber Mendoza
Amber Mendoza, RWA
ROW Agent
720.249.9315 | platreferral@unitedpower.com

**Right of Way & Permits**

1123 West 3rd Avenue
Denver, Colorado 80223
Telephone: **303.571.3306**
Facsimile: 303. 571. 3284
donna.l.george@xcelenergy.com

January 3, 2022

City of Fort Lupton Planning Department
130 South McKinley Avenue
Fort Lupton, CO 80621

Attn: Alyssa Knutson and Todd Hodges

**Re: Coyote Creek Filing No. 4, Case # LUP2021-0032**

Public Service Company of Colorado's (PSCo) Right of Way & Permits Referral Desk has reviewed the preliminary and final plat for **Coyote Creek Filing No. 4**.The property owner/developer/contractor must complete the application process for any new natural gas *service* via xcelenergy.com/InstallAndConnect. It is then the responsibility of the developer to contact the Designer assigned to the project for approval of design details.

If additional easements need to be acquired by separate PSCo document, a Right-of-Way Agent will need to be contacted.

PSCo also has existing electric *transmission* facilities and associated land rights abutting the west property line. Should there be any activities in this area, the property owner/developer/contractor must contact our Siting and Land Rights Department at either of the following:
website: www.xcelenergy.com/rightofway
email: coloradorightofway@xcelenergy.com

Donna George
Right of Way and Permits
Public Service Company of Colorado dba Xcel Energy
Office: 303-571-3306 – Email: donna.l.george@xcelenergy.com

CITY OF
Fort Lupton
EST 1836

Planning & Building

130 S. McKinley Avenue
Fort Lupton, CO 80621
Phone: 303.857.6694
Fax: 303.857.0351
www.fortluptonco.gov

**Sign Posting Affidavit**

Coyote Creek Filing No. 4 Preliminary and Final Plat
Project No. LUP2021-0032 Plan Nos. PPL2021-0005 & FPL2021-0006

Facing 4th St

Insert

Facing West

I, Bob Quinette hereby acknowledge that the aforementioned property was posted in accordance with City Codes. Said public hearing notice was posted on this 29th day of December, 2021.

Bob Quinette
Signature of Owner or Owner's Representative

The foregoing instrument was acknowledged before me by Robert Quinette, this 10th day of January, 2022. Witness my hand and seal.

My commission expires 06/22/2024.

Notary Public

(SEAL)

KARI WETZIG-SYE
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID 20204021499
MY COMMISSION EXPIRES 06/22/2024

Colorado Community Media
750 W. Hampden Ave. Suite 225
Englewood, CO 80110

City of Fort Lupton Legals***
130 S McKinley Avenue
Fort Lupton CO 80621

Description: FLP489 Public Hearing Notice - Coyote Creek

# AFFIDAVIT OF PUBLICATION

State of Colorado }
County of Weld } ss

This Affidavit of Publication for the Fort Lupton Press, a weekly newspaper, printed and published for the County of Weld, State of Colorado, hereby certifies that the attached legal notice was published in said newspaper once in each week, for 1 successive week(s), the last of which publication was made 12/29/2021, and that copies of each number of said paper in which said Public Notice was published were delivered by carriers or transmitted by mail to each of the subscribers of said paper, according to their accustomed mode of business in this office.

Linda C Shapley

For the Fort Lupton Press

State of Colorado }
County of Weld } ss

The above Affidavit and Certificate of Publication was subscribed and sworn to before me by the above named Linda Shapley, publisher of said newspaper, who is personally known to me to be the identical person in the above certificate on 12/29/2021. Linda Shapley has verified to me that she has adopted an electronic signature to function as her signature on this document.

20004025550-289673

Carla Bethke
Notary Public
My commission ends April 11, 2022

CARLA BETHKE
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID 20004025550
MY COMMISSION EXPIRES APRIL 11, 2022

**Public Notice**

**CITY OF FORT LUPTON**
**NOTICE OF PUBLIC HEARING**

Notice is hereby given that the City of Fort Lupton is in receipt of an application for a Preliminary and Final Plat known as the Coyote Creek Filing No. 4 Preliminary and Final Plat, located approximately 0.11 miles south of 9th St. and approximately 0.25 miles west of Northrup Avenue within the City of Fort Lupton, pursuant to the City of Fort Lupton Municipal Code Notice Requirements.

The public hearings are to be held before the Planning Commission **on Thursday, January 13, 2022, at 6:00 P.M.**, and before the City Council **on Tuesday, February 1, 2022, at 7:00 P.M.** or as soon as possible thereafter.

The public hearings shall be held at the Fort Lupton City Hall, 130 S. McKinley Avenue in Fort Lupton, Colorado. In the event that the City Hall is closed at the time of the hearings, the public hearings will be held remotely, accessible to the public by phone and internet. Information on how to attend the hearings will be provided in the agenda as posted on the City's website, www.fortluptonco.gov.

Further information is available through the City Planning and Building Department at (303) 857-6694.

**ALL INTERESTED PERSONS MAY ATTEND**

**LEGAL DESCRIPTION**

A PORTION OF LAND IN THE CITY OF FORT LUPTON, COLORADO, LOCATED IN THE NORTHEAST QUARTER OF SECTION 5, TOWNSHIP 1 NORTH, RANGE 66 WEST OF THE 6TH PRINCIPAL MERIDIAN, AND MORE PARTICULARLY DESCRIBED AS FOLLOWS:
BASIS OF BEARINGS: THE WEST LINE OF THE NORTHEAST QUARTER OF SECTION 5, TOWNSHIP 1 NORTH, RANGE 66 WEST OF THE 6TH PRINCIPAL MERIDIAN, BEING MONUMENTED AT THE CENTER 1/4 CORNER BY A 3-1/4" ALUMINUM CAP STAMPED "LS 13155" AND AT THE NORTH 1/4 CORNER BY A 3-1/4" ALUMINUM CAP STAMPED "LS 14823" BEARING N00°16'07" A DISTANCE OF 2595.44 FEET AS REFERENCED TO COLORADO STATE PLANE NORTH ZONE. NAD(83).
COMMENCING AT CENTER 1/4 CORNER OF SECTION 5, TOWNSHIP 1 NORTH, RANGE 66 WEST OF THE 6TH PRINCIPAL MERIDIAN;
THENCE ON THE WEST LINE OF THE NORTHEAST QUARTER OF SAID SECTION 5, N00°16'17" A DISTANCE OF 1,111.96 TO THE POINT OF BEGINNING;
THENCE CONTINUING ON SAID WEST LINE, N00°16'07"W A DISTANCE OF 833.49 FEET, TO A POINT ON THE SOUTHERLY LINE OF THAT LIFT STATION SITE RECORDED IN BOOK 1618 AT RECEPTION NO. 2560260, IN THE RECORDS OF THE WELD COUNTY CLERK AND RECORDER;
THENCE ON THE SOUTHERLY AND EASTERLY LINES OF SAID LIFT STATION SITE, THE FOLLOWING TWO (2) COURSES:
1. N89°32'09"E A DISTANCE OF 50.00 FEET;
2. N00°16'07"W A DISTANCE OF 50.00 FEET, TO A POINT ON THE SOUTHERLY LINE OF THE TWOMBLY SCHOOL PROPERTY RECORDED IN BOOK 990 RECEPTION NOS. 1919362-1919366;
THENCE ON SAID SOUTHERLY LINE, N89°32'09"E A DISTANCE OF 961.94 FEET;
THENCE DEPARTING SAID SOUTHERLY LINE, THE FOLLOWING SIX (6) COURSES:
1. S01°20'50"E A DISTANCE OF 103.52 FEET;
2. S46°50'18"W A DISTANCE OF 391.20 FEET;
3. S01°54'09"W A DISTANCE OF 144.44 FEET;
4. S62°50'48"W A DISTANCE OF 658.46 FEET;
5. S00°38'00"E A DISTANCE OF 74.18 FEET;
6. S89°20'49"W A DISTANCE OF 135.00 FEET, TO THE POINT OF BEGINNING.

CONTAINING A CALCULATED AREA OF 574,520 SQUARE FEET OR 13.1892 ACRES.

Legal Notice No. FLP489
First Publication: December 29, 2021
Last Publication: December 29, 2021
Publisher: Fort Lupton Press

CITY OF
Fort Lupton
EST 1836
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## CERTIFICATE OF MAILING

I, the undersigned, hereby certify that on the 22nd day of December 2021, a true and correct copy of the foregoing Notice of Public Hearings and Map for the Sagebrush Apartments Site Plan was sent via U.S. Mail, postage pre-paid, to the following addresses:

ROWLEY DOWNS LAND COMPANY
260 KRAMERIA ST
DENVER, CO 80220

SCHOOL DISTRICT RE-8
301 REYNOLDS ST
FORT LUPTON, CO 80621

SARAH J FRANK
1659 WAGONWHEEL DR
FORT LUPTON, CO 80621

LUIS H SANDOVAL
1653 WAGONWHEEL DR
FORT LUPTON, CO 80621

PATRICK J MCLAIN
14924 VINE ST
THORNTON, CO 80602

NANCY D BONAR
1641 WAGONWHEEL DR
FORT LUPTON, CO 80621

RICHARD N OLIVER
1635 WAGONWHEEL DR
FORT LUPTON, CO 80621

JESUS A RIVERA
1629 WAGONWHEEL DR
FORT LUPTON, CO 80621

JASMINE C CARR
1623 WAGONWHEEL DR
FORT LUPTON, CO 80621

JOHN CAMERON WARMUTH
1617 WAGONWHEEL DR
FORT LUPTON, CO 80621

JAMES THURSTIN
1611 WAGONWHEEL DR
FORT LUPTON, CO 80621

ROBERT MACKELL
14005 DOGLEG LN
BROOMFIELD, CO 80023

KELLIE CELESTE WRIGHT
1599 WAGONWHEEL DR
FORT LUPTON, CO 80621

GILBERT DEHERRERA
1593 WAGONWHEEL DR
FORT LUPTON, CO 80621

TIMOTHY N TURNER
1587 WAGONWHEEL DR
FORT LUPTON, CO 80621

CRAIG HOWARD GIBBS
1581 WAGONWHEEL DR
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PAUL G PETIT
1575 WAGONWHEEL DR
FORT LUPTON, CO 80621

COLE JOSEPH LECHMAN
1569 4TH ST
FORT LUPTON, CO 80621

COYOTE CREEK MASTER ASSOCIATION
PO BOX 30
FREDERICK, CO 80530

PAUL R LUIZ
309 WAGONWHEEL DR
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SANDRA L SMITH
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DESTINY HILLIS
301 WAGONWHEEL DR
FORT LUPTON, CO 80621

JOHN M ROSS
297 WAGONWHEEL DR
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293 WAGONWHEEL DR
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RALPH C MATTHEWS
289 WAGONWHEEL DR
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THEODORE D WOODS
1604 WAGONWHEEL DR
FORT LUPTON, CO 80621

MANUEL J ORONA
1610 WAGONWHEEL DR
FORT LUPTON, CO 80621

PAOLA RAMIREZ
1616 WAGONWHEEL DR
FORT LUPTON, CO 80621

BRANDON S SIMMONS
1622 WAGONWHEEL DR
FORT LUPTON, CO 80621

THOMAS E LECHLEITNER
1628 WAGONWHEEL DR
FORT LUPTON, CO 80621

JEFFREY SCOTT COOKE
1634 WAGONWHEEL DR
FORT LUPTON, CO 80621

CARLOS J MORALES
1640 WAGONWHEEL DR
FORT LUPTON, CO 80621

CARRIE L MCBROOM
334 PONDEROSA PL
FORT LUPTON, CO 80621

ANTONIO PEREZ
303 BIGHORN TER
FORT LUPTON, CO 80621

BRIAN D CALZIA
1592 WAGONWHEEL DR
FORT LUPTON, CO 80621

CHRISTINA E MCCULLOUGH
1586 WAGONWHEEL DR
FORT LUPTON, CO 80621

OLIVIA LUNA
308 WAGONWHEEL DR
FORT LUPTON, CO 80621

CYNTHIA LANGLEY
304 WAGONWHEEL DR
FORT LUPTON, CO 80621

JULIE RENEE MERCADO
300 WAGONWHEEL DR
FORT LUPTON, CO 80621

KEITH VITALE
296 WAGONWHEEL DR
FORT LUPTON, CO 80621

DUMISANI OLIVER SIBANDA
1702 WAGONWHEEL DR
FORT LUPTON, CO 80621

JAMES BLUE
1723 HOMESTEAD DR
FORT LUPTON, CO 80621

TYLER JAMES PAGEL
1727 HOMESTEAD DR
FORT LUPTON, CO 80621

ISAAC LEON ESCOBEDO
1733 HOMESTEAD DR
FORT LUPTON, CO 80621

BRAEDEN H DOSCO
1737 HOMESTEAD DR
FORT LUPTON, CO 80621

CHARLES R MARTIN
1743 HOMESTEAD DR
FORT LUPTON, CO 80621

ABIU DELGADO
1747 HOMESTEAD DR
FORT LUPTON, CO 80621

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1753 HOMESTEAD DR
FORT LUPTON, CO 80621

MARTIN VIEROW
1757 HOMESTEAD DR
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1763 HOMESTEAD DR
FORT LUPTON, CO 80621

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FORT LUPTON, CO 80621

ALLEN BARTON
712 COPPER AVE
FORT LUPTON, CO 80621

JOSHUA THOMPSON
704 COPPER AVE
FORT LUPTON, CO 80621

CLARENCE JESS ISGAR
741 BETH AVE
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RONALD NASH
717 BETH AVE
FORT LUPTON, CO 80621

JAKEOB KIRKPATRICK
709 BETH AVE
FORT LUPTON, CO 80621

1413 7TH ST LLC
1536 MOUNT MEEKER AVE
BERTHOUD, CO 80513

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FORT LUPTON, CO 80621

MONTY VELASQUEZ
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FORT LUPTON, CO 80621

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COMMERCE CITY, CO 80022

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FORT LUPTON, CO 80621

JOE L PATE
520 BETH AVE
FORT LUPTON, CO 80621

MICHAEL T LONG
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FORT LUPTON, CO 80621

DANIEL A LECRONE
1408 4TH ST
FORT LUPTON, CO 80621

HENRY I FIELDS
1416 4TH ST
FORT LUPTON, CO 80621

CECILE JEAN PIERCE
1424 4TH ST
FORT LUPTON, CO 80621

VENESSA FOSTER
1425 4TH ST
FORT LUPTON, CO 80621

BRANDON C TURNER
1417 4TH ST
FORT LUPTON, CO 80621

LAURA E GONZALEZ
1409 4TH ST
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MARY SUSAN TORRES
1339 4TH ST
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DANIELLE RAE ROJAS
1331 4TH ST
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MANUEL B ARAGON
1332 5TH ST
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STEPHANIE M VALDEZ
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SALVADOR SERGIO CARO
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FORT LUPTON, CO 80621

PAULA K MCGUIGAN
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FORT LUPTON, CO 80621

ADRIAN VASQUEZ
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FORT LUPTON, CO 80621

TERAN MORRISON
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FORT LUPTON, CO 80621

EFREN MARTINEZ
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STEVEN MCGUINN
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FORT LUPTON, CO 80621

TYLER INGRAM
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FORT LUPTON, CO 80621

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FORT LUPTON, CO 80621

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FORT LUPTON, CO 80621

MARICELA PEÑA
1400 7TH ST
FORT LUPTON, CO 80621

HUMBERTO ROJAS
1408 7TH ST
FORT LUPTON, CO 80621

SEVERINA RETANA
1416 7TH ST
FORT LUPTON, CO 80621

CHRISTOPHER MAY
750 COPPER AVE
FORT LUPTON, CO 80621

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EST 1836
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MOLLIE ELLIS
504 BETH AVE
FORT LUPTON, CO 80621

JUAN M RAMOS
426 BETH AVE
FORT LUPTON, CO 80621

DAVID SANDOVAL OCHOA
418 BETH AVE
FORT LUPTON, CO 80621

BRENDA L WILLIS
410 BETH AVE
FORT LUPTON, CO 80621

KIETH JACKEL
402 BETH AVE
FORT LUPTON, CO 80621

MARK SHIBAO
316 BETH AVE
FORT LUPTON, CO 80621

ANTHONY P WOOGT
8990 LILLY DR
THORNTON, CO 80229

ROLANDO AGUILAR
300 BETH AVE
FORT LUPTON, CO 80621

PATRICIA B SUDHOLT
1457 3RD ST
FORT LUPTON, CO 80621

RODRIGO CHAVEZ
4490 OXBOW DR
BRIGHTON, CO 80601

ROBERTO MARTINEZ
1437 3RD ST
FORT LUPTON, CO 80621

MARK E BORNSCHEIN
1427 3RD ST
FORT LUPTON, CO 80621

DARNAY P UN
1436 3RD ST
FORT LUPTON, CO 80621

RUSSELL D MALLORY
1456 3RD ST
FORT LUPTON, CO 80621

MARY L ICKLER
1436 3RD ST
FORT LUPTON, CO 80621

YOHAIRA CASTEL CARMONA
212 BETH AVE
FORT LUPTON, CO 80621

JOSE G DIAZ
208 BETH AVE
FORT LUPTON, CO 80621

City Official

CITY OF
Fort Lupton
EST 1836

Planning & Building

130 S. McKinley Avenue
Fort Lupton, CO 80621
Phone: 303.857.6694
Fax: 303.857.0351
www.fortluptonco.gov

CITY OF FORT LUPTON
NOTICE OF PUBLIC HEARING

Notice is hereby given that the City of Fort Lupton is in receipt of an application for a Preliminary and Final Plat known as the Coyote Creek Filing No. 4 Preliminary and Final Plat, located approximately 0.11 miles south of 9th St. and approximately 0.25 miles west of Northrup Avenue within the City of Fort Lupton, pursuant to the City of Fort Lupton Municipal Code Notice Requirements.

The public hearings are to be held before the Planning Commission on Thursday, January 13, 2022, at 6:00 P.M., and before the City Council on Tuesday, February 1, 2022, at 7:00 P.M. or as soon as possible thereafter.

The public hearings shall be held at the Fort Lupton City Hall, 130 S. McKinley Avenue in Fort Lupton, Colorado. In the event that the City Hall is closed at the time of the hearings, the public hearings will be held remotely, accessible to the public by phone and internet. Information on how to attend the hearings will be provided in the agenda as posted on the City's website, www.fortluptonco.gov.

Further information is available through the City Planning and Building Department at (303) 857-6694.

ADDITIONAL INFORMATION AND DOCUMENTS ON THIS APPLICATION CAN BE FOUND AT BIT.LY/FLDEVELOPMENT AND SCROLLING DOWN TO THE ROW TITLED: COYOTE CREEK PRELIMINARY AND FINAL PLAT

ALL INTERESTED PERSONS MAY ATTEND

LEGAL DESCRIPTION

A PORTION OF LAND IN THE CITY OF FORT LUPTON, COLORADO, LOCATED IN THE NORTHEAST QUARTER OF SECTION 5, TOWNSHIP 1 NORTH, RANGE 66 WEST OF THE 6TH PRINCIPAL MERIDIAN, AND MORE PARTICULARLY DESCRIBED AS FOLLOWS:
BASIS OF BEARINGS: THE WEST LINE OF THE NORTHEAST QUARTER OF SECTION 5, TOWNSHIP 1 NORTH, RANGE 66 WEST OF THE 6TH PRINCIPAL MERIDIAN, BEING MONUMENTED AT THE CENTER 1/4 CORNER BY A 3-1/4" ALUMINUM CAP STAMPED "LS 13155" AND AT THE NORTH 1/4 CORNER BY A 3-1/4" ALUMINUM CAP STAMPED "LS 14823" BEARING N00°16'07" A DISTANCE OF 2595.44 FEET AS REFERENCED TO COLORADO STATE PLANE NORTH ZONE. NAD(83).
COMMENCING AT CENTER 1/4 CORNER OF SECTION 5, TOWNSHIP 1 NORTH, RANGE 66 WEST OF THE 6TH PRINCIPAL MERIDIAN;
THENCE ON THE WEST LINE OF THE NORTHEAST QUARTER OF SAID SECTION 5, N00°16'17" A DISTANCE OF 1,111.96 TO THE POINT OF BEGINNING;

THENCE CONTINUING ON SAID WEST LINE, N00°16'07"W A DISTANCE OF 833.49 FEET, TO A POINT ON THE SOUTHERLY LINE OF THAT LIFT STATION SITE RECORDED IN BOOK 1618 AT RECEPTION NO. 2560260, IN THE RECORDS OF THE WELD COUNTY CLERK AND RECORDER;
THENCE ON THE SOUTHERLY AND EASTERLY LINES OF SAID LIFT STATION SITE, THE FOLLOWING TWO (2) COURSES:

1. N89°32'09"E A DISTANCE OF 50.00 FEET;
2. N00°16'07"W A DISTANCE OF 50.00 FEET, TO A POINT ON THE SOUTHERLY LINE OF THE TWOMBLY SCHOOL PROPERTY RECORDED IN BOOK 990 RECEPTION NOS. 1919362-1919366;

THENCE ON SAID SOUTHERLY LINE, N89°32'09"E A DISTANCE OF 961.94 FEET;
THENCE DEPARTING SAID SOUTHERLY LINE, THE FOLLOWING SIX (6) COURSES:

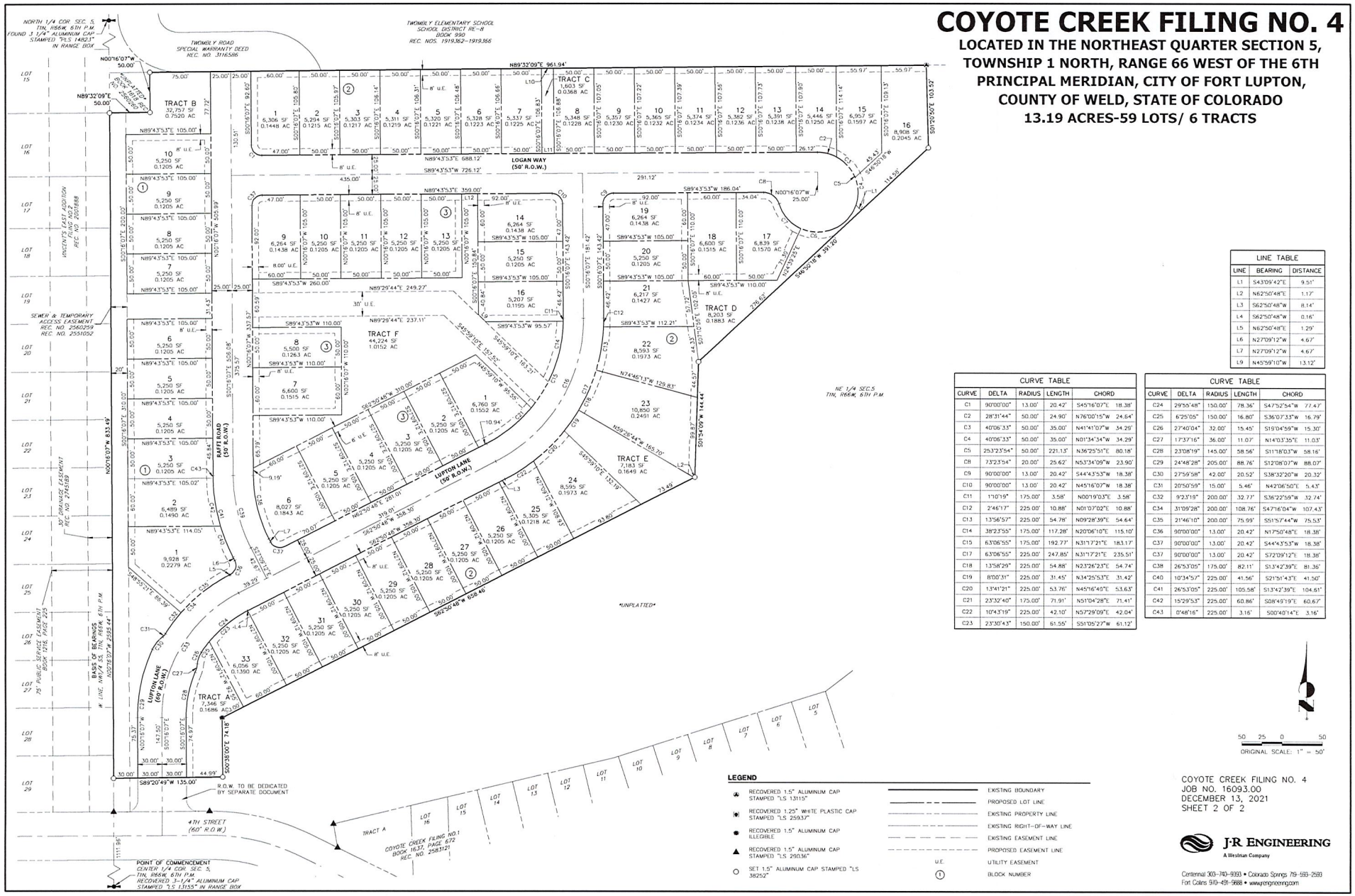
1. S01°20'50"E A DISTANCE OF 103.52 FEET;
2. S46°50'18"W A DISTANCE OF 391.20 FEET;
3. S01°54'09"W A DISTANCE OF 144.44 FEET;
4. S62°50'48"W A DISTANCE OF 658.46 FEET;
5. S00°38'00"E A DISTANCE OF 74.18 FEET;
6. S89°20'49"W A DISTANCE OF 135.00 FEET, TO THE POINT OF BEGINNING.

CONTAINING A CALCULATED AREA OF 574,520 SQUARE FEET OR 13.1892 ACRES.

# COYOTE CREEK FILING NO. 4

**LOCATED IN THE NORTHEAST QUARTER SECTION 5, TOWNSHIP 1 NORTH, RANGE 66 WEST OF THE 6TH PRINCIPAL MERIDIAN, CITY OF FORT LUPTON, COUNTY OF WELD, STATE OF COLORADO**

**13.19 ACRES-59 LOTS/ 6 TRACTS**


NORTH 1/4 COR. SEC. 5, T1N., R66W, 6TH P.M. FOUND 3 1/4" ALUMINUM CAP STAMPED "P.L.S. 14821" IN RANGE BOX
TWOMBLY ROAD SPECIAL WARRANTY DEED REC. NO. 3116586
TWOMBLY ELEMENTARY SCHOOL SCHOOL DISTRICT RE-8 BOOK 990 REC. NOS. 1919362-1919366
N89°32'09"E 961.94'
N89°32'09"E 50.00'
N00°16'07"W 50.00'
TRACT B 32,757 SF 0.7520 AC
TRACT C 1,603 SF 0.0368 AC
LOGAN WAY (50' R.O.W.)
N89°43'53"E 688.12'
S89°43'53"W 726.12'
TRACT D 8,203 SF 0.1883 AC
TRACT E 7,183 SF 0.1649 AC
TRACT F 44,224 SF 1.0152 AC
TRACT A 7,346 SF 0.1686 AC
LUPTON LANE (50' R.O.W.)
KATT ROAD (50' R.O.W.)
4TH STREET (60' R.O.W.)
S89°20'49"W 135.00'
R.O.W. TO BE DEDICATED BY SEPARATE DOCUMENT
POINT OF COMMENCEMENT CENTER 1/4 COR. SEC. 5, T1N., R66W, 6TH P.M. RECOVERED 3-1/4" ALUMINUM CAP STAMPED "LS 13155" IN RANGE BOX
BASIS OF BEARINGS N. LINE, NW1/4 SEC. 5, T1N., R66W, 6TH P.M. N00°16'07"W 2651.44'
SEWER & TEMPORARY ACCESS EASEMENT REC. NO. 2560259 REC. NO. 2551052
30' DRAINAGE EASEMENT REC. NO. 2741858
75' PUBLIC SERVICE EASEMENT BOOK 1215, PAGE 225
VINCENT'S EAST ADDITION FILING NO. 1 REC. NO. 2021868
COYOTE CREEK FILING NO.1 BOOK 1637, PAGE 672 REC. NO. 2583121
NE 1/4 SEC.5 T1N, R66W, 6TH P.M.
*UNPLATTED*
S00°16'07"W 833.49'
S00°16'07"W 1,305.52'
S89°32'09"E 50.00'
S89°20'49"W 2651.44'
S00°35'00"E 74.18'
S45°50'18"W 391.30'
S01°54'09"W 144.44'
S62°50'46"W 358.10'
N62°50'46"E 281.01'
N89°29'44"E 249.27'
N89°29'44"E 237.11'
S45°59'10"E 183.52'
S45°59'10"E 163.21'
N59°28'44"W 165.70'
N74°46'13"W 129.83'
S89°43'53"W 186.04'
S89°43'53"W 260.00'
S89°43'53"W 110.00'
S89°43'53"W 95.57'
S89°43'53"W 112.21'
N89°43'53"E 359.00'
N89°43'53"E 726.12'
N89°43'53"E 105.00'
N89°43'53"E 105.02'
N89°43'53"E 114.05'
S89°43'53"W 105.00'
S89°43'53"W 110.00'
S89°43'53"W 186.04'
S89°43'53"W 105.00'
S89°43'53"W 110.00'
S89°43'53"W 112.21'
S89°43'53"W 95.57'
N89°29'44"E 249.27'
N89°29'44"E 237.11'
S62°50'46"W 358.10'
S62°50'46"W 658.40'
N62°50'46"E 281.01

# CITY OF FORT LUPTON
# CITY COUNCIL

Zo Stieber, Mayor

Valerie Blackston, Ward 1
Chris Ceretto, Ward 2
Carlos Barron, Ward 3

David Crespin, Ward 1
Claud Hanes, Ward 2
Bruce Fitzgerald, Ward 3

**AM 2022-023**

**APPROVE A RESOLUTION ACCEPTING THE COYOTE CREEK PUD FILING NO. 4 FINAL PLAT**

I. Agenda Date: Council Meeting – February 1, 2022

II. Attachments:

a. Proposed Resolution
b. Staff Report
c. Project Description
d. Final Plat
e. Construction Documents
f. Final Drainage Report
g. Traffic Study
h. Geotechnical Report
i. Final Utility Report
j. SWMP Report
k. Xcel Will Serve Letter
l. United Power Will Serve Letter
m. Referral Responses

III. Summary Statement:

The applicants, Rowley Downs Land Company and JR Engineering, have applied for approval of a Final Plat, known as the Coyote Creek PUD Filing No. 4 Final Plat. The proposed Final Plat is for a single-family detached residential subdivision to include 59 lots. The Property that is the subject of the Final Plat is located approximately 200 feet (0.04 miles) east of Beth Avenue and approximately 45 feet (0.01 miles) north of 4th street (the Property).

IV. Submitted by: _____ Planner

V. Finance Reviewed _____ Finance Director

VI. Approved for Presentation: _____ City Administrator

VII. Attorney Reviewed _____ Approved _____ Pending Approval

VIII. Certification of Council Approval: _____ City Clerk _____ Date

## IX. Detail of Issue/Request:

The applicants, Rowley Downs Land Company and JR Engineering, have applied for approval of a Final Plat, known as the Coyote Creek PUD Filing No. 4 Final Plat. The proposed Final Plat is for a single-family detached residential subdivision to include 59 lots. The Property that is the subject of the Final Plat is located approximately 200 feet (0.04 miles) east of Beth Avenue and approximately 45 feet (0.01 miles) north of 4th street (the Property).

The applicant submitted a concurrent request for the Coyote Creek PUD Filing No. 4 Preliminary Plat for this property that was reviewed by City Council at a separate public hearing. The property is currently zoned PUD, with details of the PUD on the Coyote Creek Development Plan from 1996.

## X. Legal/Political Considerations:

This final plat is being reviewed under the final plat provisions of the code in the Subdivision Regulations. Section 17-23 states that a final plat is to be reviewed by City Council, and does not require Planning Commission review. The Code requires that a subdivision improvements agreement be submitted by the applicant for review by the City Attorney and City Council. Completion of the Subdivision Improvements Agreement has been made a condition of approval.

This is the final step in the major subdivision process. The first step is approval of a sketch plat (The Coyote Creek Development Plan from 1996 serves as the sketch and master plan.). The second step is approval of the preliminary plat (reviewed concurrently).

Notifications are not required for a final plat; however, referral agencies were provided with the submittal documents for review. All referral comments received are enclosed with this Action Memorandum.

## XI. Alternatives/Options:

The City Council has the following options for each request:

a) Approve the proposed resolution.
b) Approve the proposed resolution with conditions.
c) Continue the hearing for additional information or further study.
d) Deny the proposed resolution.

## XII. Financial Considerations:

All applicable land use application fees have been paid and a fee deposit has been submitted to cover costs related to the application.

## XIII. Staff Recommendation:

Staff recommends conditional approval of the Coyote Creek PUD Filing No. 4 Final Plat.

**RESOLUTION NO. 2022Rxxx**

**A RESOLUTION OF THE CITY COUNCIL OF FORT LUPTON APPROVING THE FINAL PLAT OF THE COYOTE CREEK PUD FILING NO. 4 FOR A SINGLE-FAMILY DETACHED RESIDENTIAL SUBDIVISION LOCATED IN THE NORTHEAST QUARTER OF SECTION 5, TOWNSHIP 1 NORTH, RANGE 66 WEST OF THE 6TH P.M., COUNTY OF WELD, STATE OF COLORADO.**

**WHEREAS,** Rowley Downs Land Company and JR Engineering ("Applicants") have applied for approval of the Final Plat of the Coyote Creek PUD Filing No. 4 for a single-family detached residential subdivision with open space amenity area; and

**WHEREAS,** the Fort Lupton City Council held a public hearing on February 1, 2022, for the purpose of reviewing the Coyote Creek PUD Filing No. 4 Final Plat; and

**WHEREAS,** after review of the application for a Final Plat, and consideration of staff comments, Applicant's presentation, and any public input, the City Council finds that the Final Plat is in conformance with the Colorado Revised Statutes, City codes and policies, and Comprehensive Plan adopted by the City; and

**NOW THEREFORE BE IT RESOLVED** that the Fort Lupton City Council reviewed the plans and supporting documentation, all referral comments and any citizen input in response to this application. Based upon review of the applicable policies and goals in the Fort Lupton Comprehensive Plan, review of the Subdivision and Zoning Regulations, an analysis of referral comments and facts presented on this date, the City Council hereby recommends approval of the Coyote Creek PUD Filing No. 4 Final Plat located in the Northeast Quarter of Section 5, Township 1 North, Range 66 West of the 6th P.M., City of Fort Lupton, County of Weld, State of Colorado with the following conditions:

I. Prior to recording the Final Plat:

   A. The title of the Final Plat shall be updated to include the Project No. LUP2021-0032 and Plan No. FPL2021-0006.

   B. Any redlines provided by City staff shall be made to the Final Plat maps.

   C. Submit cash-in-lieu or transfer appropriate water shares for the filings being recorded.

   D. Written evidence shall be provided to show that the comments from United Power have been adequately addressed.

   E. Written evidence shall be provided to show that the comments from Xcel Energy (Public Service Company) have been adequately addressed.

   F. Written evidence shall be provided to show that the comments from the Fort Lupton Fire District have been adequately addressed.

   G. Applicant shall work with City staff to finalize the street names within the development.

H. Applicant shall work with the Coyote Creek Golf Course manager to address the Golf Course shed located partially on the Applicant's property.

I. Written evidence shall be provided to show that any comments from the Public Works Director have been adequately addressed.

J. Applicant shall finalize a subdivision improvements agreement for review by City staff and approval by City Council.

K. Applicant shall adequately address any concerns expressed by the Weld RE-8 School District and coordinate the proposed pedestrian access between the development and Twombly Elementary School.

L. The following note shall be added to the Final Plat and Final PUD Plan map:

1. Unless specifically modified by a PUD plan, all provisions of the City's Code and adopted standards and specifications shall apply within PUD Districts.

II. Prior to the start of construction:

A. Applicant shall coordinate with the Coyote Creek Golf Course manager on all construction activities.

B. Applicant shall receive all necessary building permits.

**APPROVED AND PASSED BY A MAJORITY VOTE OF THOSE ELECTED TO THE CITY COUNCIL OF THE CITY OF FORT LUPTON, COLORADO THIS 1st DAY OF FEBRUARY, 2022.**

City of Fort Lupton, Colorado

_____

Zo Stieber, Mayor

Attest:

_____

Maricela Peña, City Clerk

Approved as to form:

_____

Andy Ausmus, City Attorney

CITY OF
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EST 1836
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# COYOTE CREEK PUD FILING NO. 4 FINAL PLAT STAFF REPORT
# LUP2021-0032 & PLAN NO. FPL2021-0006

## PROJECT DESCRIPTION

Project No.: LUP2021-0032 / Plan No.: FPL2021-0006

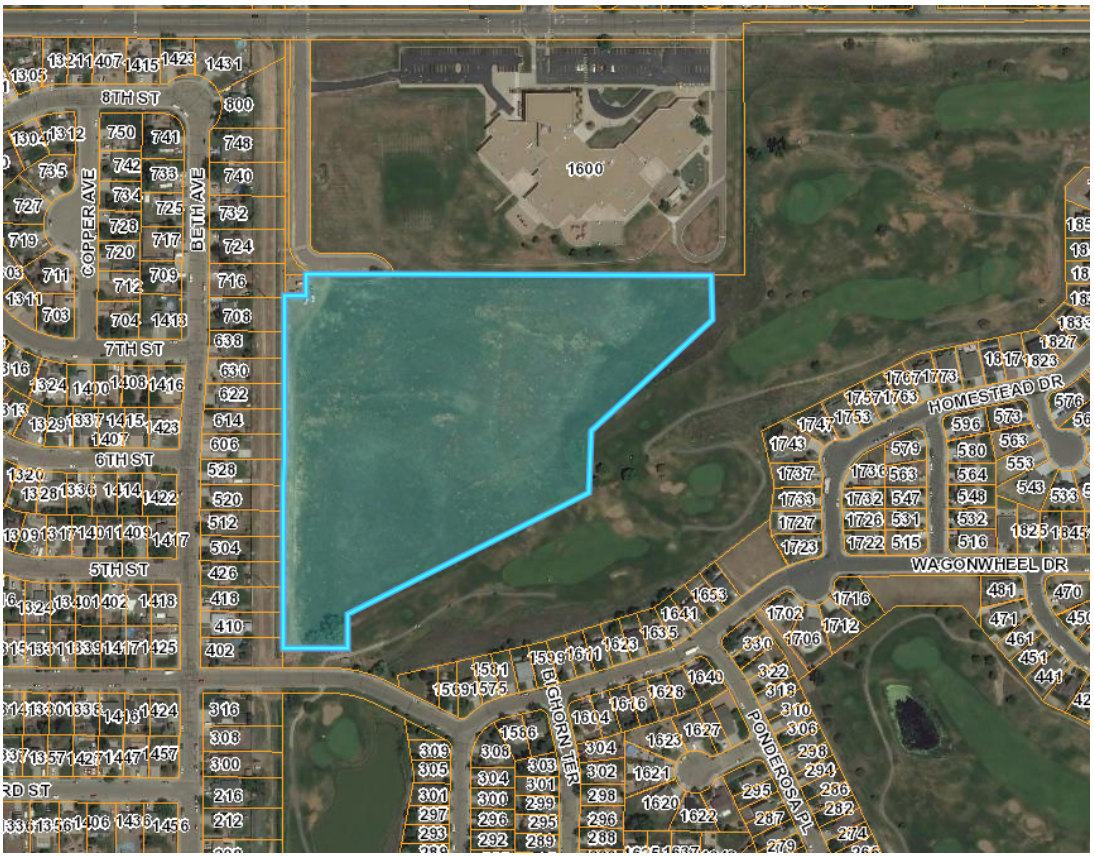
Project Name: Coyote Creek PUD Filing No. 4 Final Plat (submitted for concurrent review with Preliminary Plat)

Owner's Name: James Nicholson with Rowley Downs Land Company

Representative: Kenneth Merritt with JR Engineering

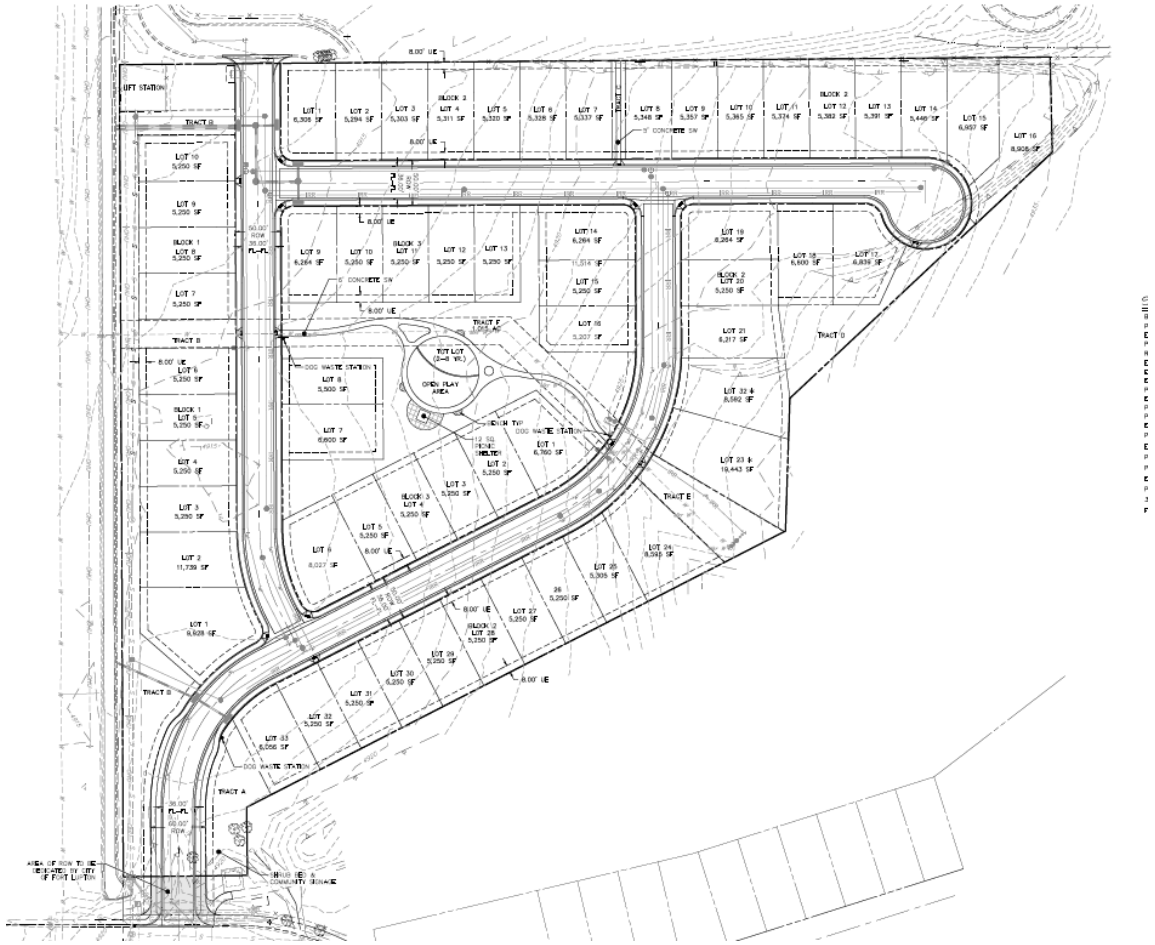
Location of Request:

The site consists of land located approximately 200 feet (0.04 miles) east of Beth Avenue and approximately 45 feet (0.01 miles) north of 4th Street, and is situated directly south of Twombly Elementary School (the "Property"). The Property is located in the Northeast Quarter of Section 5, Township 1 North, Range 66 West of the 6th Principal Meridian, City of Fort Lupton., County of Weld, State of Colorado.



Nature of Request:

The Applicant has submitted a request for a preliminary plat for 59 single family detached residential lots, and will include a central open space area with tot lot.



Site Size: 13.21 acres, more or less.

Zone District: 'PUD' Planned Unit Development.

Proposed Use: Residential uses to include 59 detached single family residential lots, including open space amenity area.

Existing Use: Vacant.

Hearing Dates: City Council – February 1, 2022 at 7:00 PM.

Hearing Location: Fort Lupton City Hall – Council Chambers, 130 S. McKinley Ave., Fort Lupton, Colorado.

Staff Recommendation: Approval with conditions, as shown on the proposed resolution.

**SUMMARY OF PREVIOUS APPLICATIONS**

This property was originally annexed in 1994 with a larger area that was known as the Twombly Annexation. The Coyote Creek Development Plan from 1996 serves as the master PUD plan for this property. This piece is considered the fourth filing of the Coyote Creek development.

The Coyote Creek PUD Filing No. 4 Preliminary Plat was submitted for concurrent review.

**APPLICATION PROCESS**

The Applicant is requesting approval of a final plat for the Coyote Creek PUD Filing No. 4. Final Plat applications are to be processed as set forth in the Code for major subdivisions. The Applicant is applying for concurrent approval of the Preliminary Plat and Final Plat, as permitted under Section 17-22(a)(4) of the Subdivision Regulations.

Section 17-23 states that a final plat is to be reviewed by City Council at a public meeting. A final plat does not require Planning Commission review. The Code requires that a subdivision improvements agreement be submitted by the applicant for review by the City Attorney and City Council. The Applicant is working with the Public Works Director to complete a subdivision improvements agreement.

This is the final step in the major subdivision process. The first step is approval of a sketch plat (The Coyote Creek Development Plan from 1996 serves as the sketch plat and master plan.). The second step is approval of the preliminary plat (reviewed concurrently).

**NOTIFICATION REQUIREMENTS**

Notifications are not required for a final plat; however, referral agencies were provided with the submittal documents for review. All referral comments received are enclosed with this Action Memorandum.

**CONFORMANCE WITH CITY STANDARDS, REGULATIONS AND POLICIES**

The area is zoned PUD Planned Unit Development with residential uses. The objective of a PUD is to provide for the planning and development of substantial tracts of land, suitable in location and character for the uses proposed, as unified and integrated entities in accordance with detailed development plans.

The Preliminary Plat is for a residential subdivision to include 59 single family detached residential lots, a central amenity area. The Applicant has submitted the required documents pursuant to the Code.

The PUD plan was previously approved.

**REFERRALS**

Referrals were provided to the list below. Any comments received are enclosed with the Planning Commission packet.

| | | |
|---|---|---|
| Building Inspector | City Attorney | GIS Specialist |
| Police Chie | Public Works Director | Golf Course Manager |
| Fort Lupton Fire Protection District | CDOT | Colorado Parks and Wildlife |
| Unite Power | Comcast | CenturyLink |

| | | |
|---|---|---|
| Xcel Energy | Postmaster | Weld County School District RE-8 |
| Weld County GIS | NCWCD | |

**STAFF RECOMMENDATION**

Staff recommends conditional approval of the Coyote Creek PUD Filing No. 4 Final Plat Final Plat. Conditions are listed under the proposed Resolution included with the Planning Commission packet.

***For more information on this development, please refer to the Planning Commission packet provided. Additional documents may be available for review at the Fort Lupton City Hall.***

Form PLAN002

CITY OF Fort Lupton EST 1836

Planning & Building

130 S. McKinley Avenue
Fort Lupton, CO 80621
Phone: 303.857.6694
Fax: 303.857.0351
www.fortluptonco.gov

Project No. _____

# Land Use Application Form

## A. CONTACT INFORMATION

1) Property Owner Name: James Nicholson

Company: Rowley Downs Land Company

Phone: 703-317-7080 Email: _____

Address: 260 Krameria Street Denver, CO 80220

Preferred method of contact? Email: ☑ Phone: ☑ Mail: ☐

2) Representative Name: Kenneth Merritt APA, RLA

Company: JR Engineering

Phone: 970-305-6754 Email: kmerritt@jrengineering.com

Address: 2900 South College Ave. Fort COllins, CO 80525

Preferred method of contact? Email: ☑ Phone: ☑ Mail: ☐

3) Billing Contact *(where invoices should be directed to)*: Bob Quinette

Billing Company: Lupton Land, LLC

Phone: 303-587-1966 Email: bob.quinette@gmail.com

Address: 10221 Prestwick Trail Lone Tree , CO 80124

## B. SITE DESCRIPTION

Site Address: TBD

Parcel Number: 147105100053

Existing Zone Classification: PUD Proposed Zone Classification: PUD

Water Type: Municipal Name: _____

Sewage Type: Municipal District Name or Location Hauled to: _____

## C. APPLICATION TYPE (CHECK ALL THAT APPLY)

| | | |
|---|---|---|
| ☐ Sketch Plat | ☐ Administrative Site Plan | ☐ PUD Plan (Preliminary & Final) |
| ☐ Preliminary Plat | ☐ Special Use Permit | ☐ Variance |
| ☑ Final Plat | ☐ Oil & Gas Permit | ☐ Administrative Variance |
| ☐ Minor Subdivision | ☐ Annexation & Initial Zone | ☐ Appeal |
| ☐ Amended Plat | ☐ Change of Zone | ☐ Other: _____ |
| ☐ Site Plan | ☐ Comp Plan Amendment | |

Project No. _____

## D. PROJECT DESCRIPTION

Project Name: Coyote Creek Filing 4

Please provide a short description of the proposed project in the space provided below:

_____

_____

_____

_____

## E. REQUIRED DOCUMENTS

For an application to be considered complete, and for planning staff to begin review and schedule any applicable public hearings, this Land Use Application Form must be fully completed and all required attachments included. Planning staff will review the application for completeness and will provide notice to the representative and/or owner whether the application has been deemed complete.

## F. CERTIFICATIONS

**Representative Certification**

By signing this application, I attest that I am acting with the knowledge and consent of all owners of the property that is the subject of this application, and that I have been designated to act as the representative for the project described in this land use application. I further certify that all information submitted with this application is true and accurate to the best of my knowledge.

Representative: Kim Mutt _____ Date: 12/10/21

**Owner Certification**

I hereby certify that I am the legal owner of record of the property that is the subject of this application. I hereby authorize the representative listed on this application, if any, to communicate directly with City officials and to submit documentation and information regarding this application on my behalf.

Owner: O. Karl Mann _____ Date: 12/10/2021
for Rowley Downs Land Company

---

**For Office Use Only**

Received Date: _____

If the application is not complete, state reasons why it is incomplete:

_____

_____

_____

Deemed Complete Date: _____

Fees Submitted: _____ Escrow Submitted: _____

## Instructions for Submitting the Land Use Application Form

**DEFINITIONS**

Words in the singular include the plural and words in the plural include the singular.

*Application* refers to the official submittal to the City of Fort Lupton's Planning Department for review of the proposed land use development identified in the land use application form. The application includes the form, all materials submitted for review of the project, including those documents required under the Land Use Regulations of the Municipal Code, and any additional information provided.

*Project* refers to the land use development identified on the land use application form and application materials.

*Property* refers to the land that is being proposed for development as described in the land use application form and application materials.

**A. CONTACT INFORMATION**

1) Provide contact information for all owners of any property that is the subject of the application. If the contact information for all property owners will not fit on the space provided, submit a separate sheet for the additional owners.
2) Provide contact information for all persons, firms or businesses that are authorized by the owners identified in Section A(1) to work on the land use application, including, but not limited to, discussing the project, submitting application materials, and attending meeting and hearings. If the contact information for all representatives will not fit on the space provided, submit a separate sheet for the additional representatives.
3) Provide contact and mailing information for the person that should receive all invoices for the project. If this person changes at any time, contact the Planning Department immediately to update this information.

**B. SITE DESCRIPTION**

Provide all information requested. Parcel numbers and address information may be found at the Weld County Property Portal at https://www.co.weld.co.us/maps1/propertyportal/. Current zoning can be found at http://www.fortlupton.org/405/Zoning.

**C. APPLICATION TYPE**

Select the land use application that is applicable to the project. If there are multiple land use application types being submitted to run concurrently, select all that apply. The land use application types will be identified during the required pre-application meeting. If you have any questions about this, please contact the Planning Department at 303.857.6694 or planningdept@fortlupton.org.

**D. PROJECT DESCRIPTION**

Please select a project name that will be referenced throughout the project and a description of what the project entails. If you need more space for the project description, please attach a separate sheet.

**E. REQUIRED DOCUMENTS**

Required documents will be discussed during the pre-application meeting with the Planning Department. If any documents are missing, the acceptance of the application may be delayed until the submittal is complete.

**F. CERTIFICATIONS**

**Representative Certification.** Provide the signature of all authorized representatives in this section.
**Owner Certification.** Provide the signature of all owners of properties included in the application in this section.

**For any other questions, please contact the Planning Department at 303.857.6694 or planningdept@fortlupton.org.**

## Coyote Creek Filing No. 4 - Development Narrative

Coyote Creek Filing 4 is generally located in the northwest corner of the approved Coyote Creek PUD Master Development Plan and is designated as Parcel A being approximately 13 acres in size. Parcel A is currently identified on the approved PUD Master Development Plan as Multi-Family and allows for up to 193 Multi-Family Dwelling Units with an allowed Density of 14.9 Dwelling Unit per Acre. Coyote Creek Filing 4 is proposing to modify the current approved Land Use from Multi-Family to Single Family Detached Residential which if approved would allowing for 59 Single Family Detached Residential Lots on 13.35 Acres with a Gross Density of 4.42 Dwelling Units per Acres.

Also included as part of Coyote Creek Filing 4 Development is 2.84 Acres of Public Street Right-of-Way Dedication (21.3% of Total Site Area), 1.47 Acres of Common Open Space (11.0% of Total Site Area) to be owned and maintained by the Coyote Creek Filing 4 Home Owners Association (HOA) and 1.01 Acres of Park Public Land Dedication (7.7% of Total Site Area) to also be owned and maintained by the Coyote Creek Filing 4 (HOA). When approved by the City the Developers of Coyote Creek Filing 4 when will also be responsible to construct all necessary Public Roads, Water, Sanitary Sewer, Storm Sewer and Gray Water Irrigation infrastructure needed to support the proposed Single Family Residential Development.

# COYOTE CREEK FILING NO. 4

## LOCATED IN THE NORTHEAST QUARTER SECTION 5, TOWNSHIP 1 NORTH, RANGE 66 WEST OF THE 6TH PRINCIPAL MERIDIAN, CITY OF FORT LUPTON, COUNTY OF WELD, STATE OF COLORADO

## 13.19 ACRES-59 LOTS/ 6 TRACTS

### DESCRIPTION:

A PORTION OF LAND IN THE CITY OF FORT LUPTON, COLORADO, LOCATED IN THE NORTHEAST QUARTER OF SECTION 5, TOWNSHIP 1 NORTH, RANGE 66 WEST OF THE 6TH PRINCIPAL MERIDIAN, AND MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BASIS OF BEARINGS: THE WEST LINE OF THE NORTHEAST QUARTER OF SECTION 5, TOWNSHIP 1 NORTH, RANGE 66 WEST OF THE 6TH PRINCIPAL MERIDIAN, BEING MONUMENTED AT THE CENTER 1/4 CORNER BY A 3-1/4" ALUMINUM CAP STAMPED "LS 13155" AND AT THE NORTH 1/4 CORNER BY A 3-1/4" ALUMINUM CAP STAMPED "LS 14823" BEARING N00°16'07" A DISTANCE OF 2595.44 FEET AS REFERENCED TO COLORADO STATE PLANE NORTH ZONE. NAD(83).

COMMENCING AT CENTER 1/4 CORNER OF SECTION 5, TOWNSHIP 1 NORTH, RANGE 66 WEST OF THE 6TH PRINCIPAL MERIDIAN;

THENCE ON THE WEST LINE OF THE NORTHEAST QUARTER OF SAID SECTION 5, N00°16'17" A DISTANCE OF 1,111.96 TO THE POINT OF BEGINNING;

THENCE CONTINUING ON SAID WEST LINE, N00°16'07"W A DISTANCE OF 833.49 FEET, TO A POINT ON THE SOUTHERLY LINE OF THAT LIFT STATION SITE RECORDED IN BOOK 1618 AT RECEPTION NO. 2560260, IN THE RECORDS OF THE WELD COUNTY CLERK AND RECORDER;

THENCE ON THE SOUTHERLY AND EASTERLY LINES OF SAID LIFT STATION SITE, THE FOLLOWING TWO (2) COURSES:

1. N89°32'09"E A DISTANCE OF 50.00 FEET;
2. N00°16'07"W A DISTANCE OF 50.00 FEET, TO A POINT ON THE SOUTHERLY LINE OF THE TWOMBLY SCHOOL PROPERTY RECORDED IN BOOK 990 RECEPTION NOS. 1919362-1919366;

THENCE ON SAID SOUTHERLY LINE, N89°32'09"E A DISTANCE OF 961.94 FEET;

THENCE DEPARTING SAID SOUTHERLY LINE, THE FOLLOWING SIX (6) COURSES:

1. S01°20'50"E A DISTANCE OF 103.52 FEET;
2. S46°50'18"W A DISTANCE OF 391.20 FEET;
3. S01°54'09"W A DISTANCE OF 144.44 FEET;
4. S62°50'48"W A DISTANCE OF 658.46 FEET;
5. S00°38'00"E A DISTANCE OF 74.18 FEET;
6. S89°20'49"W A DISTANCE OF 135.00 FEET, TO THE POINT OF BEGINNING.

CONTAINING A CALCULATED AREA OF 574,520 SQUARE FEET OR 13.1892 ACRES.

### DEDICATION:

KNOW ALL MEN BY THESE PRESENTS, THAT I/WE _____, BEING THE SOLE OWNER(S) OF THE LAND DESCRIBED HEREIN, HAVE CAUSED SAID LAND TO BE LAID OUT AND PLATTED UNDER THE NAME OF COYOTE CREEK FILING NO.4, AND DO HEREBY DEDICATE TO THE CITY OF FORT LUPTON AND ITS LICENSEES FOR PUBLIC USE FOREVER ALL STREETS, ALLEYS AND UTILITY EASEMENTS AS INDICATED HEREON. IN COMPLIANCE WITH THE CITY OF FORT LUPTON SUBDIVISION REGULATIONS AND BY CONTRACTUAL AGREEMENT, THE LANDOWNER(S) SHALL BEAR ALL EXPENSES INVOLVED IN IMPROVEMENTS.

IN WITNESS WHEREOF, WE HAVE HEREUNTO SET OUR HANDS AND SEALS THIS ___ DAY OF _____, 20__.

_____

ACKNOWLEDGMENT

STATE OF COLORADO )
) SS
COUNTY OF WELD )
THE FOREGOING INSTRUMENT WAS ACKNOWLEDGED BEFORE ME THIS ___ DAY OF _____, 20_____
WITNESS MY HAND AND OFFICIAL SEAL.

MY COMMISSION EXPIRES_____

_____
NOTARY PUBLIC

### OWNERS APPROVAL:

KNOW ALL MEN BY THESE PRESENTS, THAT I/WE _____, BEING THE SOLE OWNER(S) OF THE LAND DESCRIBED HEREIN, AND _____ ARE ALL OF THE MORTGAGEES AND HOLDERS OF LIENS UPON THE PROPERTY, AND EACH AND ALL HEREBY CONSENT TO THIS PLAT AND JOIN THE CONVEYANCE AND DEDICATION OF ALL STREETS, ROADS, ALLEYS, EASEMENTS, PUBLIC WAYS AND PLACES SHOWN HEREON.

IN WITNESS WHEREOF, WE HAVE HEREUNTO SET OUR HANDS AND SEALS THIS ___ DAY OF _____, 201_.

_____

ACKNOWLEDGMENT

STATE OF COLORADO )
) SS
COUNTY OF WELD )
THE FOREGOING INSTRUMENT WAS ACKNOWLEDGED BEFORE ME THIS ___ DAY OF _____, 20_____ BY
WITNESS MY HAND AND OFFICIAL SEAL.

MY COMMISSION EXPIRES_____

_____
NOTARY PUBLIC

OWNER:

LUPTON LAND, LLC
10221 PRESTWICK TRAIL
LONE TREE, CO 80124
ATTN: BOB QUINETTE

SURVEYOR/CIVIL ENGINEER/LANDSCAPE ARCHITECT

JR ENGINEERING
2900 SOUTH COLLEGE AVENUE, SUITE 3D
FORT COLLINS, CO 80525
ATTN: KEN MERRITT

**VICINITY MAP** SCALE: 1"=1000'

LAND SUMMARY CHART

| TYPE | AREA (SF) | AREA (AC) | % OF TOTAL AREA |
|---|---|---|---|
| RESIDENTIAL LOTS | 349,335 | 7.9063 | 60.80% |
| TRACTS | 101,316 | 2.3259 | 17.63% |
| PUBLIC ROW | 123,870 | 2.8437 | 21.56% |
| TOTAL | 574,521 | 13.0759 | 100.00% |

TRACT SUMMARY CHART

| TRACT | AREA (SF) | AREA (ACRES) | USE | OWNERSHIP | MAINTENANCE |
|---|---|---|---|---|---|
| Tract A | 7,346 | 0.1686 | | DEVELOPER/HOA | DEVELOPER/HOA |
| Tract B | 32,757 | 0.7520 | | | |
| Tract C | 1,603 | 0.0368 | | | |
| Tract D | 8,203 | 0.1883 | | | |
| Tract E | 7,183 | 0.1649 | | | |
| Tract F | 44,224 | 1.0152 | | | |
| Total Area | 101,316 | 2.3259 | | | |

### GENERAL NOTES:

1. NOTICE: PER C.R.S. 13-80-105, YOU MUST COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY WITHIN THREE YEARS AFTER YOU FIRST DISCOVER SUCH DEFECT. IN NO EVENT MAY ANY ACTION BASED UPON ANY DEFECT IN THIS SURVEY BE COMMENCED MORE THAN TEN YEARS FROM THE DATE OF THE CERTIFICATION SHOWN HEREON.
2. PER C.R.S. 38-51-106, "ALL LINEAL UNITS DEPICTED ON THIS LAND SURVEY PLAT ARE U.S. SURVEY FEET. ONE METER EQUALS 39.37/12 U.S. SURVEY FEET, EXACTLY ACCORDING TO THE NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY."
3. PER THE BYLAWS AND RULES OF THE STATE BOARD OF LICENSURE FOR ARCHITECTS, PROFESSIONAL ENGINEERS AND PROFESSIONAL LAND SURVEYORS, CERTIFICATION IS DEFINED AS A STATEMENT THAT INCLUDES THE FOLLOWING: (A) IS SIGNED AND/OR SEALED BY A PROFESSIONAL LAND SURVEYOR REPRESENTING THAT THE SURVEYING SERVICES ADDRESSED THEREIN HAVE BEEN PERFORMED BY THE PROFESSIONAL LAND SURVEYOR OR UNDER THE PROFESSIONAL LAND SURVEYOR IN RESPONSIBLE. (B) IS BASED UPON THE PROFESSIONAL LAND SURVEYOR'S KNOWLEDGE, INFORMATION AND BELIEF. (C) IS IN ACCORDANCE WITH APPLICABLE STANDARDS OF PRACTICE. (D) IS NOT A GUARANTY OR WARRANTY, EITHER EXPRESSED OR IMPLIED.
4. THIS SURVEY DOES NOT CONSTITUTE A TITLE SEARCH BY JR ENGINEERING, LLC. FOR ALL INFORMATION REGARDING EASEMENTS, RIGHT-OF-WAY OR TITLE OF RECORD, JR ENGINEERING, LLC RELIED UPON TITLE COMMITMENT NO. NCS-1061102-CO, PREPARED BY FIRST AMERICAN TITLE INSURANCE COMPANY, DATED APRIL 13, 2021 AT 5:00 P.M.
5. LAND DESCRIBED IN THIS PLAT IN NOT IN A F.E.M.A. FLOODPLAIN AS PER FLOOD INSURANCE RATE MAP PANEL NUMBER 08123C2110E WITH A REVISION DATE OF JANUARY 20, 2016.
6. A PUBLIC UTILITY EASEMENT IS HEREBY GRANTED OVER ALL OF TRACTS B & E.

### SURVEYORS CERTIFICATE:

I, JARROD ADAMS, A DULY REGISTERED PROFESSIONAL LAND SURVEYOR IN THE STATE OF COLORADO, DO HEREBY CERTIFY THAT THIS PLAT OF COYOTE CREEK FILING NO. 4 WAS PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION, AND THIS PLAT HAS BEEN PREPARED IN COMPLIANCE WITH ALL APPLICABLE LAWS OF THE STATE OF COLORADO AT THE TIME OF THIS SURVEY WITHIN MY CONTROL, AND IS ACCURATE TO THE BEST OF MY KNOWLEDGE, INFORMATION AND BELIEF

COLORADO L.S. JARROD ADAMS 38252 PROFESSIONAL LAND SURVEYOR

_____
JARROD ADAMS, COLORADO PLS NO. 38252
FOR AND ON BEHALF OF JR ENGINEERING, LLC

### MAYOR'S CERTIFICATE:

THIS IS TO CERTIFY THAT A PLAT OF THE ABOVE-DESCRIBED PROPERTY WAS APPROVED BY [ORDINANCE/RESOLUTION NO._____ OF THE CITY OF FORT LUPTON PASSED AND ADOPTED ON THE ___DAY OF _____, A.D., 20__ AND THAT THE MAYOR OF THE CITY OF FORT LUPTON, AS AUTHORIZED BY SAID[ORDINANCE/RESOLUTION] ON BEHALF OF THE CITY OF FORT LUPTON, HEREBY ACKNOWLEDGES AND ADOPTS THE SAID PLAT UPON WHICH THIS CERTIFICATE IS ENDORSED FOR ALL PURPOSES INDICATED THEREON.

_____
MAYOR

ATTEST _____
TOWN CLERK

### CITY ENGINEER'S APPROVAL:

APPROVED ON THIS_____ DAY OF _____, 20_____.

_____
CITY ENGINEER

### PLANNING COMMISSION RECOMMENDATION:

RECOMMENDED THIS_____ DAY OF _____, 20_____BY RESOLUTION NO._____

_____
CHAIRPERSON, FORT LUPTON PLANNING COMMISSION

### CITY ADMINISTRATOR'S APPROVAL:

APPROVED ON THIS_____ DAY OF _____, 20_____.

_____
CITY ADMINISTRATOR

### CITY WATER AND SEWER DEPARTMENT APPROVAL:

APPROVED ON THIS_____ DAY OF _____, 20_____.

_____
DIRECTOR OF PUBLIC WORKS

### TITLE VERIFICATION CERTIFICATION:

WE, _____, DO HEREBY CERTIFY THAT WE HAVE EXAMINED THE TITLE OF ALL LAND PLATTED HEREON AND THAT TITLE TO SUCH LAND IS IN THE DEDICATOR(S), IS FREE AND CLEAR OF ALL MONETARY LIENS AND MONETARY ENCUMBRANCES AND IS OTHERWISE SUBJECT ONLY TO THOSE ITEMS OF RECORD SHOWN IN SCHEDULE B-2 OF TITLE COMMITMENT ORDER NUMBER _____ WITH AN EFFECTIVE DATE OF _____.

_____ _____
BY: DATE
AS:

ACKNOWLEDGMENT
STATE OF COLORADO )
) ss.
COUNTY OF WELD )
ACKNOWLEDGED BEFORE ME THIS _____ DAY OF _____, 20_____ BY _____ AS _____.
WITNESS MY HAND AND OFFICIAL SEAL

_____
NOTARY PUBLIC
MY COMMISSION EXPIRES: _____

### ACCEPTANCE CERTIFICATE:

THE DEDICATION OF TRACTS _____ ARE HEREBY ACCEPTED FOR OWNERSHIP AND MAINTENANCE BY THE _____.

BY: _____ DATE: _____

TITLE: _____
AUTHORIZED SIGNER

ACKNOWLEDGMENT
STATE OF COLORADO )
) ss.
COUNTY OF _____)
ACKNOWLEDGED BEFORE ME THIS _____ DAY OF _____, 20_____ BY _____ AS _____.
WITNESS MY HAND AND OFFICIAL SEAL

_____
NOTARY PUBLIC
MY COMMISSION EXPIRES: _____

### CLERK AND RECORDER'S CERTIFICATE:

THIS PLAT IS ACCEPTED FOR FILING IN THE OFFICE OF THE CLERK AND RECORDER OF WELD COUNTY, COLORADO,

AT _____O'CLOCK __.M., ON THE _____ DAY OF _____, 20___,

AS RECEPTION NO. _____

_____
CLERK AND RECORDER

_____
BY: DEPUTY

COYOTE CREEK FILING NO. 4
JOB NO. 16093.00
DECEMBER 13, 2021
SHEET 1 OF 2

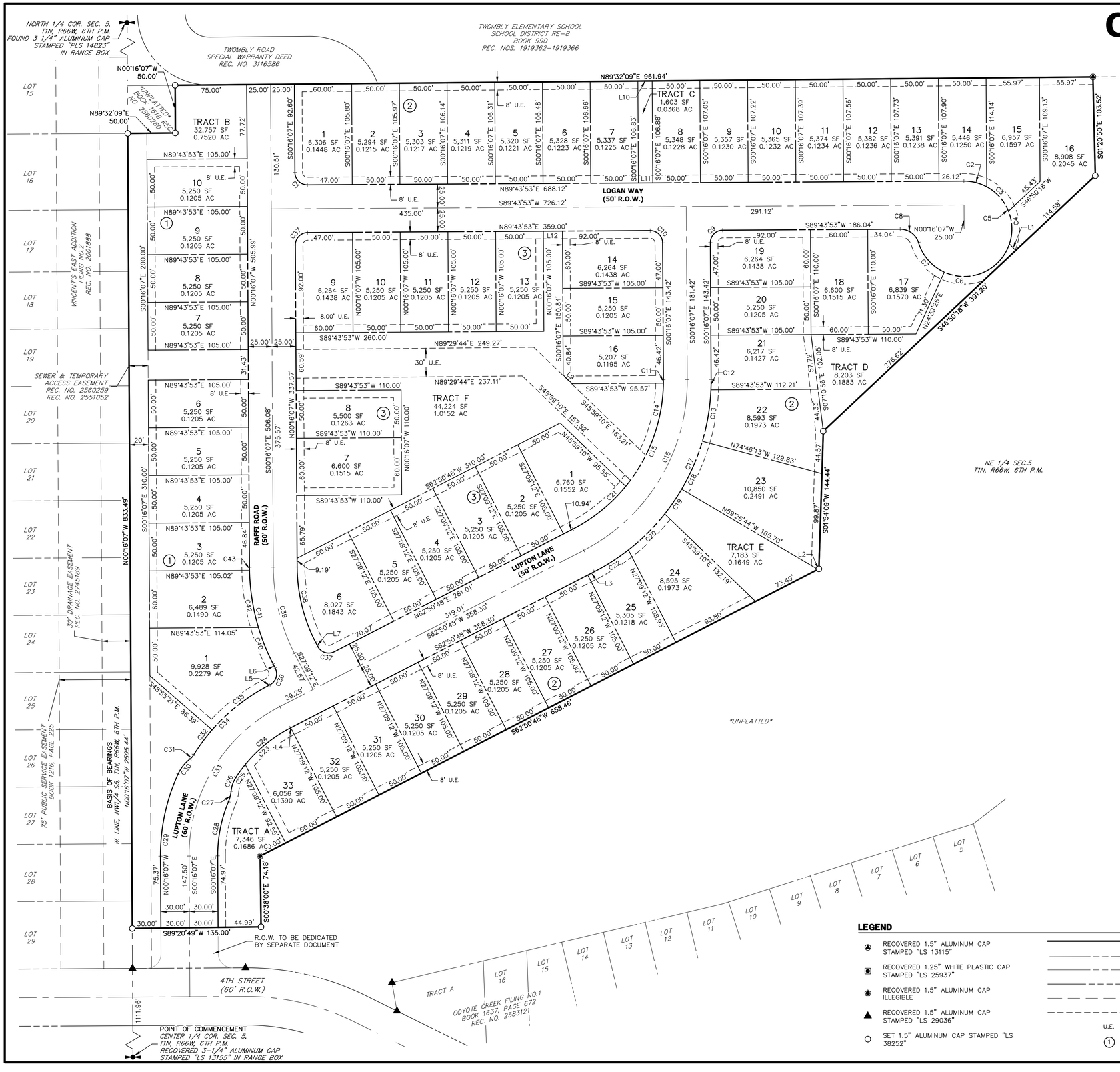
J·R ENGINEERING
A Westrian Company

Centennial 303-740-9393 • Colorado Springs 719-593-2593
Fort Collins 970-491-9888 • www.jrengineering.com

# COYOTE CREEK FILING NO. 4

## LOCATED IN THE NORTHEAST QUARTER SECTION 5, TOWNSHIP 1 NORTH, RANGE 66 WEST OF THE 6TH PRINCIPAL MERIDIAN, CITY OF FORT LUPTON, COUNTY OF WELD, STATE OF COLORADO

## 13.19 ACRES-59 LOTS/ 6 TRACTS


NORTH 1/4 COR. SEC. 5, T1N, R66W, 6TH P.M. FOUND 3 1/4" ALUMINUM CAP STAMPED "PLS 14823" IN RANGE BOX
TWOMBLY ROAD SPECIAL WARRANTY DEED REC. NO. 3116586
TWOMBLY ELEMENTARY SCHOOL SCHOOL DISTRICT RE-8 BOOK 990 REC. NOS. 1919362-1919366
UNPLATTED BOOK 1612 REC. NO. 2560280
N00°16'07"W 50.00'
N89°32'09"E 50.00'
N89°32'09"E 961.94'
TRACT B 32,757 SF 0.7520 AC
TRACT C 1,603 SF 0.0368 AC
LOGAN WAY (50' R.O.W.)
S01°20'50"E 103.52'
S89°43'53"W 726.12'
N89°43'53"E 688.12'
S89°43'53"W 186.04'
N89°43'53"E 359.00'
S89°43'53"W 260.00'
N89°29'44"E 249.27'
N89°29'44"E 237.11'
S89°43'53"W 110.00'
S89°43'53"W 95.57'
S89°43'53"W 112.21'
S89°43'53"W 110.00'
TRACT D 8,203 SF 0.1883 AC
TRACT E 7,183 SF 0.1649 AC
TRACT F 44,224 SF 1.0152 AC
TRACT A 7,346 SF 0.1686 AC
S46°50'18"W 391.20'
S45°59'10"E 157.32'
S45°59'10"E 163.21'
S62°50'48"W 310.00'
S62°50'48"W 281.01'
S62°50'48"W 358.30'
S62°50'48"W 658.46'
N74°46'13"W 129.83'
N59°26'44"W 165.70'
S45°39'10"E 132.19'
S01°54'09"W 144.44'
S01°54'09"W 99.87'
S89°20'49"W 135.00'
S00°38'00"E 74.18'
N00°16'07"W 833.49'
S00°16'07"E 506.08'
N00°16'07"W 505.99'
S00°16'07"E 200.00'
S00°16'07"E 310.00'
N00°16'07"W 337.57'
S00°16'07"E 181.42'
S00°16'07"E 143.42'
S00°16'07"E 110.00'
S00°16'07"E 102.05'
N00°16'07"W 150.84'
S00°16'07"E 143.42'
N00°16'07"W 110.00'
S00°16'07"E 130.51'
N00°16'07"W 25.00'
N00°16'07"W 110.00'
S00°16'07"E 92.60'
S00°16'07"E 105.80'
S00°16'07"E 105.97'
S00°16'07"E 106.14'
S00°16'07"E 106.31'
S00°16'07"E 106.48'
S00°16'07"E 106.66'
S00°16'07"E 106.83'
S00°16'07"E 106.88'
S00°16'07"E 107.05'
S00°16'07"E 107.22'
S00°16'07"E 107.39'
S00°16'07"E 107.56'
S00°16'07"E 107.73'
S00°16'07"E 107.90'
S00°16'07"E 114.14'
S00°16'07"E 109.13'
S00°16'07"E 106.83'
S00°16'07"E 106.66'
S00°16'07"E 106.48'
S00°16'07"E 106.31'
S00°16'07"E 106.14'
S00°16'07"E 105.97'
S00°16'07"E 105.80'
S00°16'07"E 92.60'
N89°43'53"E 105.00'
N89°43'53"E 105.02'
N89°43'53"E 114.05'
S48°55'21"E 86.39'
S27°09'12"E 42.67'
S27°09'12"E 105.00'
N27°09'12"W 105.00'
N27°09'12"W 108.93'
N27°09'12"W 97.55'
N27°09'12"W 105.00'
N27°09'12"W 105.00'
N27°09'12"W 105.00

# COYOTE CREEK FILING NO. 4

## COYOTE CREEK PA-4 LOCATED IN
## NE QUARTER OF SECTION 5, TOWNSHIP 1 NORTH, RANGE 66 WEST OF 6TH P.M., FORT LUPTON, COUNTY OF WELD, STATE OF COLORADO

# CONSTRUCTION PLANS

## KEY CONTACTS


OWNER:

LUPTON LAND, LLC (303) 587–1966
10221 PRESTWICK TRAIL
LONE TREE, CO 80124
ATTN: BOB QUINETTE

PLANNER/CIVIL ENGINEER/LANDSCAPE ARCHITECT

JR ENGINEERING (970) 305–6754
2900 SOUTH COLLEGE AVENUE, SUITE 3D
FORT COLLINS, CO 80525
ATTN: KEN MERRITT

CITY

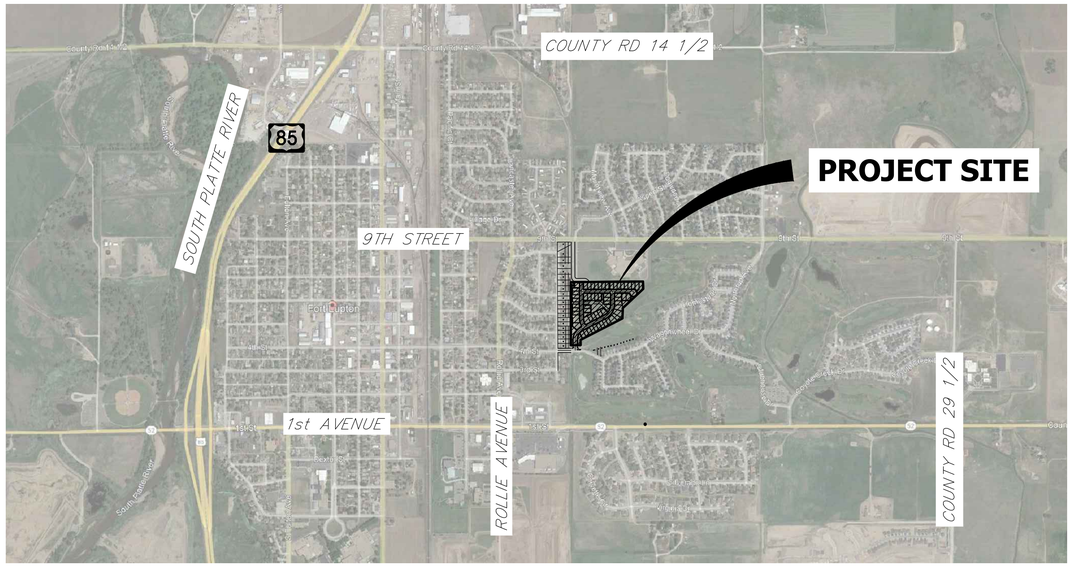
CITY OF FORT LUPTON, ENGINEERING (720) 466–6106
130 SOUTH McKINLEY AVENUE
FORT LUPTON, CO 80621
ATTN: TODD HODGES


## BENCHMARK:

WELD COUNTY BENCHMARK 4907, 3–3/4" PIPE CAP ON PIPE APPROXIMATELY 90 FEET WEST OF THE WESTERLY MOST RAILROAD TRACK AND 26 FEET SOUTH OF THE CENTERLINE OF 9TH STREET, ELEVATION=4908.22 (NAVD88)

## BASIS OF BEARING:

THE WEST LINE OF THE NORTHEAST QUARTER OF SECTION 5, TOWNSHIP 1 NORTH, RANGE 66 WEST OF THE 6TH PRINCIPAL MERIDIAN, BEING MONUMENTED AT THE NORTH END BY A 3–1/4" ALUMINUM CAP STAMPED "1/4 2003 PLS 14823" IN A RANGE BOX AND AT THE SOUTH END BY A #6 REBAR WITH 3–1/4" ALUMINUM CAP STAMP ILLEGIBLE OFF TO THE SIDE IN A RANGE BOX, BEARING N00°16'07"W AS REFERENCED TO COLORADO STATE PLANE NORTH ZONE.




PROJECT LOCATION MAP
SCALE: 1" = 1000'

## SHEET INDEX


| | | |
|---|---|---|
| 1 | – | COVER SHEET |
| 2 | – | GENERAL NOTES |
| 3 | – | OVERALL LEGEND |
| 4 | – | PUD FINAL PLAT |
| 5 | – | FINAL SITE PLAN |
| 6 | – | FINAL GRADING & EROSION CONTROL PLAN |
| 7–9 | – | FINAL STREET PLAN AND PROFILE |
| 10 | – | FINAL UTILITY PLAN |
| 11–13 | – | WATER PLAN & PROFILE |
| 14–16 | – | SANITARY SEWER PLAN & PROFILE |
| 17 | – | SERVICE PLAN |
| 18 | – | FINAL DRAINAGE PLAN |
| 19–21 | – | STORM SEWER PLAN & PROFILE |
| 22 | – | SIGNAGE PLAN |
| 23–24 | – | LANDSCAPE PLAN |
| 25–29 | – | DETAILS |
| 30–46 | – | PRODUCT ELEVATIONS & PLANS |


## LAND SUMMARY CHART

EXISTING ZONING – PUD MULTI–FAMILY:193 DWELLING UNITS, 14.9 DU'S/AC

PROPOSED ZONING – PUD SINGLE FAMILY DETACHED RESIDENTIAL

TOTAL SITE AREA – 13.351AC

NUMBER OF LOTS – 59 LOTS

GROSS DENSITY – 4.42 DU'S/AC

MINIMUM LOT SIZE – 5,206 SF

MAXIMUM LOT SIZE – 9,928 SF

AVERAGE LOT SIZE – 5,921 SF

| | | | |
|---|---|---|---|
| SINGLE FAMILY LOT AREA | 349,334SF | 8.0196AC | 60.0% OF SITE AREA |
| OPEN SPACE (TRACTS A–E) | 64,155SF | 1.4728AC | 11.0% OF SITE AREA |
| PARK SPACE (TRACT F) PUBLIC LAND DEDICATION | 44,213SF | 1.015AC | 7.70% OF SITE AREA |
| PUBLIC ROW | 123,866SF | 2.8436AC | 21.3% OF SITE AREA |
| TOTAL | 581,568SF | 13.351AC | 100% OF SITE AREA |

## SETBACK REQUIREMENTS

| | |
|---|---|
| FRONT SETBACK | 20' HOUSE / GARAGE |
| REAR YARD SETBACK | 20' |
| SIDE ACCESS SETBACK | 5' |
| CORNER SIDE YARD SETBACK AT ROW | 15' |

## PLAT NOTES

PRIOR TO FURTHER DEVELOPMENT OF COMMERCIAL BLOCKS/LOTS OR DEVELOPMENT OF RESIDENTIAL BLOCKS, A PRE–APPLICATION MEETING WILL BE REQUIRED TO DETERMINE THE APPROPRIATE LAND USE PROCESS. ANY FURTHER DIVISION OF BLOCKS MAY REQUIRE PRELIMINARY PLAT AND FINAL PLAT PROCESSES.

## DESIGN STANDARDS

NO HOME MODEL ELEVATION SHALL BE REPEATED MORE THAN ONCE EVERY THIRD (3RD) LOTS ON THE SAME SIDE OF THE STREET (E.G. THE FIRST AND FOURTH LOTS IN A ROW MAY CONTAIN THE SAME MODEL ELEVATION, BUT THE SECOND AND THIRD LOT MUST CONTAIN TWO (2) DIFFERENT MODEL ELEVATIONS.

ALL STREET FACING GARAGE DOORS ON GARAGES ATTACHED TO PRINCIPAL DWELLING STRUCTURES SHALL HAVE THE ABILITY TO BE PROUD OF THE FRONT FACADE OF THE DWELLING PORTION OF THE STRUCTURE AND/OR FRONT PORCH.

GARAGE DOORS SHALL NOT COMPRISE MORE THAN FORTY–SEVEN (47) PERCENT OF THE FRONT FACADE OF THE PRINCIPAL DWELLING STRUCTURE FOR TWO–CAR GARAGES NOR MORE THAN FIFTY–FIVE (55) PERCENT FOR THREE–CAR GARAGES.

ALL HOMES WILL INCORPORATE A SINGLE EARTH–TONED ASPHALT SHINGLE COLOR THAT WILL HARMONIZE WITH ALL EXTERIOR COLOR PALETTES WITHIN THE SUBDIVISION.

## FENCING STANDARDS

FENCES SHALL BE CONSTRUCTED PER THE FORT LUPTON MUNICIPAL CODE, EXCEPT THAT CHAIN LINK/WOVEN WIRE FENCES ARE NOT AN ALLOWED MATERIAL. (SEE DETAIL SHEET 11)

## UTILITY MAINTENANCE STATEMENT

ALL PUBLIC WATER , STORM SEWER AND SANITARY SEWER MAINS AND APPURTENANCES LOCATED IN PUBLIC ROW SHALL BE MAINTAINED BY THE CITY OF FORT LUPTON PUBLIC WORKS DEPARTMENT. ALL PUBLIC WATER , STORM SEWER, SANITARY SEWER MAINS AND APPURTENANCE S UNDER PRIVATE DRIVES ARE LOCATED IN UTILITY EASEMENTS. CITY IS RESPONSIBLE FOR MAINTENANCE OF THESE WATER,STORM AND SANITARY SEWER FACILITIES. CITY IS NOT RESPONSIBLE FOR REPAIR OR REPLACEMENT OF PRIVATE DRIVE, CURB AND GUTTER OR LANDSCAPING DAMAGED DURING UTILITY REPAIR OR MAINTENANCE.

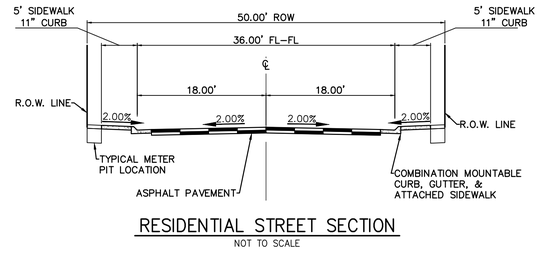
## P.U.D. LAND USE STANDARDS

SINGLE–FAMILY USES AND DENSITIES MAY BE ALLOWED ON PROPERTIES DESIGNATED MULTI–FAMILY.

SINGLE–FAMILY USES ON STANDARD LOTS. INCLUDING THE NECESSARY APPURTENANT AND ACCESSORY FACILITIES AND USES ASSOCIATED WITH SUCH LIVING AREAS. NO BUILDING OR LAND SHALL BE USED AND NO BUILDING SHALL BE HEREAFTER ERECTED OR STRUCTURALLY ALTERED , UNLESS OTHERWISE PROVIDED FOR IN THIS P.U.D., EXCEPT FOR SINGLE–FAMILY DWELLINGS. INCLUDING HOMES BUILT ON SITE . SINGLE–FAMILY DWELLINGS MAY INCLUDE HOME OCCUPATIONS.

ACCESSORY BUILDINGS TYPICALLY FOUND WITH THE ABOVE–PERMITTED USES SHALL BE ALLOWED.AN ACCESSORY BUILDING OR UTILITY SHED MAY NOT BE LOCATED SO AS TO ENCROACH ON ADJACENT PUBLIC OR PRIVATE PROPERTY OR EASEMENTS. IN NO INSTANCE SHALL AN ACCESSORY BUILDING OR UTILITY SHED BE PERMITTED IN THE FRONT YARD. SAID BUILDINGS SHALL BE SET BACK A MINIMUM OF TWENTY (20) FEET FROM ANY SIDE STREET ON A CORNER LOT. ONLY ONE (1) ACCESSORY BUILDING PER PLATTED LOT IS ALLOWED . ACCESSORY STRUCTURES SHALL ONLY BE ALLOWED AFTER THE PRINCIPAL DWELLING HAS BEEN PERMITTED AND CONSTRUCTED ON THE LOT. UTILITY SHEDS SHALL NOT BE CONSIDERED ACCESSORY BUILDINGS. BUT MAY NOT EXCEED 250 S.F. GFA.

BUILDING WALLS SHALL NOT BE WITHIN THE DEFINED SETBACKS AND EASEMENTS . ROOF OVERHANGS , CANTILEVERS , WINDOW WELLS AND FOOTERS MAY EXTEND THREE FEET OVER SETBACK LINES WHERE NOT ENCROACHING UPON EASEMENTS . REFER TO ARTICLE V SEC. 16–101 OF THE CITY OF FORT LUPTON MUNICIPAL CODE FOR GENERAL FENCING PROVISIONS. FENCING SHALL BE VINYL WITH COLOR APPROVED BY FORT LUPTON PLANNING DEPARTMENT PRIOR TO INSTALLATION.




RESIDENTIAL STREET SECTION
NOT TO SCALE

811 Know what's **below.** **Call** before you dig.

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| H–SCALE | N/A |
| V–SCALE | N/A |
| DATE | 11/17/21 |
| DESIGNED BY | ANI |
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| CHECKED BY | |

COYOTE CREEK FILING NO. 4
COVER SHEET

SHEET 1 OF 46

JOB NO. 16093.00

# COYOTE CREEK FILING NO. 4

## GRADING AND EROSION CONTROL NOTES

A. ALL SITE GRADING (EXCAVATION, EMBANKMENT, AND COMPACTION) SHALL CONFORM TO THE RECOMMENDATIONS OF THE LATEST SOILS INVESTIGATION FOR THIS PROPERTY AND SHALL FURTHER BE IN CONFORMANCE WITH THE CITY OF FORT LUPTON'S "STANDARDS AND SPECIFICATIONS FOR THE DESIGN AND CONSTRUCTION OF PUBLIC IMPROVEMENTS," LATEST EDITION.

B. NATURAL VEGETATION SHALL BE RETAINED AND PROTECTED WHEREVER POSSIBLE. EXPOSURE OF SOIL TO EROSION BY REMOVAL OR DISTURBANCE OF VEGETATION SHALL BE LIMITED TO THE AREA REQUIRED FOR IMMEDIATE CONSTRUCTION OPERATION AND FOR THE SHORTEST PRACTICAL PERIOD OF TIME.

C. TOPSOIL SHALL BE STOCKPILED TO THE EXTENT PRACTICABLE ON THE SITE FOR USE ON AREAS TO BE REVEGETATED. ANY AND ALL STOCKPILES SHALL BE LOCATED AND PROTECTED FROM EROSIVE ELEMENTS.

D. TEMPORARY VEGETATION SHALL BE INSTALLED ON ALL DISTURBED AREAS WHERE PERMANENT SURFACE IMPROVEMENTS ARE NOT SCHEDULED FOR INSTALLATION WITHIN THREE MONTHS. VEGETATION SHALL BE A VIGOROUS, DROUGHT TOLERANT, NATIVE SPECIES MIX. (REFER TO SECTION 2.26.00 OF THESE STANDARDS AND SPECIFICATIONS FOR SEEDING MIX.) PROJECT SCHEDULING SHOULD TAKE ADVANTAGE OF SPRING OR FALL PLANTING SEASONS FOR NATURAL GERMINATION, BUT SEEDED AREAS SHALL BE IRRIGATED, IF CONDITIONS SO MERIT.

E. AT ALL TIMES, THE PROPERTY SHALL BE MAINTAINED AND/OR WATERED TO PREVENT WIND-CAUSED EROSION. EARTHWORK OPERATIONS SHALL BE DISCONTINUED WHEN FUGITIVE DUST SIGNIFICANTLY IMPACTS ADJACENT PROPERTY. IF EARTHWORK IS COMPLETE OR DISCONTINUED AND DUST FROM THE SITE CONTINUES TO CREATE PROBLEMS, THE OWNER/DEVELOPER SHALL IMMEDIATELY INSTITUTE MITIGATIVE MEASURES AND SHALL CORRECT DAMAGE TO ADJACENT PROPERTY.

F. TEMPORARY CUT/FILL SLOPES SHALL NOT EXCEED A STEEPNESS OF 2:1 (2H:1V). PERMANENT SLOPES SHALL NOT EXCEED 4:1 (4H:1V) IN AREAS TO BE SEEDED OR SODDED.

G. UTILITY CONSTRUCTION IS NOT APPROVED UNDER THIS PLAN.

H. THE OWNER/DEVELOPER SHALL PROVIDE ANY ADDITIONAL DUST ABATEMENT AND EROSION CONTROL MEASURES DEEMED NECESSARY BY THE CITY, SHOULD CONDITIONS MERIT THEM.

I. TEMPORARY FENCES SHALL BE INSTALLED ALONG ALL BOUNDARIES OF THE CONSTRUCTION LIMITS OR PROPERTY LINES AS SHOWN ON THE APPROVED EROSION CONTROL PLAN, TO PREVENT GRADING ON PROPERTY NOT OWNED BY THE DEVELOPER. IN ADDITION, THE CITY MAY REQUIRE ADDITIONAL TEMPORARY FENCES IF FIELD CONDITIONS SO MERIT THEM.

## SANITARY SEWER NOTES:

1. ALL SANITARY SEWER CONSTRUCTION SHALL CONFORM TO THE CITY OF FORT LUPTON ENGINEERING AND SPECIFICATIONS, LATEST VERSION.
2. ALL SEWER LINES SHALL BE PVC-ASTM D-3034, SDR 35 OR APPROVED EQUAL. ALL SEWER MAIN LINE SIZE 8" IN DIAMETER, UNLESS OTHERWISE NOTED.
3. SEWER LINES SHALL BE INSTALLED 5.00 FEET NORTH OR EAST OF STREET CENTERLINE, UNLESS OTHERWISE SHOWN ON PLANS. SEWER LINES SHALL BE 10.00 FEET FROM WATER LINES EXCEPT WHEN CROSSING EACH OTHER. SEWER LINES WHICH CROSS LESS THAN 1.50 FEET VERTICALLY FROM THE WATER MAIN SHALL BE ENCASED IN CONCRETE. USE RUBBER GASKETS FOR PVC ENCASEMENT.
4. SEWER RIM ELEVATIONS SHOWN ARE APPROXIMATE ONLY AND ARE NOT TO BE TAKEN AS FINAL ELEVATIONS. RING AND COVER SHALL BE SET IN CENTERED CONCRETE RINGS WITH RAM-NEK FOR ADJUSTMENT TO MATCH FINAL PAVEMENT ELEVATIONS.
5. THE CONTRACTOR AND SURVEY CREW SHALL VERIFY ELEVATIONS OF EXISTING SEWER LINES AND MANHOLES TO BE TIED TO PRIOR TO CONSTRUCTION OR STAKING OF SANITARY SEWER.
6. GRAVEL AND/OR TILE UNDERDRAINS SHALL BE INSTALLED IN ALL SEWER MAIN TRENCHES AS SHOWN ON THE SANITARY PLAN AND PROFILE SHEETS. UNDERDRAINS SHALL BE PVC-ASTM D-3034, SDR 35 INSTALLED WITHOUT GASKETS. THE CITY OF FORT LUPTON IS NOT RESPONSIBLE FOR MAINTENANCE OF UNDERDRAINS. SIZE OF UNDERDRAIN SERVICES SHALL BE 3".
7. SEWER SERVICE TEES FOR EACH UNIT SHALL BE STAKED BY A SURVEY CREW AND FURNISHED AND INSTALLED BY THE CONTRACTOR. THE CONTRACTOR SHALL FURNISH TO THE ENGINEER "AS-CONSTRUCTED" LOCATION OF TEES. SEWER WYES SHALL BE USED RATHER THAN TEES.
8. ALL MANHOLES SHALL BE 48-INCHES IN DIAMETER WITH 24-INCH RING AND COVER, ECCENTRIC CONE UNLESS OTHERWISE SPECIFIED.
9. PIPE BEDDING SHALL BE CLASS "B" AND SHALL CONFORM TO ASTM C-33 OR D-448 GRADATION NO. 6 OR 67.
10. AT LEAST FIVE (5) DAYS PRIOR TO THE START OF CONSTRUCTION, A PRE-CONSTRUCTION MEETING WILL BE HELD AT THE OFFICE OF THE PUBLIC WORKS MANAGER AND ATTENDED BY THE CONTRACTOR AND REPRESENTATIVES OF THE OTHER APPROVING AGENCIES. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO CONTACT THE PUBLIC WORKS MANAGER TO SCHEDULE THIS MEETING.
11. ALL PIPE LENGTHS ARE APPROXIMATE.
12. THE CONTRACTOR SHALL HAVE IN HIS POSSESSION AT ALL TIMES ONE (1) SIGNED COPY OF THE PLANS WHICH HAVE BEEN APPROVED BY THE CITY OF FOR LUPTON AND THE PUBLIC WORKS MANAGER.
13. ALL MANHOLES SHALL HAVE SHAPED INVERTS.
14. PRIOR TO THE START OF ANY WORK WHERE SEWER MAIN TO BE INSTALLED TIES INTO EXISTING CITY SEWER SYSTEMS, THE NEAREST MANHOLE TO THE POINT OF TIE-IN SHALL BE PLUGGED WITH A PLUMBER'S PLUG ON THE INLET SIDE BY THE CONTRACTOR. THIS PLUG SHALL REMAIN IN PLACE UNTIL FINAL ACCEPTANCE BY THE DISTRICT. IT'S PURPOSE SHALL BE TO PREVENT MUD, WATER, OR OTHER MATERIALS FROM ENTERING THE EXISTING LINE DURING CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PUMPING AND CLEANING THESE MANHOLES AND REMOVING THE PLUG WHEN SO INSTRUCTED BY THE PUBLIC WORKS MANAGER.
15. WHEN SANITARY SEWER SERVICES ARE GREATER THAN OR EQUAL TO ONE HUNDRED FEET IN LENGTH, THE CONTRACTOR SHALL INSTALL A CLEAN-OUT BEHIND THE SIDEWALK WHEN MAKING THE CONNECTION TO THE HOME.

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| H-SCALE | N/A |
| V-SCALE | N/A |
| DATE | 12/13/21 |
| DESIGNED BY | AJH |
| DRAWN BY | AJH |
| CHECKED BY | |

COYOTE CREEK FILING NO. 4

GENERAL NOTES

SHEET 2 OF 46

JOB NO. 16093.00

# COYOTE CREEK FILING NO. 4

## LAYER LINETYPE LEGEND

| | EXISTING | PROPOSED |
|---|---|---|
| PHASE LINE | | |
| MATCH LINE | | |
| SECTION LINE | | |
| BOUNDARY LINE | | |
| PROPERTY LINE | | |
| EASEMENT LINE | | |
| RIGHT OF WAY | | |
| R.O.W. A LINE | A | A |
| CENTERLINE | | |
| CITY LIMITS | | |
| WIRE FENCE | | |
| CHAIN LINK FENCE | | |
| WOOD FENCE | | |
| MASONRY FENCE | | |
| GUARDRAIL | | |
| CONC. BARRIER | | |
| CABLE TV | TV | TV |
| ELECTRIC | E | E |
| FIBER OPTIC | FO | FO |
| GAS MAIN | G | G |
| IRRIGATION MAIN | IRR | IRR |
| OIL/PETRO. MAIN | O | O |
| OVERHEAD UTILITY | OHU | OHU |
| SANITARY SEWER | S | |
| STORM DRAIN | | |
| TELEPHONE | T | T |
| WATER MAIN | W | |
| RAW WATER LINE | RWL | RWL |
| SWALE/WATERWAY FLOWLINE | | |
| DIVERSION DITCH | | |
| DIVERSION CHANNEL | | |
| MAJOR DRAINAGE BASIN | | |
| MINOR DRAINAGE BASIN | | |
| TOP OF SLOPE | | |
| TOE OF SLOPE | | |
| EDGE OF WATER | | |
| INDEX CONTOUR | 6100 | 6100 |
| INTERMEDIATE CONTOUR | | |
| DEPRESSION CONT. (INDEX) | 6100 | 6100 |
| DEPRESSION CONT. (INTER) | | |
| TOP OF CUTS | | |
| TOE OF FILLS | | |
| CUT AND FILL LINE | | C/F |
| SILT FENCE | SF | SF |
| 100 YEAR FLOODPLAIN | 100YR | 100YR |
| 500 YEAR FLOODPLAIN | 500YR | 500YR |
| FLOODWAY | FLDWY | FLDWY |
| BASE FLOOD ELEVATION | | |
| EDGE OF WETLANDS | | |
| STONE WALL | | |

## UTILITIES LEGEND

| | EXISTING | PROPOSED |
|---|---|---|
| **STORM SEWER** | | |
| MANHOLE | Ⓢ | ◉ |
| STORM INLET | | ▣ |
| AREA INLET – SQUARE | □ | |
| AREA INLET – ROUND | ○ | |
| FLARED END SECTION | ▷ | |
| RIPRAP | | |
| **SANITARY SEWER** | | |
| LINE MARKER | Mkr San | |
| SERVICE MARKER | | |
| CLEAN–OUT | | |
| MANHOLE W/ DIRECTIONAL FLOW ARROW | | |
| **WATER LINE** | | |
| LINE MARKER | Mkr W | |
| SERVICE MARKER | | |
| FIRE HYDRANT | | |
| FIRE CONNECTION | | |
| MANHOLE | Ⓦ | ● |
| BEND | | |
| BLOW–OFF VALVE | | |
| WELL | WELL | WELL |
| METER | Ⓜ | ● |
| VALVE | | |
| REDUCER | | |
| THRUST BLOCK | | |
| CROSS | | |
| PLUG W/ THRUST BLOCK | | |
| TEE | | |
| REVERSE ANCHOR | | |
| ANODE | | |
| AIR & VACUUM VALVE ASSEMBLY | | |
| TRANSMISSION BLOW–OFF ASSEMBLY | | |
| **GAS LINE** | | |
| MARKER | Mkr G | |
| SERVICE MARKER | | |
| METER | Ⓖ | ● |
| VALVE | | |
| PLUG | | |
| TEE | | |
| **DRY UTILITIES** | | |
| CABLE TV MARKER | Mkr TV | |
| CABLE TELEVISION PEDESTAL | TV | |
| ELECTRIC MARKER | Mkr E | |
| ELECTRIC SERVICE MARKER | | |
| ELECTRICAL PEDESTAL | E | |
| ELECTRICAL METER | Ⓔ | |
| ELECTRICAL MANHOLE | Ⓔ | |
| FIBER–OPTIC MARKER | Mkr FO | |
| IRRIGATION PEDESTAL | I | |
| TELEPHONE MARKER | Mkr T | |
| TELEPHONE PEDESTAL | T | |
| TELEPHONE MANHOLE | Ⓣ | |
| UTILITY POLE | | |
| GUY ANCHOR | | |
| GUY POLE | | |
| **MISC. UTILITIES** | | |
| VENT PIPE | VP | VP |
| TEST HOLE DESIGNATOR | TH# FIRM AGENCY | |

## MONUMENTATION LEGEND

| | |
|---|---|
| ALUMINUM CAP – FOUND | AC |
| BRASS CAP – FOUND | BC |
| BENCHMARK – FOUND | |
| CROSS – FOUND | + |
| MONUMENT – SET | ○ |
| MONUMENT – FOUND (DEFAULT) | ● |
| MONUMENT – FOUND (ALTERNATE 1) | ■ |
| MONUMENT – FOUND (ALTERNATE 2) | ◉ |
| MONUMENT – FOUND (ALTERNATE 3) | ▲ |
| MONUMENT – FOUND (ALTERNATE 4) | ◬ |
| MONUMENT – FOUND (ALTERNATE 5) | ⬟ |
| MONUMENT – FOUND (ALTERNATE 6) | ❁ |
| MONUMENT – FOUND (ALTERNATE 7) | ◭ |
| NAIL & WASHER – FOUND | NAIL & WASHER |
| PANEL – FOUND | |
| PK NAIL – FOUND | PK NAIL |
| ROW MONUMENT – FOUND | |
| ROW MARKER – FOUND | ⊡ |
| SECTION CORNER – FOUND | |
| SECTION CORNER – SET | |
| QUARTER–SECTION CORNER – FOUND | |
| QUARTER–SECTION CORNER – SET | |
| SECTION CENTER – FOUND | ◉ |
| SECTION CENTER – FOUND | ◎ |
| CONTROL/TRAVERSE POINT – SET | △ |

## TRAFFIC LEGEND

| | EXISTING | PROPOSED |
|---|---|---|
| PARKING METER | | |
| TRAFFIC SIGNAL BOX | | |
| TRAFFIC SIGNAL POLE | | |
| TRAFFIC SIGNAL | | |
| BARRICADE | | |
| GUARD RAIL POST | | |
| IMPACT ATTENUATOR | | |
| BRIDGE STYLE HIGHWAY SIGN POST | | |
| CANTILEVER STYLE HIGHWAY SIGN POST | | |
| SIGN | | |
| RAILROAD MARKER/SIGN | RR | |
| STREET LIGHT | | |
| STREET LIGHT – SINGLE | | |
| STREET LIGHT – DOUBLE | | |
| LUMINAIRE | | |
| ALTERNATE LUMINAIRE | | |
| SIGNAL MAST ARM W/ LUMINAIRE | | |
| PEDESTAL POLE FOUNDATION | | |
| TRAFFIC SIGNAL POLE | | |
| ROUND PULL BOX | | |
| MEDIUM PULL BOX | | |
| LARGE PULL BOX (20X33X15) | | |
| SIGNAL HEAD WITHOUT BACK PLATE | | |
| SIGNAL HEAD WITH BACK PLATE | | |
| PEDESTRIAN SIGNAL HEAD | | |
| VIDEO IMAGE DETECTOR | | |
| OPTICOM DETECTOR | | |
| VEHICLE DETECTION ZONE | | V |

## STORM WATER MANAGEMENT

| | KEY | SYMBOL |
|---|---|---|
| CHECK DAM | CD | |
| CONSTRUCTION ROAD STABILIZATION | CRS | |
| CURB SOCK INLET PROTECTION | CS | |
| CONCRETE WASHOUT AREA | CWA | |
| DIVERSION DITCH AND DIKE, TEMPORARY | DD | |
| DIVERSION CHANNEL, TEMPORARY | DV | |
| DEWATERING | DW | |
| EROSION CONTROL BLANKET | ECB | |
| INLET FILTER | IF | |
| INLET PROTECTION | IP | |
| MULCHING | MU | |
| OUTLET PROTECTION | OP | |
| PAVED FLUME | PF | |
| PERMENENT SEEDING | PS | |
| REINFORCED CONCRETE DAM | RCD | |
| ROUGH CUT STREET CONTROL | RCS | |
| SEDIMENT BASIN | SB | |
| SEDIMENT CONTROL LOG | SCL | |
| SILT FENCE | SF | |
| SURFACE ROUGHENING | SR | |
| STABILIZED STAGING AREA | SSA | |
| SEDIMENT TRAP | ST | |
| STRAW BALE BARRIER | STB | |
| TERRACING | TER | |
| TEMPORARY SEEDING | TS | |
| TEMPORARY STREAM CROSSING CULVERT/BRIDGE | TSC C | |
| TEMPORARY STREAM CROSSING FORD TYPE | TSC F | |
| TEMPORARY SLOPE DRAIN | TSD | |
| VEHICLE TRACKING CONTROL | VTC | |
| VEHICLE TRACKING CONTROL WITH WASH RACK | WR | |

## DRAINAGE REPORT PLANS

| | KEY |
|---|---|
| BASIN DESIGNATION (NO COEFFICIENT) | # / #.# |
| BASIN DESIGNATION (1 COEFFICIENT) | # / #.# \| # |
| BASIN DESIGNATION (2 COEFFICIENTS) | # / #.# \| # |
| ANALISYS POINT IDENTIFIER | # |
| BASIN DESIGNATION (HISTORIC) | # / #.# |
| BASIN DESIGNATION (DEVELOPED) | # / #.# |
| SUB–BASIN DESIGNATION (DEVELOPED) | # / ## |
| DRAINAGE PIPE IDENTIFIER | ## |
| DRAINAGE POINT IDENTIFIER (HEXAGONAL) | ## |
| DRAINAGE POINT IDENTIFIER (TRIANGULAR) | ? |
| SWMM DESIGNATION 1 | # |
| SWMM DESIGNATION 2 | # |
| SWMM DESIGNATION 3 | # |
| SWMM DESIGNATION 4 | ? |

## LANDSCAPE LEGEND

| | EXISTING | PROPOSED |
|---|---|---|
| TREE – CONIFEROUS | | |
| TREE – DECIDUOUS | | |
| SHRUB/BUSH | | |
| SHRUBS AND BUSHES | | |
| IRRIGATION BOX | | |
| IRRIGATION SPRINKLER | | |
| IRRIGATION VALVE | | |
| BOLLARD | | |
| FLAGPOLE | | FP |

UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, JR ENGINEERING APPROVES THEIR USE ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

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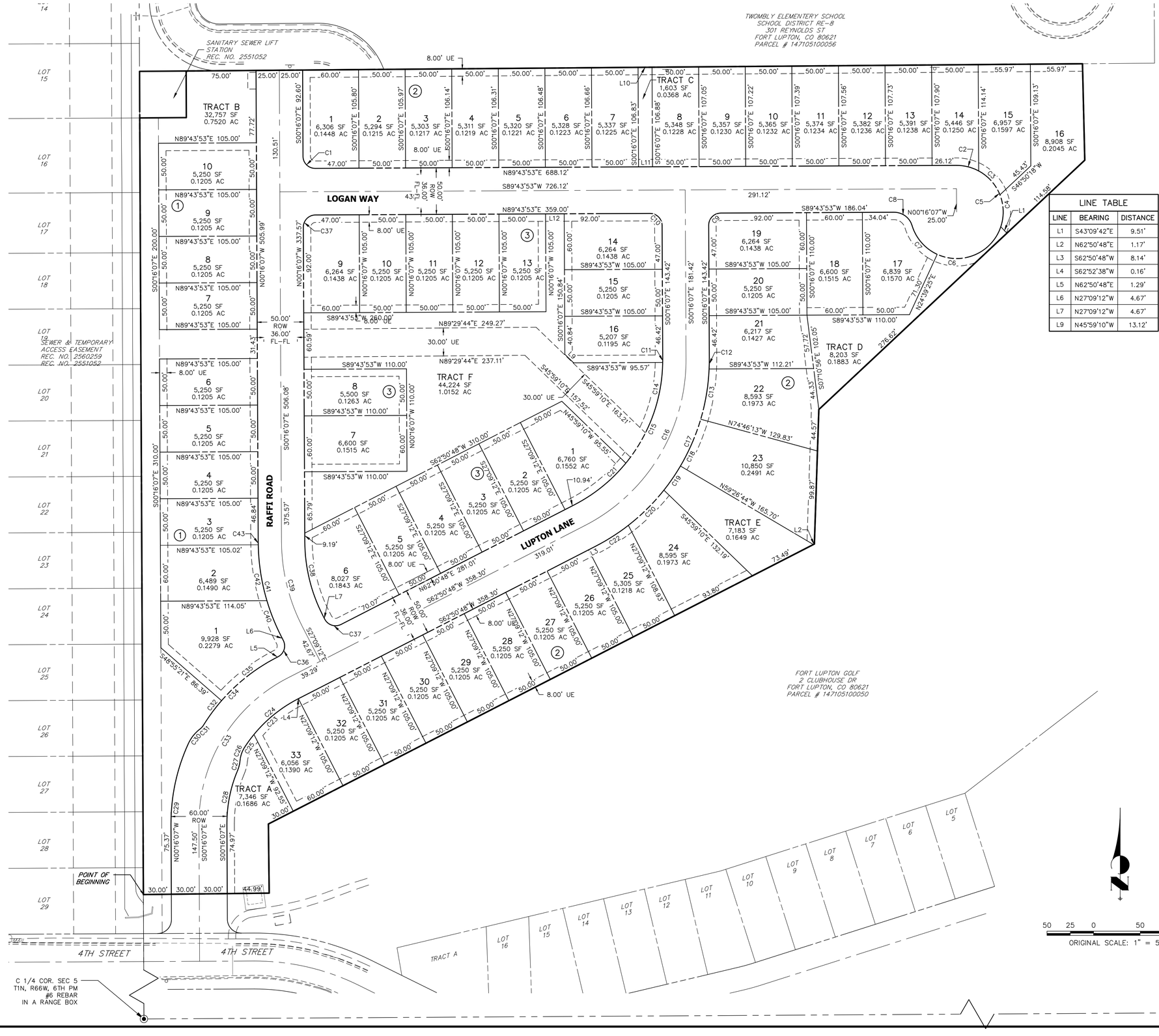
| H-SCALE | N/A |
| V-SCALE | N/A |
| DATE | 12/13/21 |
| DESIGNED BY | AJH |
| DRAWN BY | AJH |
| CHECKED BY | |

COYOTE CREEK FILING NO. 4

OVERALL LEGEND

SHEET 3 OF 46

JOB NO. 16093.00




| LINE TABLE | | |
|---|---|---|
| LINE | BEARING | DISTANCE |
| L1 | S43°09'42"E | 9.51' |
| L2 | N62°50'48"E | 1.17' |
| L3 | S62°50'48"W | 8.14' |
| L4 | S62°52'38"W | 0.16' |
| L5 | N62°50'48"E | 1.29' |
| L6 | N27°09'12"W | 4.67' |
| L7 | N27°09'12"W | 4.67' |
| L9 | N45°59'10"W | 13.12' |

| CURVE TABLE | | | | |
|---|---|---|---|---|
| CURVE | DELTA | RADIUS | LENGTH | CHORD |
| C1 | 90°00'00" | 13.00' | 20.42' | S45°16'07"E 18.38' |
| C2 | 28°31'44" | 50.00' | 24.90' | N76°00'15"W 24.64' |
| C3 | 40°06'33" | 50.00' | 35.00' | N41°41'07"W 34.29' |
| C4 | 40°06'33" | 50.00' | 35.00' | N01°34'34"W 34.29' |
| C5 | 253°23'54" | 50.00' | 221.13' | N36°25'51"E 80.18' |
| C8 | 73°23'54" | 20.00' | 25.62' | N53°34'09"W 23.90' |
| C9 | 90°00'00" | 13.00' | 20.42' | S44°43'53"W 18.38' |
| C10 | 90°00'00" | 13.00' | 20.42' | N45°16'07"W 18.38' |
| C11 | 1°10'19" | 175.00' | 3.58' | N00°19'03"E 3.58' |
| C12 | 2°46'17" | 225.00' | 10.88' | N01°07'02"E 10.88' |
| C13 | 13°56'57" | 225.00' | 54.78' | N09°28'39"E 54.64' |
| C14 | 38°23'55" | 175.00' | 117.28' | N20°06'10"E 115.10' |
| C15 | 63°06'55" | 175.00' | 192.77' | N31°17'21"E 183.17' |
| C17 | 63°06'55" | 225.00' | 247.85' | N31°17'21"E 235.51' |
| C18 | 13°58'29" | 225.00' | 54.88' | N23°26'23"E 54.74' |
| C19 | 8°00'31" | 225.00' | 31.45' | N34°25'53"E 31.42' |
| C20 | 13°41'21" | 225.00' | 53.76' | N45°16'49"E 53.63' |
| C21 | 23°32'40" | 175.00' | 71.91' | N51°04'28"E 71.41' |
| C22 | 10°43'19" | 225.00' | 42.10' | N57°29'09"E 42.04' |
| C23 | 23°30'43" | 150.00' | 61.55' | S51°05'27"W 61.12' |

| CURVE TABLE | | | | |
|---|---|---|---|---|
| CURVE | DELTA | RADIUS | LENGTH | CHORD |
| C24 | 29°55'48" | 150.00' | 78.36' | S47°52'54"W 77.47' |
| C25 | 6°25'05" | 150.00' | 16.80' | S36°07'33"W 16.79' |
| C26 | 27°40'04" | 32.00' | 15.45' | S19°04'59"W 15.30' |
| C27 | 17°37'16" | 36.00' | 11.07' | N14°03'35"E 11.03' |
| C28 | 23°08'19" | 145.00' | 58.56' | S11°18'03"W 58.16' |
| C29 | 24°48'28" | 205.00' | 88.76' | S12°08'07"W 88.07' |
| C30 | 27°59'58" | 42.00' | 20.52' | S38°32'20"W 20.32' |
| C31 | 20°50'59" | 15.00' | 5.46' | N42°06'50"E 5.43' |
| C32 | 9°23'19" | 200.00' | 32.77' | S36°22'59"W 32.74' |
| C34 | 31°09'28" | 200.00' | 108.76' | S47°16'04"W 107.43' |
| C35 | 21°46'10" | 200.00' | 75.99' | S51°57'44"W 75.53' |
| C36 | 90°00'00" | 13.00' | 20.42' | N17°50'48"E 18.38' |
| C37 | 90°00'00" | 13.00' | 20.42' | S44°43'53"W 18.38' |
| C37 | 90°00'00" | 13.00' | 20.42' | S72°09'12"E 18.38' |
| C38 | 26°53'05" | 175.00' | 82.11' | S13°42'39"E 81.36' |
| C40 | 10°34'57" | 225.00' | 41.56' | S21°51'43"E 41.50' |
| C41 | 26°53'05" | 225.00' | 105.58' | S13°42'39"E 104.61' |
| C42 | 15°29'53" | 225.00' | 60.86' | S08°49'19"E 60.67' |
| C43 | 0°48'16" | 225.00' | 3.16' | S00°40'14"E 3.16' |

811 Know what's below. Call before you dig.

UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, JR ENGINEERING APPROVES THEIR USE ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

PREPARED FOR
LUPTON LAND, LLC
10221 PRESTWICK TRAIL
LONE TREE, CO 80124
BOB QUINETTE
303-587-1966

J·R ENGINEERING
A Westrian Company
Centennial 303-740-9393 • Colorado Springs 719-593-2593
Fort Collins 970-491-9888 • www.jrengineering.com

| No. | REVISION | BY | DATE |
|---|---|---|---|
| | | | |

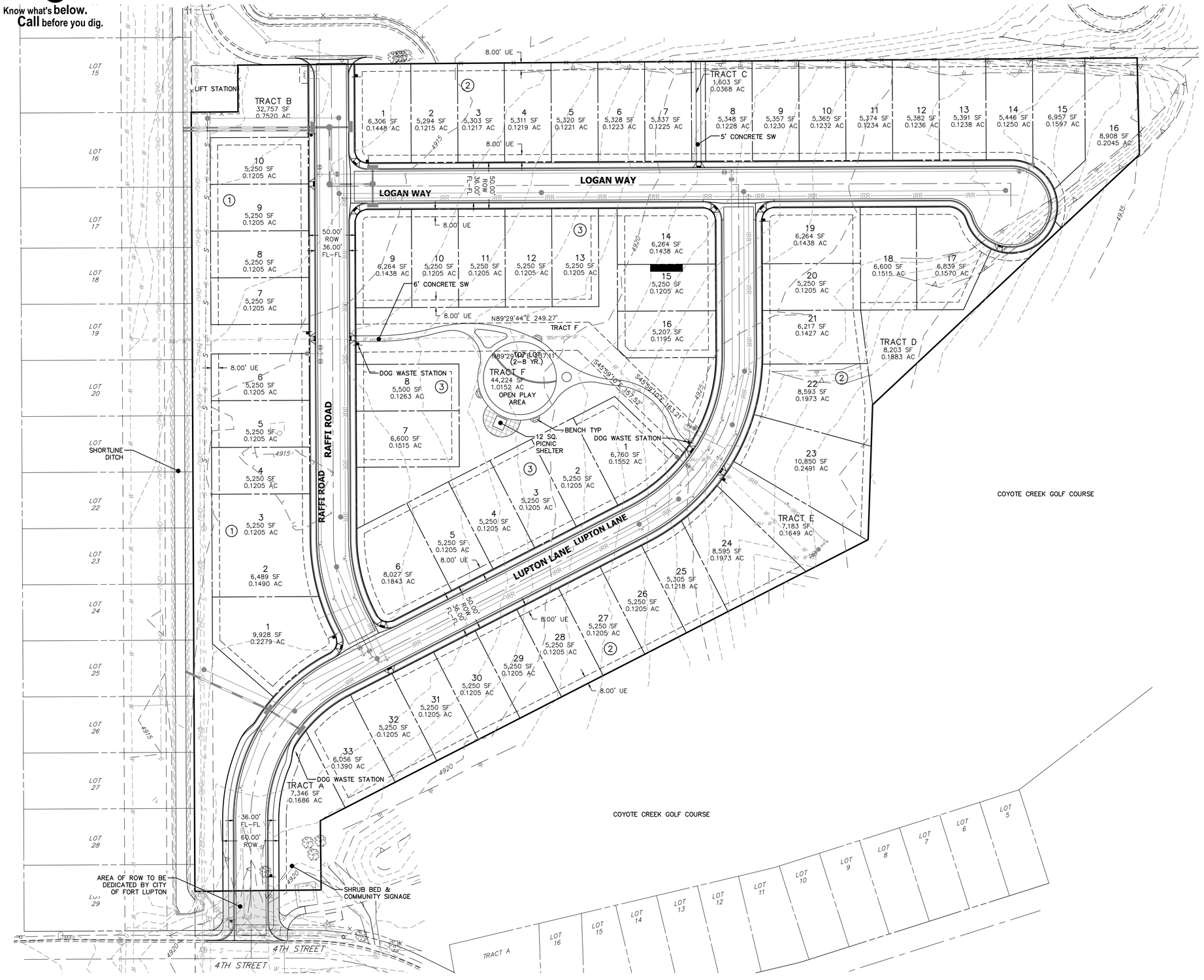
H-SCALE 1"=50'
V-SCALE 1"=X'
DATE 12/13/21
DESIGNED BY ANI
DRAWN BY ANI
CHECKED BY

# COYOTE CREEK FILING NO. 4
## PUD FINAL PLAT

SHEET 4 OF 46
JOB NO. 16093.00

# COYOTE CREEK FILING NO. 4

Know what's **below.** **Call** before you dig.




## SITE LEGEND

- BOUNDARY LINE
- PROPERTY LINE
- EXISTING EASEMENT LINE
- PROPOSED EASEMENT LINE
- RIGHT OF WAY
- EXISTING WOODEN FENCE
- EXISTING GAS MAIN
- EXISTING SANITARY SEWER
- PROPOSED SANITARY SEWER
- EXISTING WATER MAIN
- PROPOSED WATER MAIN
- PROPOSED ELECTRIC
- EXISTING STORM DRAIN
- PROPOSED STORM DRAIN
- EXISTING CURB AND GUTTER
- PROPOSED SIGN
- PROPOSED CURB AND GUTTER
- EXISTING STREET LIGHTS
- PROPOSED STREET LIGHT
- 3/4" METER VAULTS
- FIRE HYDRANT

N

50 25 0 50 100

ORIGINAL SCALE: 1" = 50'

UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, JR ENGINEERING APPROVES THEIR USE ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

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| No. | REVISION | BY | DATE |
|---|---|---|---|
| | | | |

| | |
|---|---|
| H-SCALE | 1"=50' |
| V-SCALE | 1"=X' |
| DATE | 12/13/21 |
| DESIGNED BY | AJH |
| DRAWN BY | XXX |
| CHECKED BY | |

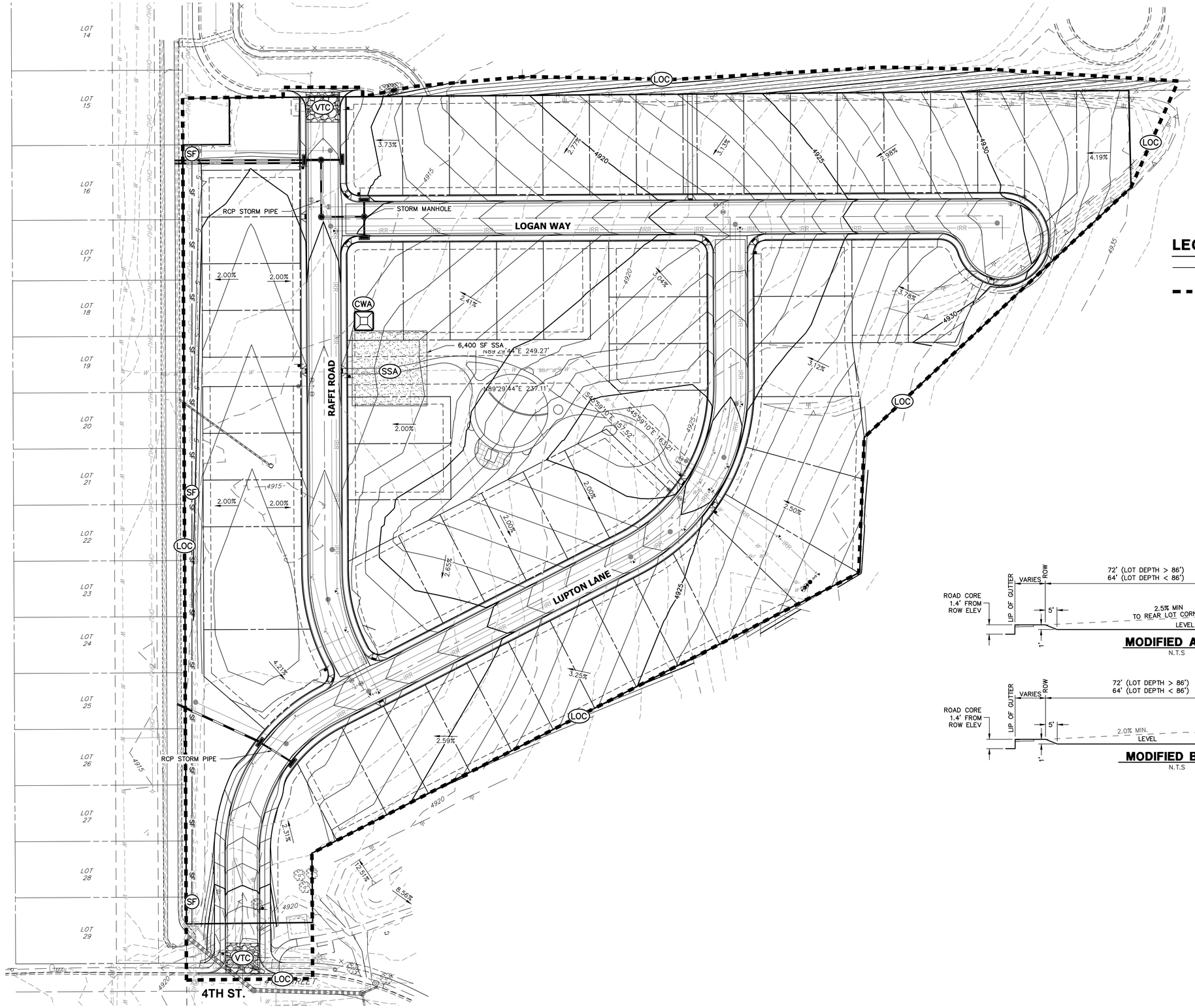
COYOTE CREEK FILING NO. 4

FINAL SITE PLAN

SHEET 5 OF 46

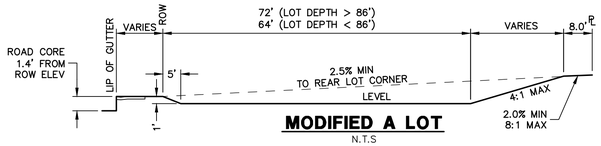
JOB NO. 16093.00

# COYOTE CREEK FILING NO. 4

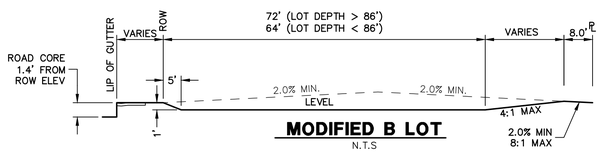



## LEGEND

- SF — SILT FENCE
- LOC — LIMITS OF CONSTRUCTION
- VTC — VEHICLE TRACKING CONTROL
- CWA — CONCRETE WASHOUT AREA
- IP — INLET PROTECTION
- SCL — SEDIMENT CONTROL LOG
- SSA — STABILIZED STAGING AREA




**MODIFIED A LOT**
N.T.S




**MODIFIED B LOT**
N.T.S

50 25 0 50 100
ORIGINAL SCALE: 1" = 50'

811 Know what's below. Call before you dig.

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PREPARED FOR
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| No. | REVISION | BY | DATE |
|---|---|---|---|
| | | | |

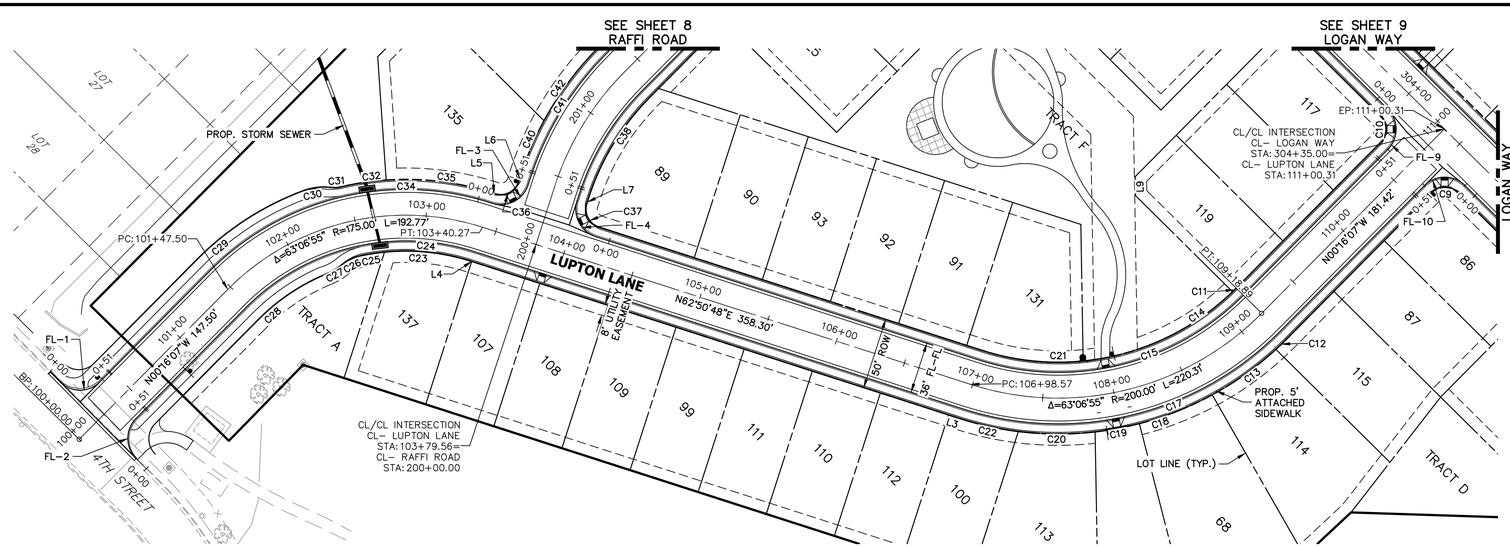
| | |
|---|---|
| H-SCALE | 1"=50' |
| V-SCALE | N/A |
| DATE | 12/13/21 |
| DESIGNED BY | AJH |
| DRAWN BY | CRB |
| CHECKED BY | |

COYOTE CREEK FILING NO. 4

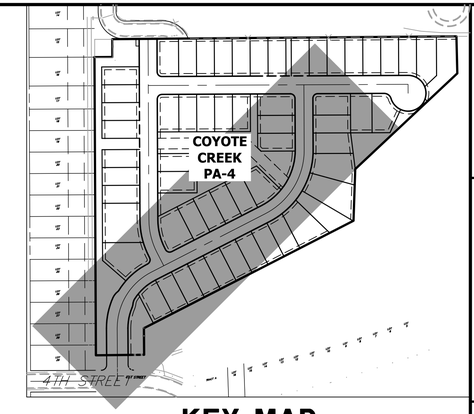
FINAL GRADING & EROSION CONTROL PLAN

SHEET 4 OF 46

JOB NO. 16093.00

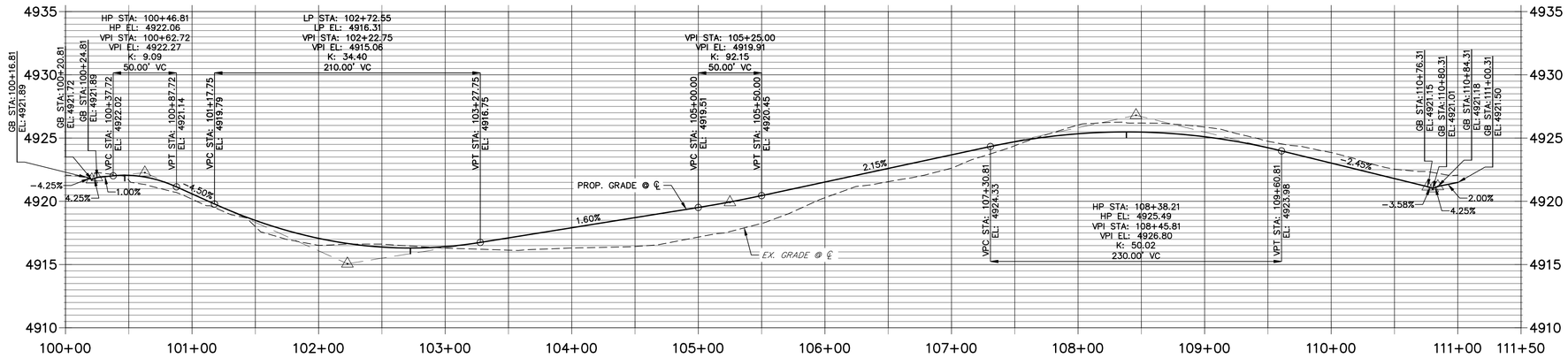



LUPTON LANE
STA. 100+00.00 TO 111+00.31




**KEY MAP**
N.T.S.

# CL- LUPTON LANE PROFILE
# STA 100+00.00 TO 111+50.00

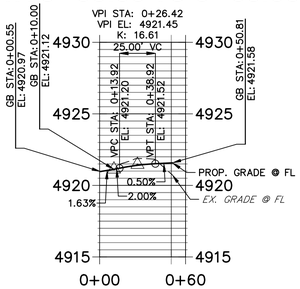



| LINE TABLE | | |
|---|---|---|
| LINE | BEARING | DISTANCE |
| L1 | S43°09'42"E | 9.51' |
| L2 | N62°50'48"E | 1.17' |
| L3 | S62°50'48"W | 8.14' |
| L4 | S62°52'38"W | 0.16' |
| L5 | N62°50'48"E | 1.29' |
| L6 | N27°09'12"W | 4.67' |
| L7 | N27°09'12"W | 4.67' |
| L9 | N45°59'10"W | 13.12' |

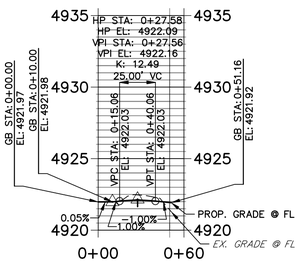
| CURVE TABLE | | | | |
|---|---|---|---|---|
| CURVE | DELTA | RADIUS | LENGTH | CHORD |
| C1 | 90°00'00" | 13.00' | 20.42' | S45°16'07"E 18.38' |
| C2 | 28°31'44" | 50.00' | 24.90' | N76°00'15"W 24.64' |
| C3 | 40°06'33" | 50.00' | 35.00' | N41°41'07"W 34.29' |
| C4 | 40°06'33" | 50.00' | 35.00' | N01°34'34"W 34.29' |
| C5 | 253°23'54" | 50.00' | 221.13' | N36°25'51"E 80.18' |
| C8 | 73°23'54" | 20.00' | 25.62' | N53°34'09"W 23.90' |
| C9 | 90°00'00" | 13.00' | 20.42' | S44°43'53"W 18.38' |
| C10 | 90°00'00" | 13.00' | 20.42' | N45°16'07"W 18.38' |
| C11 | 1°10'19" | 175.00' | 3.58' | N00°19'03"E 3.58' |
| C12 | 2°46'17" | 225.00' | 10.88' | N01°07'02"E 10.88' |
| C13 | 13°56'57" | 225.00' | 54.78' | N09°28'39"E 54.64' |
| C14 | 38°23'55" | 175.00' | 117.28' | N20°06'10"E 115.10' |
| C15 | 63°06'55" | 175.00' | 192.77' | N31°17'21"E 183.17' |
| C17 | 63°06'55" | 225.00' | 247.85' | N31°17'21"E 235.51' |
| C18 | 13°58'29" | 225.00' | 54.88' | N23°26'23"E 54.74' |
| C19 | 8°00'31" | 225.00' | 31.45' | N34°25'53"E 31.42' |
| C20 | 13°41'21" | 225.00' | 53.76' | N45°16'49"E 53.63' |
| C21 | 23°32'40" | 175.00' | 71.91' | N51°04'28"E 71.41' |
| C22 | 10°43'19" | 225.00' | 42.10' | N57°29'09"E 42.04' |
| C23 | 23°30'43" | 150.00' | 61.55' | S51°05'27"W 61.12' |

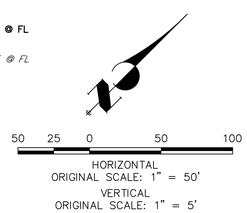
| CURVE TABLE | | | | |
|---|---|---|---|---|
| CURVE | DELTA | RADIUS | LENGTH | CHORD |
| C24 | 29°55'48" | 150.00' | 78.36' | S47°52'54"W 77.47' |
| C25 | 6°25'05" | 150.00' | 16.80' | S36°07'33"W 16.79' |
| C26 | 27°40'04" | 32.00' | 15.45' | S19°04'59"W 15.30' |
| C27 | 17°37'16" | 36.00' | 11.07' | N14°03'35"E 11.03' |
| C28 | 23°08'19" | 145.00' | 58.56' | S11°18'03"W 58.16' |
| C29 | 24°48'28" | 205.00' | 88.76' | S12°08'07"W 88.07' |
| C30 | 27°59'58" | 42.00' | 20.52' | S38°32'20"W 20.32' |
| C31 | 20°50'59" | 15.00' | 5.46' | N42°06'50"E 5.43' |
| C32 | 9°23'19" | 200.00' | 32.77' | S36°22'59"W 32.74' |
| C34 | 31°09'28" | 200.00' | 108.76' | S47°16'04"W 107.43' |
| C35 | 21°46'10" | 200.00' | 75.99' | S51°57'44"W 75.53' |
| C36 | 90°00'00" | 13.00' | 20.42' | N17°50'48"E 18.38' |
| C37 | 90°00'00" | 13.00' | 20.42' | S44°43'53"W 18.38' |
| C37 | 90°00'00" | 13.00' | 20.42' | S72°09'12"E 18.38' |
| C38 | 26°53'05" | 175.00' | 82.11' | S13°42'39"E 81.36' |
| C40 | 10°34'57" | 225.00' | 41.56' | S21°51'43"E 41.50' |
| C41 | 26°53'05" | 225.00' | 105.58' | S13°42'39"E 104.61' |
| C42 | 15°29'53" | 225.00' | 60.86' | S08°49'19"E 60.67' |
| C43 | 0°48'16" | 225.00' | 3.16' | S00°40'14"E 3.16' |

## FL-1 PROFILE
## STA 0+00.00 TO 0+60.00




## FL-2 PROFILE
## STA 0+00.00 TO 0+60.00




Know what's below. Call before you dig.

## ENGINEER'S STATEMENT

PREPARED UNDER MY DIRECT SUPERVISION

COLORADO LICENSED ANDREW J. HUGILL PROFESSIONAL ENGINEER 57007

ANDREW J. HUGILL, PE
COLORADO LIC. PE NO. 57007
FOR AND ON BEHALF OF JR ENGINEERING, LLC.

DATE

UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, JR ENGINEERING APPROVES THEIR USE ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

PREPARED FOR
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10221 PRESTWICK TRAIL
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Fort Collins 970-491-9888 • www.jrengineering.com

| No. | REVISION | BY | DATE |
|---|---|---|---|
| | | | |

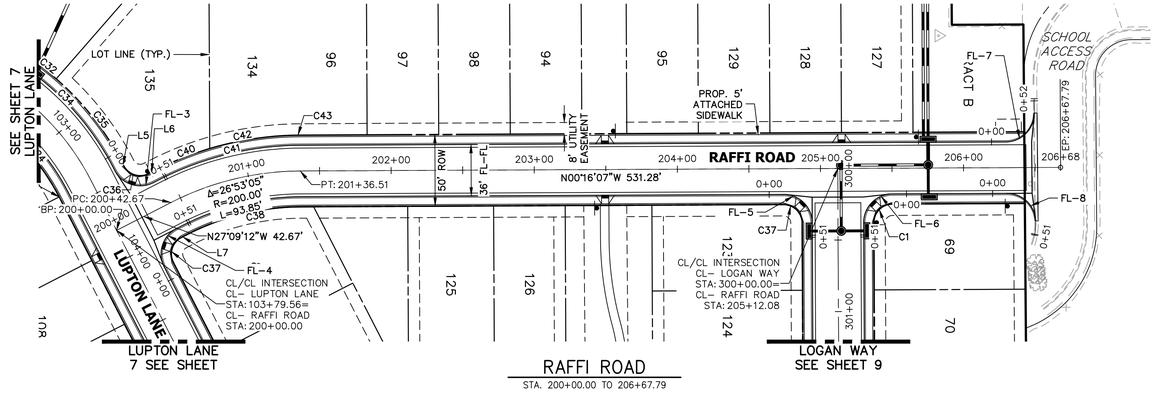
| | |
|---|---|
| H-SCALE | 1"=50' |
| V-SCALE | 1"=5' |
| DATE | 12/13/21 |
| DESIGNED BY | AJH |
| DRAWN BY | CRB |
| CHECKED BY | |

COYOTE CREEK FILING NO. 4

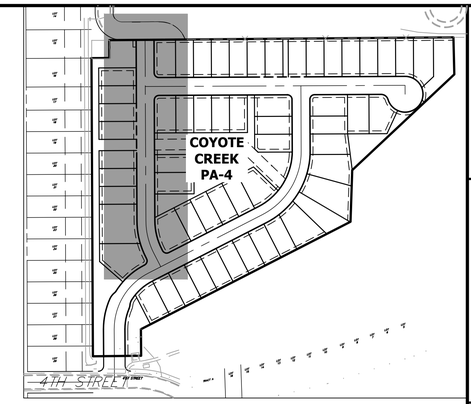
FINAL STREET PLAN AND PROFILE

SHEET 7 OF 46

JOB NO. 16093.00

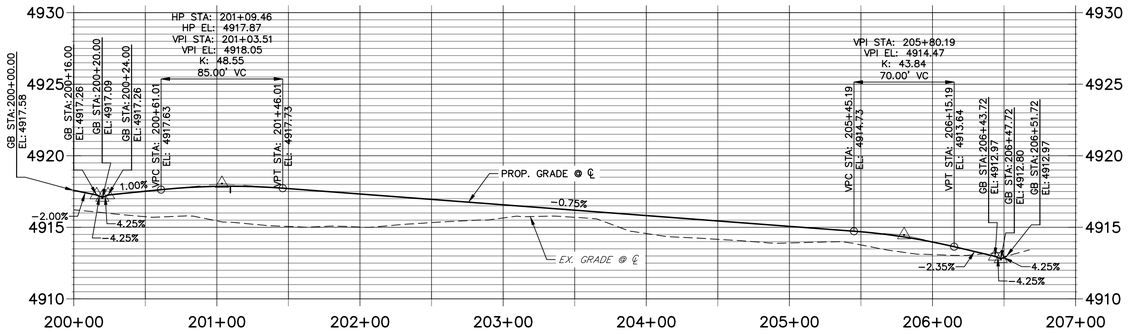



RAFFI ROAD
STA. 200+00.00 TO 206+67.79

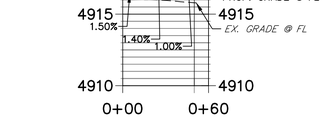



**KEY MAP**
N.T.S.

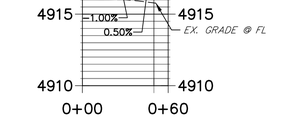
## CL- RAFFI ROAD PROFILE
## STA 200+00.00 TO 207+00.00



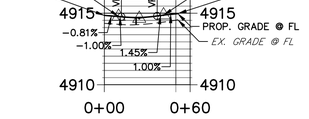

## FL-3 PROFILE
## STA 0+00.00 TO 0+60.00



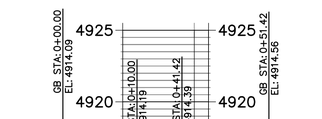

## FL-4 PROFILE
## STA 0+00.00 TO 0+60.00



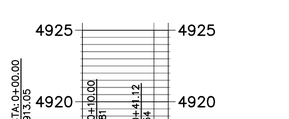

## FL-5 PROFILE
## STA 0+00.00 TO 0+60.00



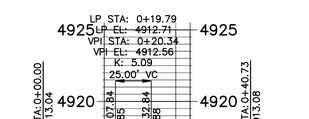

## FL-6 PROFILE
## STA 0+00.00 TO 0+60.00




## FL-7 PROFILE
## STA 0+00.00 TO 0+60.00




## FL-8 PROFILE
## STA 0+00.00 TO 0+60.00




| LINE TABLE | | |
|---|---|---|
| LINE | BEARING | DISTANCE |
| L1 | S43°09'42"E | 9.51' |
| L2 | N62°50'48"E | 1.17' |
| L3 | S62°50'48"W | 8.14' |
| L4 | S62°52'38"W | 0.16' |
| L5 | N62°50'48"E | 1.29' |
| L6 | N27°09'12"W | 4.67' |
| L7 | N27°09'12"W | 4.67' |
| L9 | N45°59'10"W | 13.12' |

| CURVE TABLE | | | | |
|---|---|---|---|---|
| CURVE | DELTA | RADIUS | LENGTH | CHORD |
| C1 | 90°00'00" | 13.00' | 20.42' | S45°16'07"E 18.38' |
| C2 | 28°31'44" | 50.00' | 24.90' | N76°00'15"W 24.64' |
| C3 | 40°06'33" | 50.00' | 35.00' | N41°41'07"W 34.29' |
| C4 | 40°06'33" | 50.00' | 35.00' | N01°34'34"W 34.29' |
| C5 | 253°23'54" | 50.00' | 221.13' | N36°25'51"E 80.18' |
| C8 | 73°23'54" | 20.00' | 25.62' | N53°34'09"W 23.90' |
| C9 | 90°00'00" | 13.00' | 20.42' | S44°43'53"W 18.38' |
| C10 | 90°00'00" | 13.00' | 20.42' | N45°16'07"W 18.38' |
| C11 | 1°10'19" | 175.00' | 3.58' | N00°19'03"E 3.58' |
| C12 | 2°46'17" | 225.00' | 10.88' | N01°07'02"E 10.88' |
| C13 | 13°56'57" | 225.00' | 54.78' | N09°28'39"E 54.64' |
| C14 | 38°23'55" | 175.00' | 117.28' | N20°06'10"E 115.10' |
| C15 | 63°06'55" | 175.00' | 192.77' | N31°17'21"E 183.17' |
| C17 | 63°06'55" | 225.00' | 247.85' | N31°17'21"E 235.51' |
| C18 | 13°58'29" | 225.00' | 54.88' | N23°26'23"E 54.74' |
| C19 | 8°00'31" | 225.00' | 31.45' | N34°25'53"E 31.42' |
| C20 | 13°41'21" | 225.00' | 53.76' | N45°16'49"E 53.63' |
| C21 | 23°32'40" | 175.00' | 71.91' | N51°04'28"E 71.41' |
| C22 | 10°43'19" | 225.00' | 42.10' | N57°29'09"E 42.04' |
| C23 | 23°30'43" | 150.00' | 61.55' | S51°05'27"W 61.12' |

| CURVE TABLE | | | | |
|---|---|---|---|---|
| CURVE | DELTA | RADIUS | LENGTH | CHORD |
| C24 | 29°55'48" | 150.00' | 78.36' | S47°52'54"W 77.47' |
| C25 | 6°25'05" | 150.00' | 16.80' | S36°07'33"W 16.79' |
| C26 | 27°40'04" | 32.00' | 15.45' | S19°04'59"W 15.30' |
| C27 | 17°37'16" | 36.00' | 11.07' | N14°03'35"E 11.03' |
| C28 | 23°08'19" | 145.00' | 58.56' | S11°18'03"W 58.16' |
| C29 | 24°48'28" | 205.00' | 88.76' | S12°08'07"W 88.07' |
| C30 | 27°59'58" | 42.00' | 20.52' | S38°32'20"W 20.32' |
| C31 | 20°50'59" | 15.00' | 5.46' | N42°06'50"E 5.43' |
| C32 | 9°23'19" | 200.00' | 32.77' | S36°22'59"W 32.74' |
| C34 | 31°09'28" | 200.00' | 108.76' | S47°16'04"W 107.43' |
| C35 | 21°46'10" | 200.00' | 75.99' | S51°57'44"W 75.53' |
| C36 | 90°00'00" | 13.00' | 20.42' | N17°50'48"E 18.38' |
| C37 | 90°00'00" | 13.00' | 20.42' | S44°43'53"W 18.38' |
| C37 | 90°00'00" | 13.00' | 20.42' | S72°09'12"E 18.38' |
| C38 | 26°53'05" | 175.00' | 82.11' | S13°42'39"E 81.36' |
| C40 | 10°34'57" | 225.00' | 41.56' | S21°51'43"E 41.50' |
| C41 | 26°53'05" | 225.00' | 105.58' | S13°42'39"E 104.61' |
| C42 | 15°29'53" | 225.00' | 60.86' | S08°49'19"E 60.67' |
| C43 | 0°48'16" | 225.00' | 3.16' | S00°40'14"E 3.16' |

Know what's below. Call before you dig.

50 25 0 50 100
HORIZONTAL
ORIGINAL SCALE: 1" = 50'
VERTICAL
ORIGINAL SCALE: 1" = 5'

**ENGINEER'S STATEMENT**

PREPARED UNDER MY DIRECT SUPERVISION

COLORADO REGISTERED ANDREW J. HUGILL 57007 PROFESSIONAL ENGINEER

ANDREW J. HUGILL, PE DATE
COLORADO LIC. PE NO. 57007
FOR AND ON BEHALF OF JR ENGINEERING, LLC.

UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, JR ENGINEERING APPROVES THEIR USE ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

PREPARED FOR
LUPTON LAND, LLC
10221 PRESTWICK TRAIL
LONE TREE, CO 80124
BOB QUINETTE
P-303.587.1966

J·R ENGINEERING
A Westrian Company
Centennial 303-740-9393 • Colorado Springs 719-593-2593
Fort Collins 970-491-9888 • www.jrengineering.com

| No. | REVISION | BY | DATE |
|---|---|---|---|
| | | | |

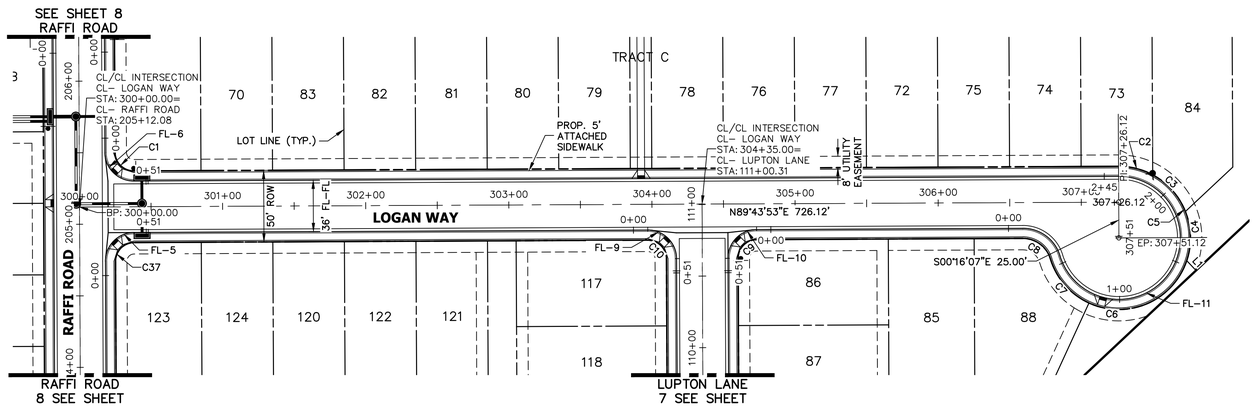
| | |
|---|---|
| H-SCALE | 1"=50' |
| V-SCALE | 1"=5' |
| DATE | 12/13/21 |
| DESIGNED BY | AJH |
| DRAWN BY | CRB |
| CHECKED BY | |

COYOTE CREEK FILING NO. 4

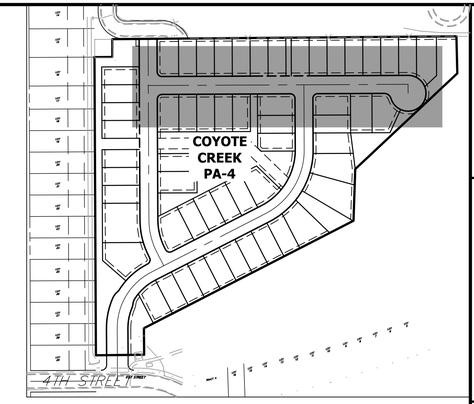
FINAL STREET PLAN AND PROFILE

SHEET 8 OF 46

JOB NO. 16093.00

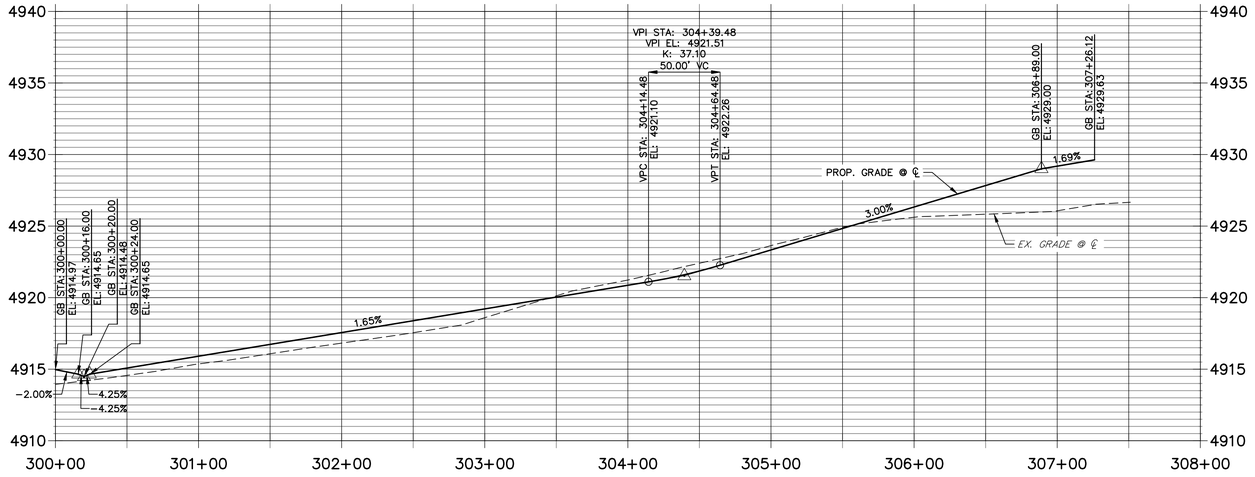



LOGAN WAY
STA. 300+00.00 TO 307+51.12

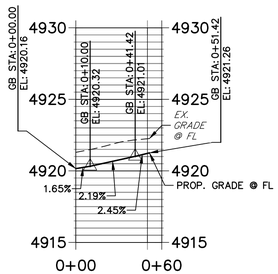



**KEY MAP**
N.T.S.

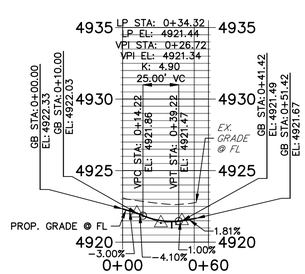
## CL- LOGAN WAY PROFILE
## STA 300+00.00 TO 308+00.00



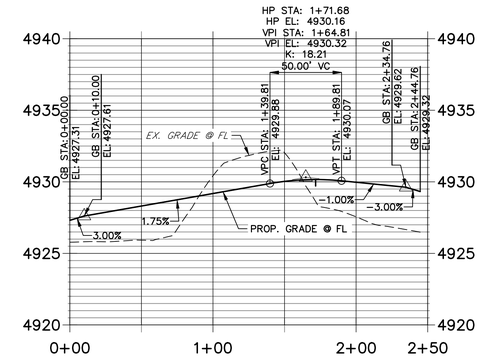

## FL-9 PROFILE
## STA 0+00.00 TO 0+60.00




## FL-10 PROFILE
## STA 0+00.00 TO 0+60.00




## FL-11 PROFILE
## STA 0+00.00 TO 2+50.00




| LINE TABLE | | |
|---|---|---|
| LINE | BEARING | DISTANCE |
| L1 | S43°09'42"E | 9.51' |
| L2 | N62°50'48"E | 1.17' |
| L3 | S62°50'48"W | 8.14' |
| L4 | S62°52'38"W | 0.16' |
| L5 | N62°50'48"E | 1.29' |
| L6 | N27°09'12"W | 4.67' |
| L7 | N27°09'12"W | 4.67' |
| L9 | N45°59'10"W | 13.12' |

| CURVE TABLE | | | | |
|---|---|---|---|---|
| CURVE | DELTA | RADIUS | LENGTH | CHORD |
| C1 | 90°00'00" | 13.00' | 20.42' | S45°16'07"E 18.38' |
| C2 | 28°31'44" | 50.00' | 24.90' | N76°00'15"W 24.64' |
| C3 | 40°06'33" | 50.00' | 35.00' | N41°41'07"W 34.29' |
| C4 | 40°06'33" | 50.00' | 35.00' | N01°34'34"W 34.29' |
| C5 | 253°23'54" | 50.00' | 221.13' | N36°25'51"E 80.18' |
| C8 | 73°23'54" | 20.00' | 25.62' | N53°34'09"W 23.90' |
| C9 | 90°00'00" | 13.00' | 20.42' | S44°43'53"W 18.38' |
| C10 | 90°00'00" | 13.00' | 20.42' | N45°16'07"W 18.38' |
| C11 | 1°10'19" | 175.00' | 3.58' | N00°19'03"E 3.58' |
| C12 | 2°46'17" | 225.00' | 10.88' | N01°07'02"E 10.88' |
| C13 | 13°56'57" | 225.00' | 54.78' | N09°28'39"E 54.64' |
| C14 | 38°23'55" | 175.00' | 117.28' | N20°06'10"E 115.10' |
| C15 | 63°06'55" | 175.00' | 192.77' | N31°17'21"E 183.17' |
| C17 | 63°06'55" | 225.00' | 247.85' | N31°17'21"E 235.51' |
| C18 | 13°58'29" | 225.00' | 54.88' | N23°26'23"E 54.74' |
| C19 | 8°00'31" | 225.00' | 31.45' | N34°25'53"E 31.42' |
| C20 | 13°41'21" | 225.00' | 53.76' | N45°16'49"E 53.63' |
| C21 | 23°32'40" | 175.00' | 71.91' | N51°04'28"E 71.41' |
| C22 | 10°43'19" | 225.00' | 42.10' | N57°29'09"E 42.04' |
| C23 | 23°30'43" | 150.00' | 61.55' | S51°05'27"W 61.12' |

| CURVE TABLE | | | | |
|---|---|---|---|---|
| CURVE | DELTA | RADIUS | LENGTH | CHORD |
| C24 | 29°55'48" | 150.00' | 78.36' | S47°52'54"W 77.47' |
| C25 | 6°25'05" | 150.00' | 16.80' | S36°07'33"W 16.79' |
| C26 | 27°40'04" | 32.00' | 15.45' | S19°04'59"W 15.30' |
| C27 | 17°37'16" | 36.00' | 11.07' | N14°03'35"E 11.03' |
| C28 | 23°08'19" | 145.00' | 58.56' | S11°18'03"W 58.16' |
| C29 | 24°48'28" | 205.00' | 88.76' | S12°08'07"W 88.07' |
| C30 | 27°59'58" | 42.00' | 20.52' | S38°32'20"W 20.32' |
| C31 | 20°50'59" | 15.00' | 5.46' | N42°06'50"E 5.43' |
| C32 | 9°23'19" | 200.00' | 32.77' | S36°22'59"W 32.74' |
| C34 | 31°09'28" | 200.00' | 108.76' | S47°16'04"W 107.43' |
| C35 | 21°46'10" | 200.00' | 75.99' | S51°57'44"W 75.53' |
| C36 | 90°00'00" | 13.00' | 20.42' | N17°50'48"E 18.38' |
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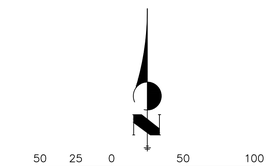



HORIZONTAL
ORIGINAL SCALE: 1" = 50'
VERTICAL
ORIGINAL SCALE: 1" = 5'

811
Know what's **below.**
**Call** before you dig.

## ENGINEER'S STATEMENT

PREPARED UNDER MY DIRECT SUPERVISION

ANDREW J. HUGILL, PE
COLORADO LIC. PE NO. 57007
FOR AND ON BEHALF OF JR ENGINEERING, LLC.

DATE

COLORADO REGISTERED ANDREW J. HUGILL 57007 PROFESSIONAL ENGINEER

UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, JR ENGINEERING APPROVES THEIR USE ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

PREPARED FOR
LUPTON LAND, LLC
10221 PRESTWICK TRAIL
LONE TREE, CO 80124
BOB QUINETTE
P-303.587.1966

J·R ENGINEERING
A Westrian Company
Centennial 303-740-9393 • Colorado Springs 719-593-2593
Fort Collins 970-491-9888 • www.jrengineering.com

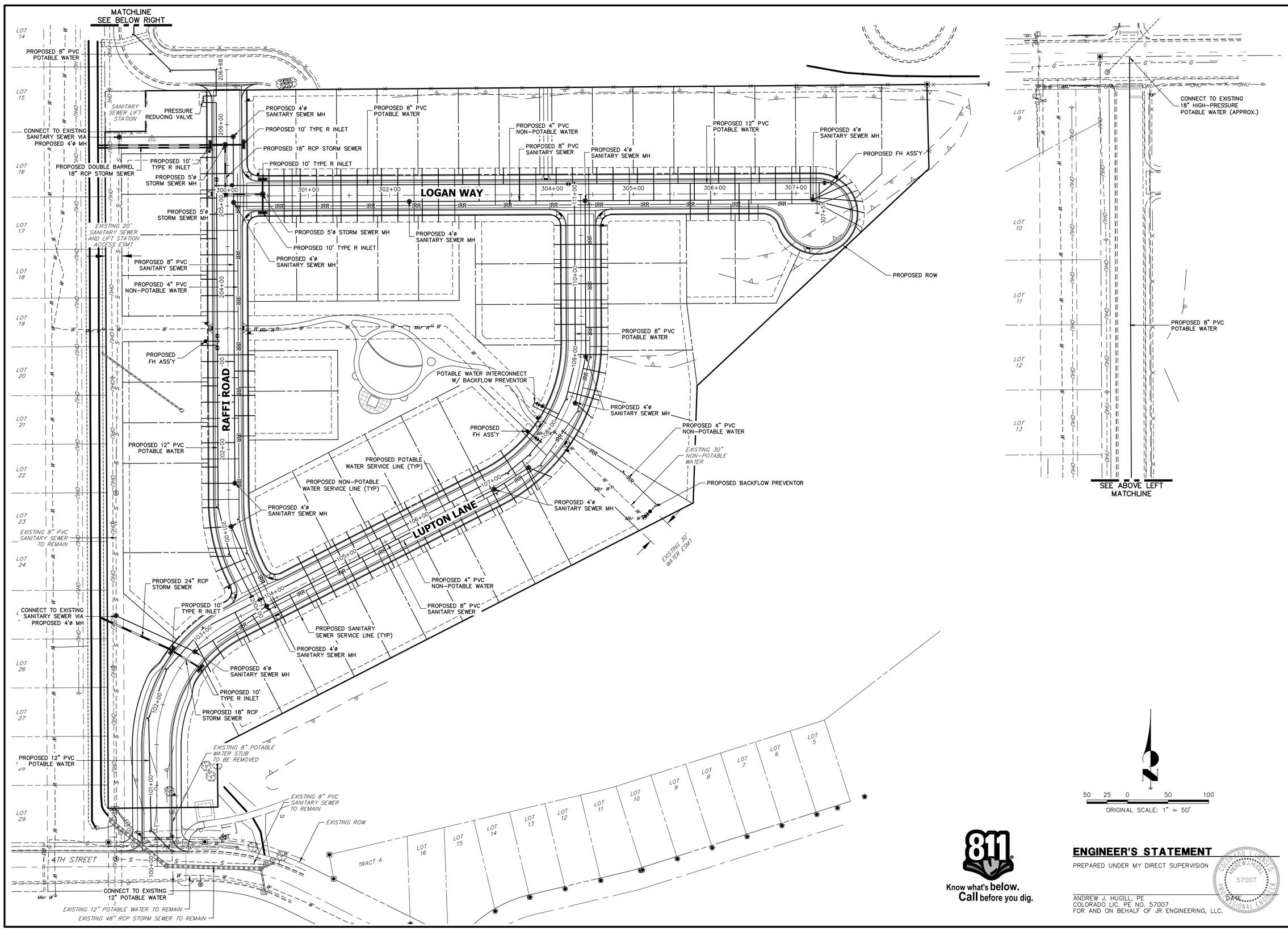
| No. | REVISION | BY | DATE |
|---|---|---|---|
| | | | |

H-SCALE 1"=50'
V-SCALE 1"=5'
DATE 12/13/21
DESIGNED BY AJH
DRAWN BY CRB
CHECKED BY

COYOTE CREEK FILING NO. 4

FINAL STREET PLAN AND PROFILE

SHEET 9 OF 46
JOB NO. 16093.00




UNTIL SUCH TIME AS THESE PLANS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, JR ENGINEERING APPROVES THEIR USE ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

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|---|---|---|---|
| | | | |

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|---|---|
| H-SCALE | 1"=50' |
| V-SCALE | N/A |
| DATE | 12/13/21 |
| DESIGNED BY | SWW |
| DRAWN BY | SWW |
| CHECKED BY | |

50 25 0 50 100
ORIGINAL SCALE: 1" = 50'

811 Know what's below. Call before you dig.

## ENGINEER'S STATEMENT

PREPARED UNDER MY DIRECT SUPERVISION

ANDREW J. HUGILL, PE
COLORADO LIC. PE NO. 57007
FOR AND ON BEHALF OF JR ENGINEERING, LLC.

COLORADO LICENSED ANDREW J. HUGILL 57007 PROFESSIONAL ENGINEER

DATE

# COYOTE CREEK FILING NO. 4

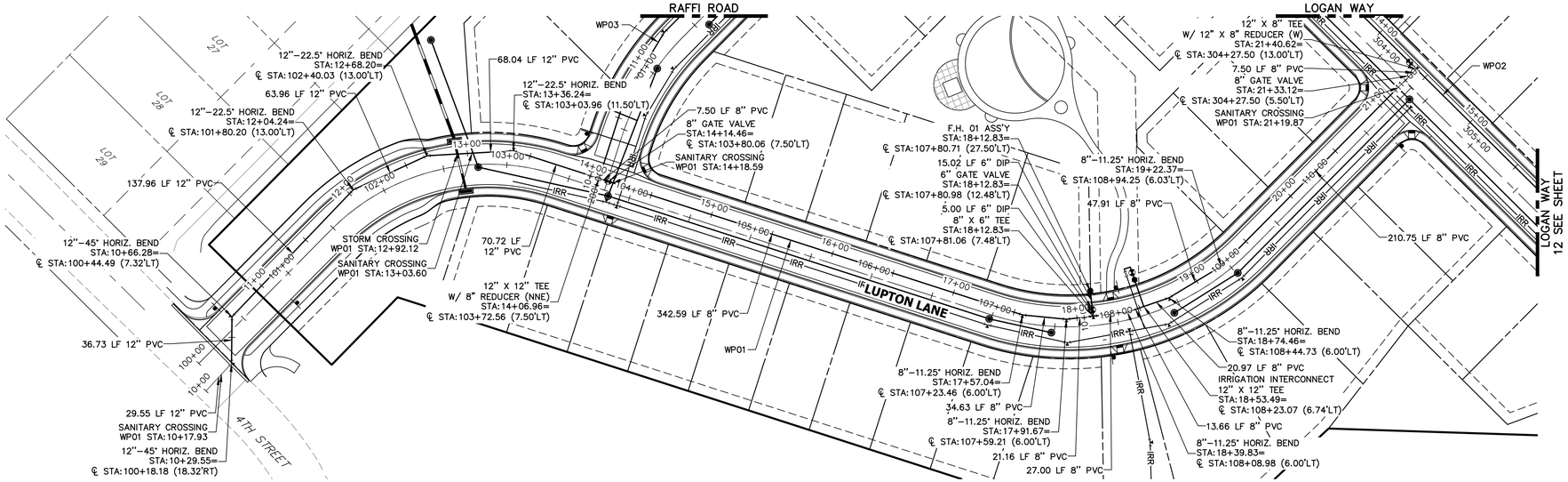
## FINAL UTILITY PLAN

SHEET 10 OF 46

JOB NO. 16093.00

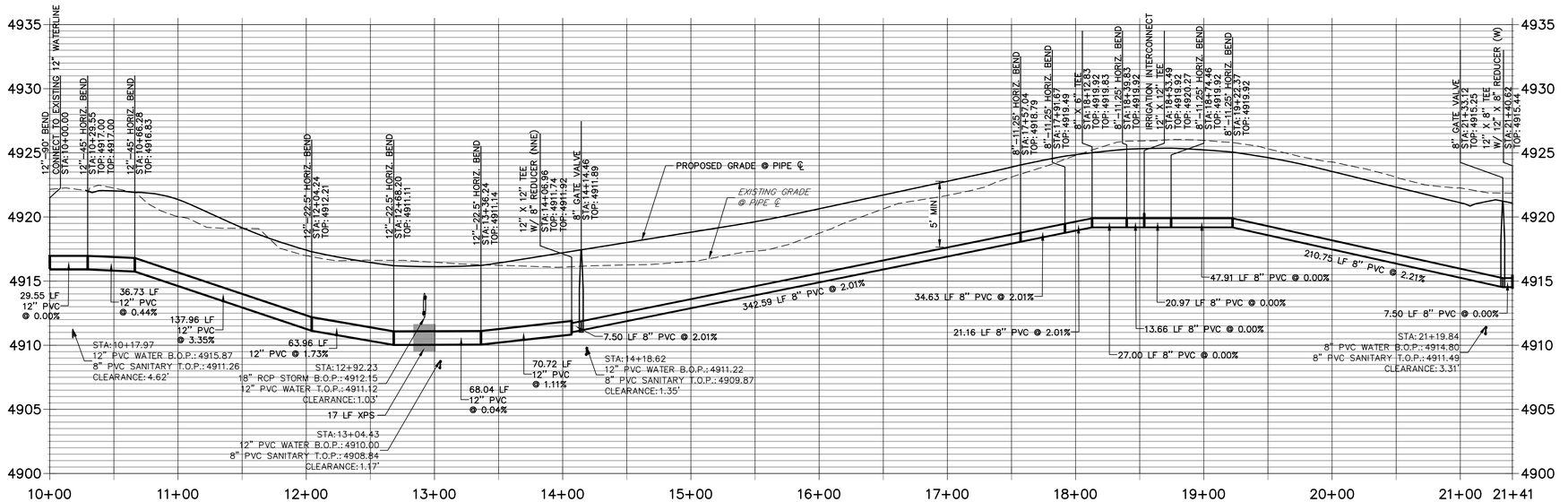
## NOTES:

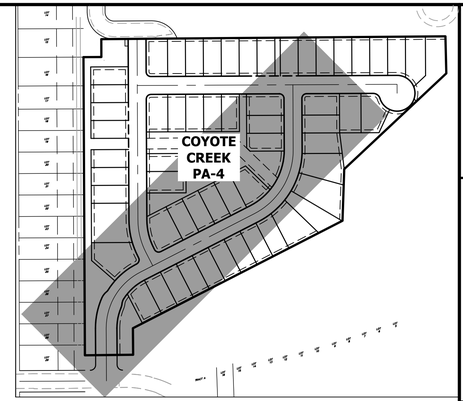
1. ALL STATIONING IS PIPE CENTERLINE EQUATED TO ROADWAY CENTERLINE, UNLESS OTHERWISE NOTED.

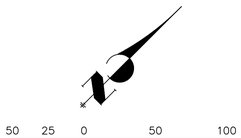



LUPTON LANE
STA. 100+00.00 TO 111+00.31

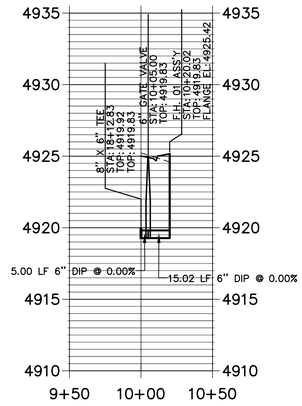
## WP01 PROFILE
## STA 10+00.00 TO 21+40.62




## FH01 PROFILE
## STA 9+50.00 TO 10+50.00




Know what's below.
Call before you dig.

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PREPARED UNDER MY DIRECT SUPERVISION

COLORADO LICENSED
ANDREW J. HUGILL
57007
PROFESSIONAL ENGINEER

ANDREW J. HUGILL, PE
COLORADO LIC. PE NO. 57007
FOR AND ON BEHALF OF JR ENGINEERING, LLC.

DATE

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| No. | REVISION | BY | DATE |
|---|---|---|---|
| | | | |

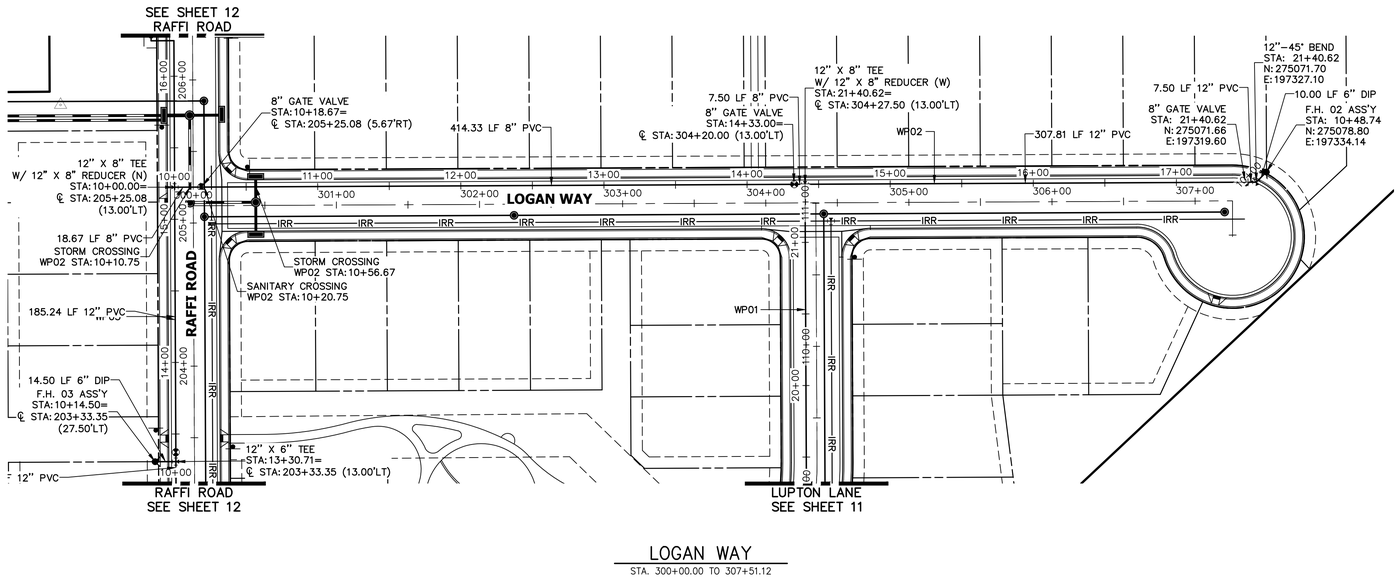
| | | | |
|---|---|---|---|
| H-SCALE | 1"=50' | DESIGNED BY | SWW |
| V-SCALE | 1"=5' | DRAWN BY | SWW |
| DATE | 12/13/21 | CHECKED BY | |

COYOTE CREEK FILING NO 4

WATER PLAN & PROFILE

SHEET 11 OF 46

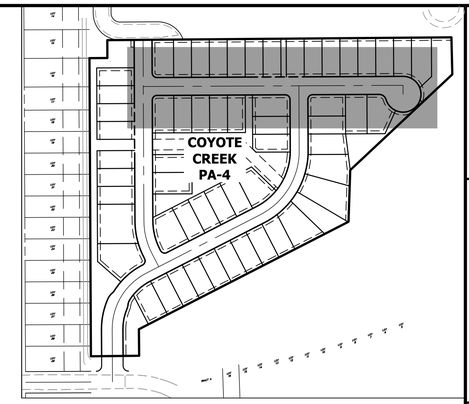
JOB NO. 16093.00




LOGAN WAY
STA. 300+00.00 TO 307+51.12

## NOTES:

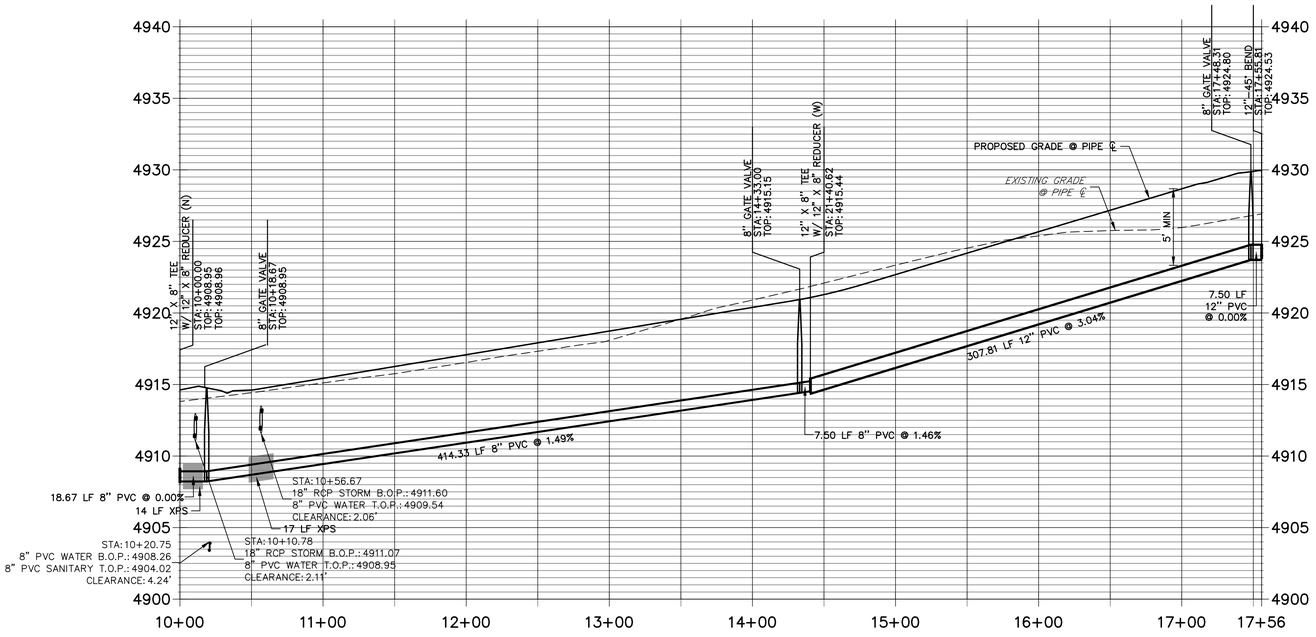
1. ALL STATIONING IS PIPE CENTERLINE EQUATED TO ROADWAY CENTERLINE, UNLESS OTHERWISE NOTED.



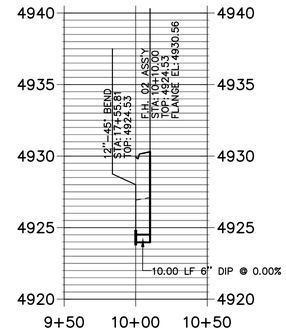

50 25 0 50 100

HORIZONTAL
ORIGINAL SCALE: 1" = 50'
VERTICAL
ORIGINAL SCALE: 1" = 5'

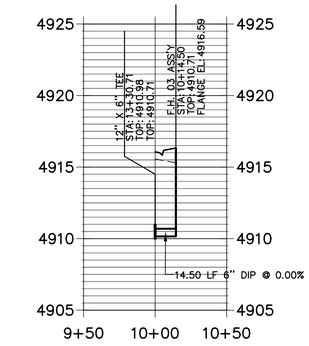
## WP02 PROFILE
## STA 10+00.00 TO 17+55.81




## FH02 PROFILE
## STA 9+50.00 TO 10+50.00




## FH03 PROFILE
## STA 9+50.00 TO 10+50.00

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ANDREW J. HUGILL, PE
COLORADO LIC. PE NO. 57007
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|---|---|
| H-SCALE | 1"=50' |
| V-SCALE | 1"=5' |
| DATE | 12/13/21 |
| DESIGNED BY | SWW |
| DRAWN BY | SWW |
| CHECKED BY | |

COYOTE CREEK FILING NO 4

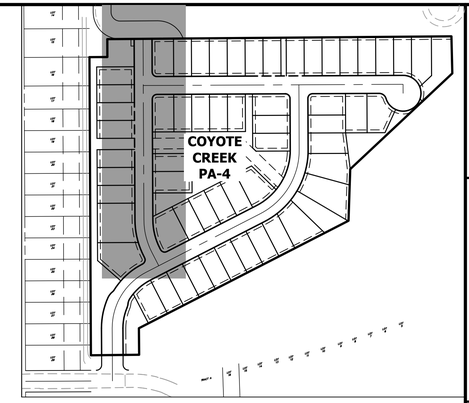
WATER PLAN & PROFILE

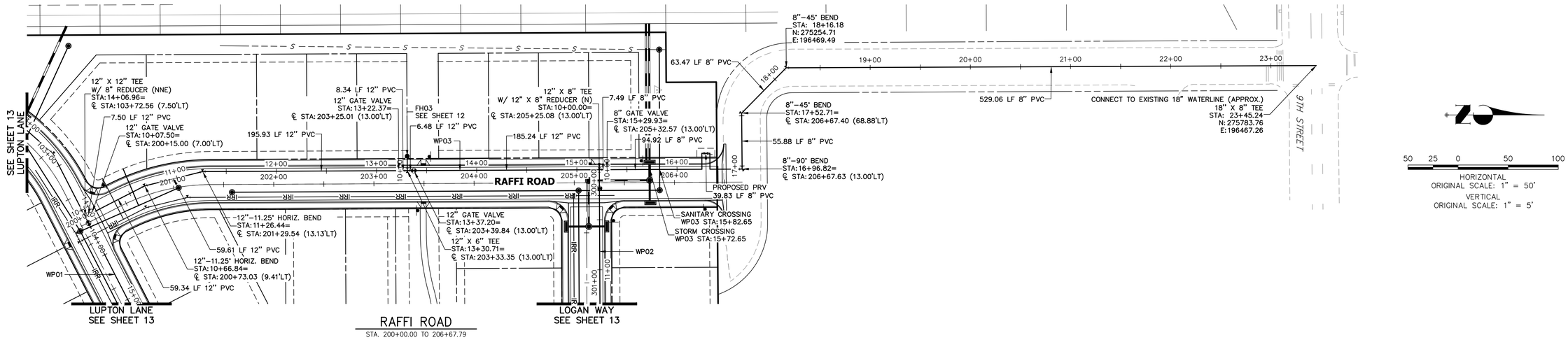
SHEET 12 OF 46

JOB NO. 16093.00

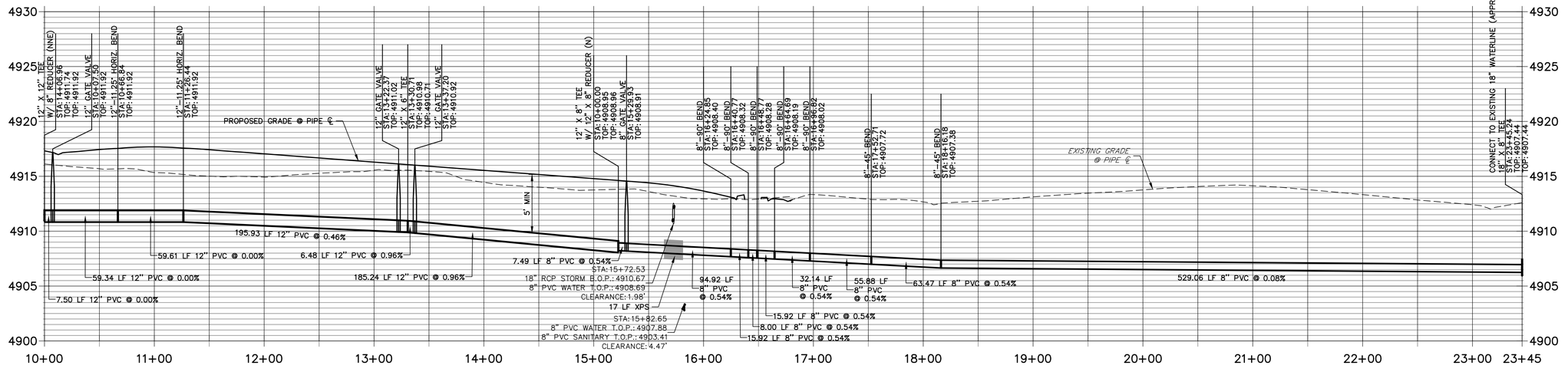
## NOTES:

1. ALL STATIONING IS PIPE CENTERLINE EQUATED TO ROADWAY CENTERLINE, UNLESS OTHERWISE NOTED.




## WP03 PROFILE
## STA 10+00.00 TO 23+45.24

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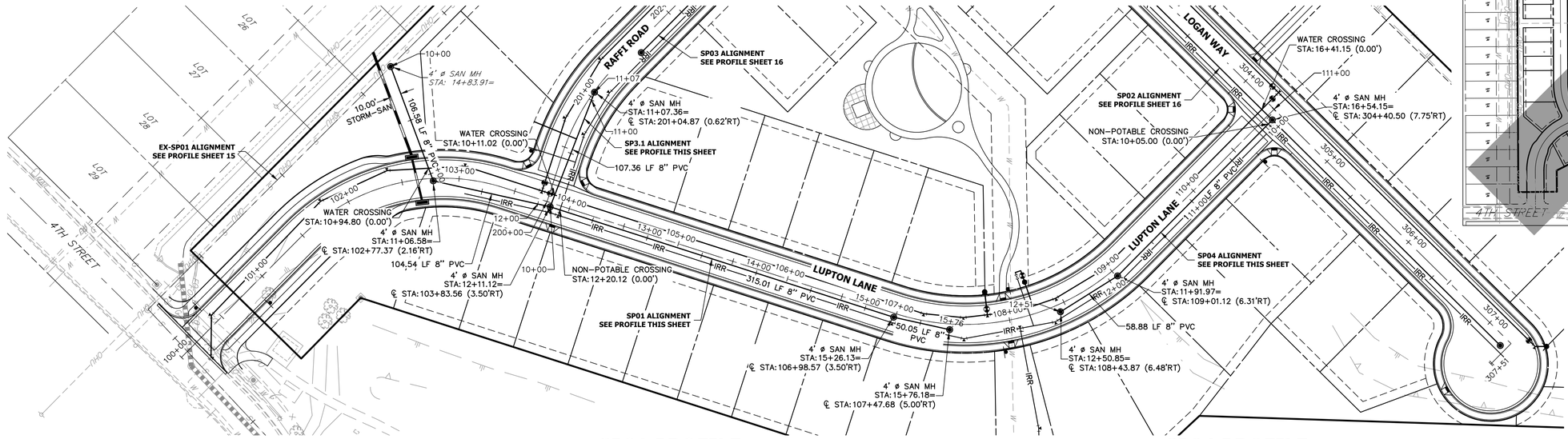
| DATE | 12/13/21 |
| DESIGNED BY | SWW |
| DRAWN BY | SWW |
| CHECKED BY | |

COYOTE CREEK FILING NO 4

WATER PLAN & PROFILE

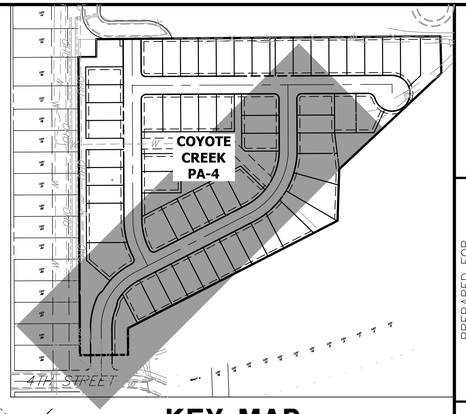
SHEET 13 OF 46

JOB NO. 16093.00




## SP01 PROFILE
## STA 10+00.00 TO 15+76.18

## SP04 PROFILE
## STA 10+00.00 TO 12+50.85

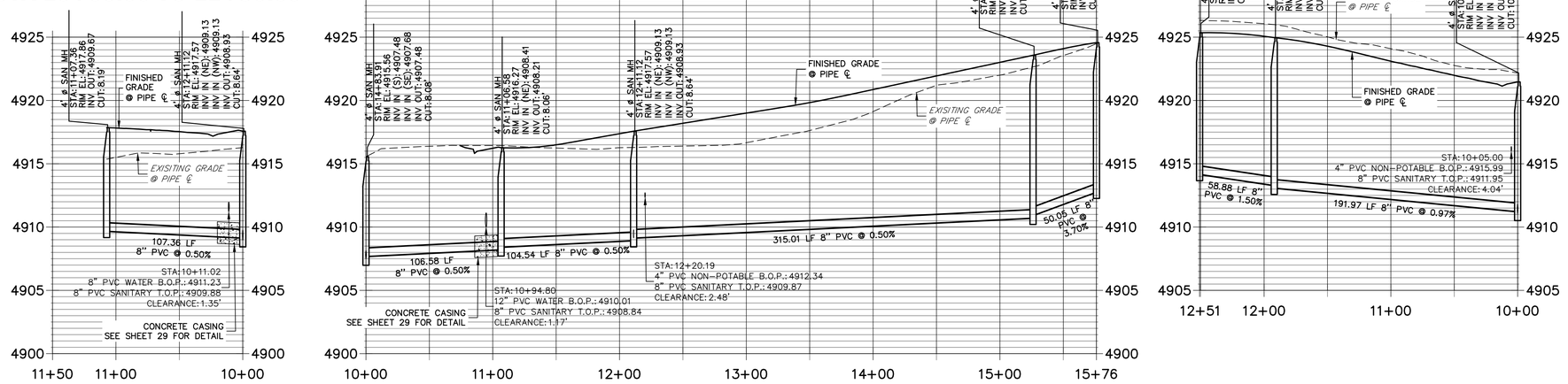



## KEY MAP
N.T.S.

50 25 0 50 100

HORIZONTAL
ORIGINAL SCALE: 1" = 50'
VERTICAL
ORIGINAL SCALE: 1" = 5'

## SP3.1 PROFILE
## STA 10+00.00 TO 11+50.00




Know what's **below.**
**Call** before you dig.

### BASIS OF BEARING:
THE WEST LINE OF THE NORTHEAST QUARTER OF SECTION 5, TOWNSHIP 1 NORTH, RANGE 66 WEST OF THE 6TH PRINCIPAL MERIDIAN, BEING MONUMENTED AT THE NORTH END BY A 3-1/4" ALUMINUM CAP STAMPED "1/4 2003 PLS 14823" IN A RANGE BOX AND AT THE SOUTH END BY A #6 REBAR WITH 3-1/4" ALUMINUM CAP STAMP ILLEGIBLE OFF TO THE SIDE IN A RANGE BOX, BEARING N00°16'07"W AS REFERENCED TO COLORADO STATE PLANE NORTH ZONE.

### BENCHMARK:
WELD COUNTY BENCHMARK 4907, 3-3/4" PIPE CAP ON PIPE APPROXIMATELY 90 FEET WEST OF THE WESTERLY MOST RAILROAD TRACK AND 26 FEET SOUTH OF THE CENTERLINE OF 9TH STREET, ELEVATION=4908.22 (NAVD88)

### ENGINEER'S STATEMENT
PREPARED UNDER MY DIRECT SUPERVISION

ANDREW J. HUGILL, PE
COLORADO LIC. PE NO. 57007
FOR AND ON BEHALF OF JR ENGINEERING, LLC.

DATE

COLORADO REGISTERED ANDREW J. HUGILL 57007 PROFESSIONAL ENGINEER

UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, JR ENGINEERING APPROVES THEIR USE ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

PREPARED FOR
LUPTON LAND, LLC
10221 PRESTWICK TRAIL
LONE TREE, CO 80124
BOB QUINETTE
P-303.587.1966

J·R ENGINEERING
A Westrian Company
Centennial 303-740-9393 • Colorado Springs 719-593-2593
Fort Collins 970-491-9888 • www.jrengineering.com

| No. | REVISION | BY | DATE |
|---|---|---|---|
| | | | |

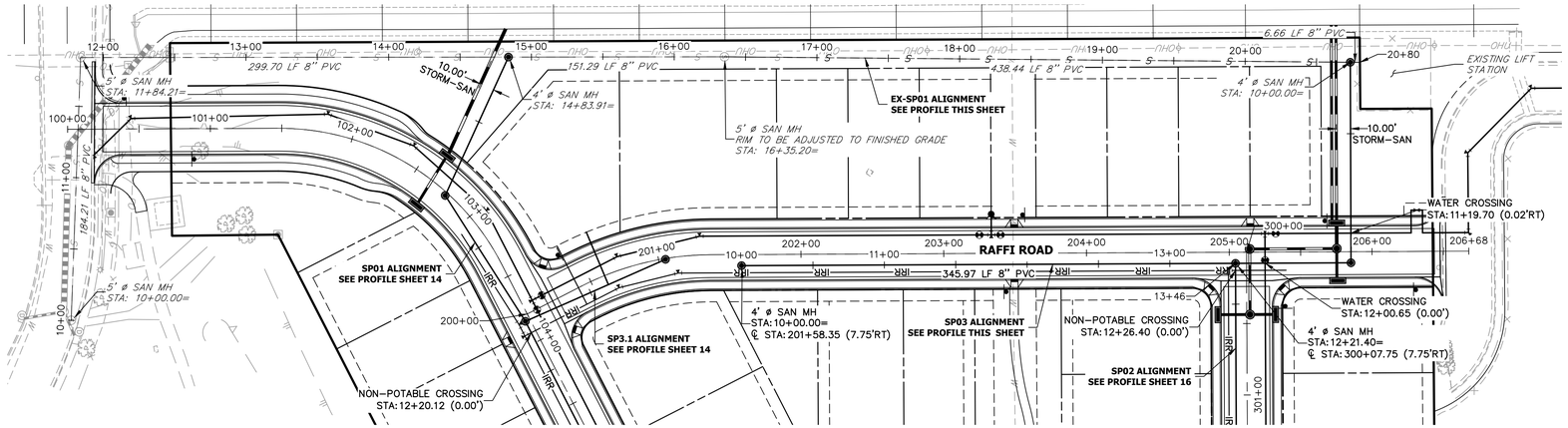
| | |
|---|---|
| H-SCALE | 1"=50' |
| V-SCALE | 1"=5' |
| DATE | 12/13/21 |
| DESIGNED BY | AHC |
| DRAWN BY | AHC |
| CHECKED BY | |

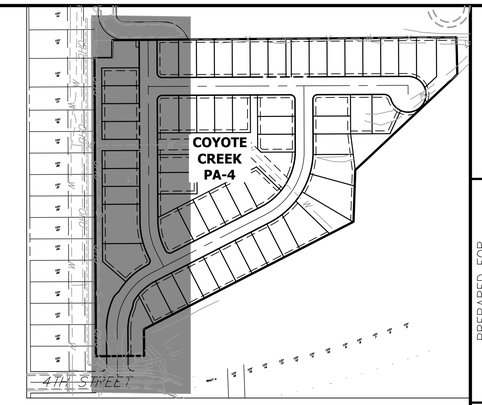
COYOTE CREEK FILING NO 4

SANITARY SEWER PLAN & PROFILE

SHEET 14 OF 46

JOB NO. 16093.00




## KEY MAP
N.T.S.

50 25 0 50 100
HORIZONTAL ORIGINAL SCALE: 1" = 50'
VERTICAL ORIGINAL SCALE: 1" = 5'

## EX-SP01 PROFILE
## STA 13+50.00 TO 20+80.31




## SP03 PROFILE
## STA 10+00.00 TO 13+45.97




811 Know what's below. Call before you dig.

## BASIS OF BEARING:
THE WEST LINE OF THE NORTHEAST QUARTER OF SECTION 5, TOWNSHIP 1 NORTH, RANGE 66 WEST OF THE 6TH PRINCIPAL MERIDIAN, BEING MONUMENTED AT THE NORTH END BY A 3-1/4" ALUMINUM CAP STAMPED "1/4 2003 PLS 14823" IN A RANGE BOX AND AT THE SOUTH END BY A #6 REBAR WITH 3-1/4" ALUMINUM CAP STAMP ILLEGIBLE OFF TO THE SIDE IN A RANGE BOX, BEARING N00°16'07"W AS REFERENCED TO COLORADO STATE PLANE NORTH ZONE.

## BENCHMARK:
WELD COUNTY BENCHMARK 4907, 3-3/4" PIPE CAP ON PIPE APPROXIMATELY 90 FEET WEST OF THE WESTERLY MOST RAILROAD TRACK AND 26 FEET SOUTH OF THE CENTERLINE OF 9TH STREET, ELEVATION=4908.22 (NAVD88)

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DATE

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PREPARED FOR
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10221 PRESTWICK TRAIL
LONE TREE, CO 80124
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P-303.587.1966

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A Westrian Company
Centennial 303-740-9393 • Colorado Springs 719-593-2593
Fort Collins 970-491-9888 • www.jrengineering.com

| No. | REVISION | BY | DATE |
|---|---|---|---|
| | | | |

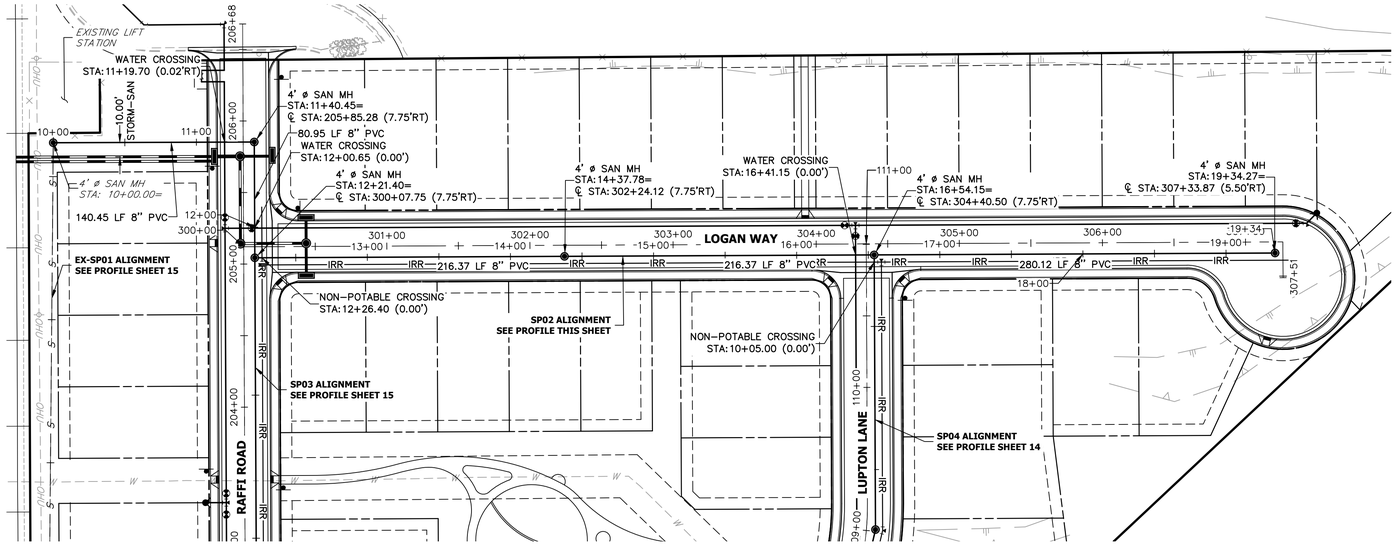
| | |
|---|---|
| H-SCALE | 1"=50' |
| V-SCALE | 1"=5' |
| DATE | 12/13/21 |
| DESIGNED BY | AHC |
| DRAWN BY | AHC |
| CHECKED BY | |

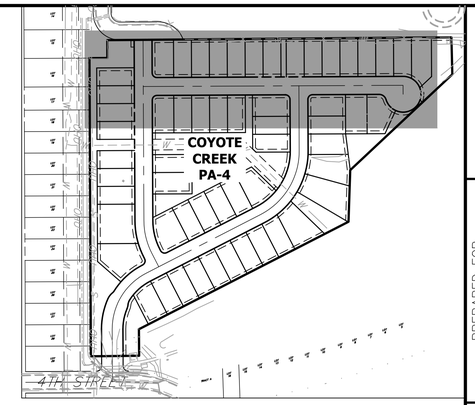
COYOTE CREEK FILING NO 4

SANITARY SEWER PLAN & PROFILE

SHEET 15 OF 46

JOB NO. 16093.00



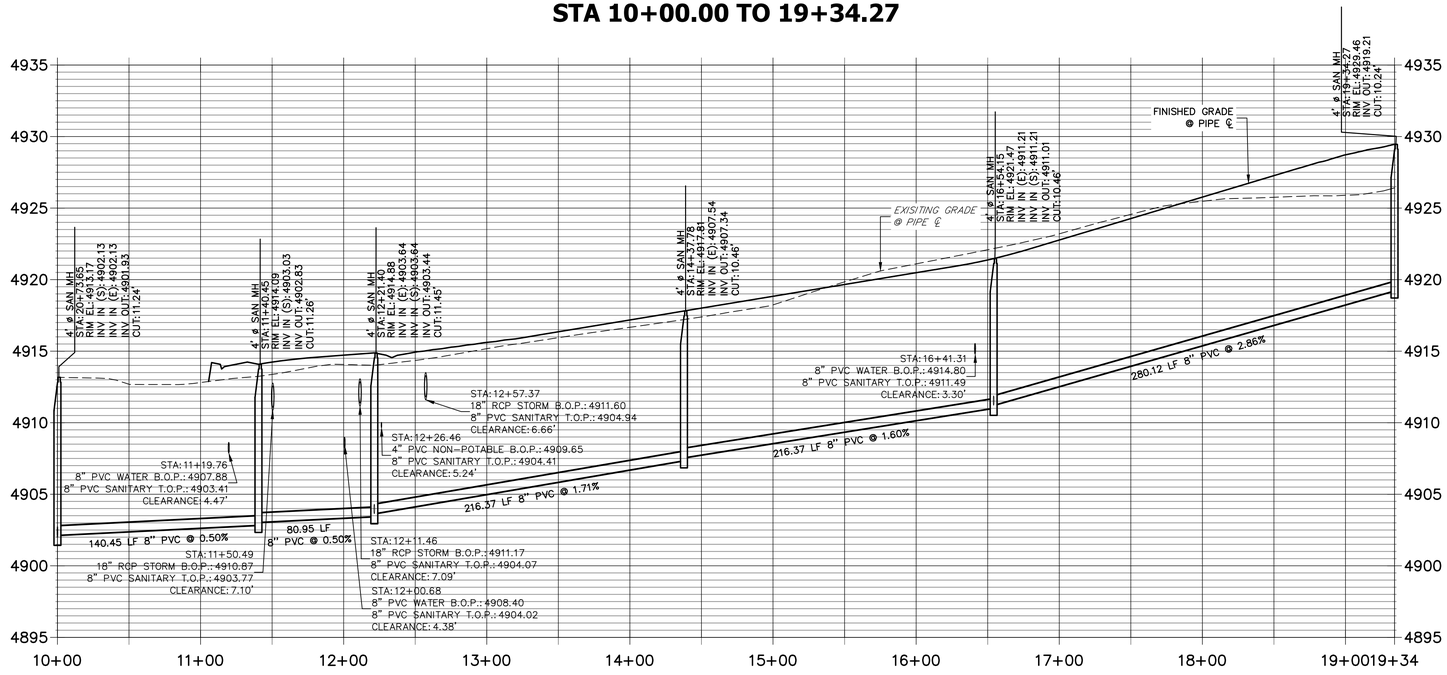

## KEY MAP

N.T.S.

50 25 0 50 100

HORIZONTAL
ORIGINAL SCALE: 1" = 50'
VERTICAL
ORIGINAL SCALE: 1" = 5'

## SP02 PROFILE
## STA 10+00.00 TO 19+34.27




Know what's **below.** **Call** before you dig.

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DATE

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P-303.587.1966

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| No. | REVISION | BY | DATE |
|---|---|---|---|
| | | | |

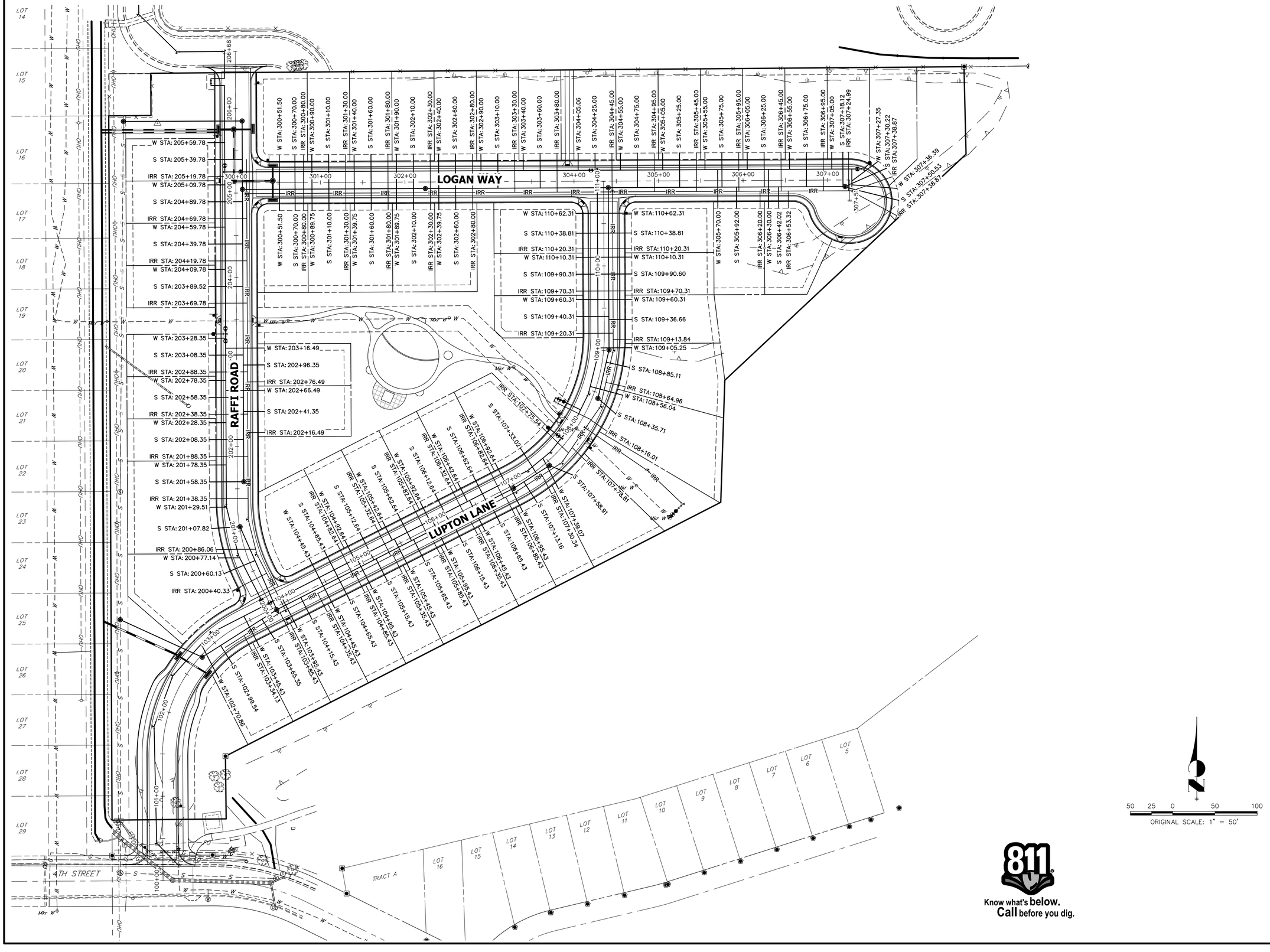
| | |
|---|---|
| H-SCALE | 1"=50' |
| V-SCALE | 1"=5' |
| DATE | 12/13/21 |
| DESIGNED BY | AHC |
| DRAWN BY | AHC |
| CHECKED BY | |

COYOTE CREEK FILING NO 4

SANITARY SEWER PLAN & PROFILE

SHEET 16 OF 46

JOB NO. 16093.00




50 25 0 50 100

ORIGINAL SCALE: 1" = 50'

811 Know what's below. Call before you dig.

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PREPARED FOR
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303-587-1966

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| No. | REVISION | BY | DATE |
|---|---|---|---|
| | | | |

| | |
|---|---|
| H-SCALE | 1"=50' |
| V-SCALE | N/A |
| DATE | 12/13/21 |
| DESIGNED BY | AJH |
| DRAWN BY | SWW |
| CHECKED BY | |

COYOTE CREEK FILING NO. 4

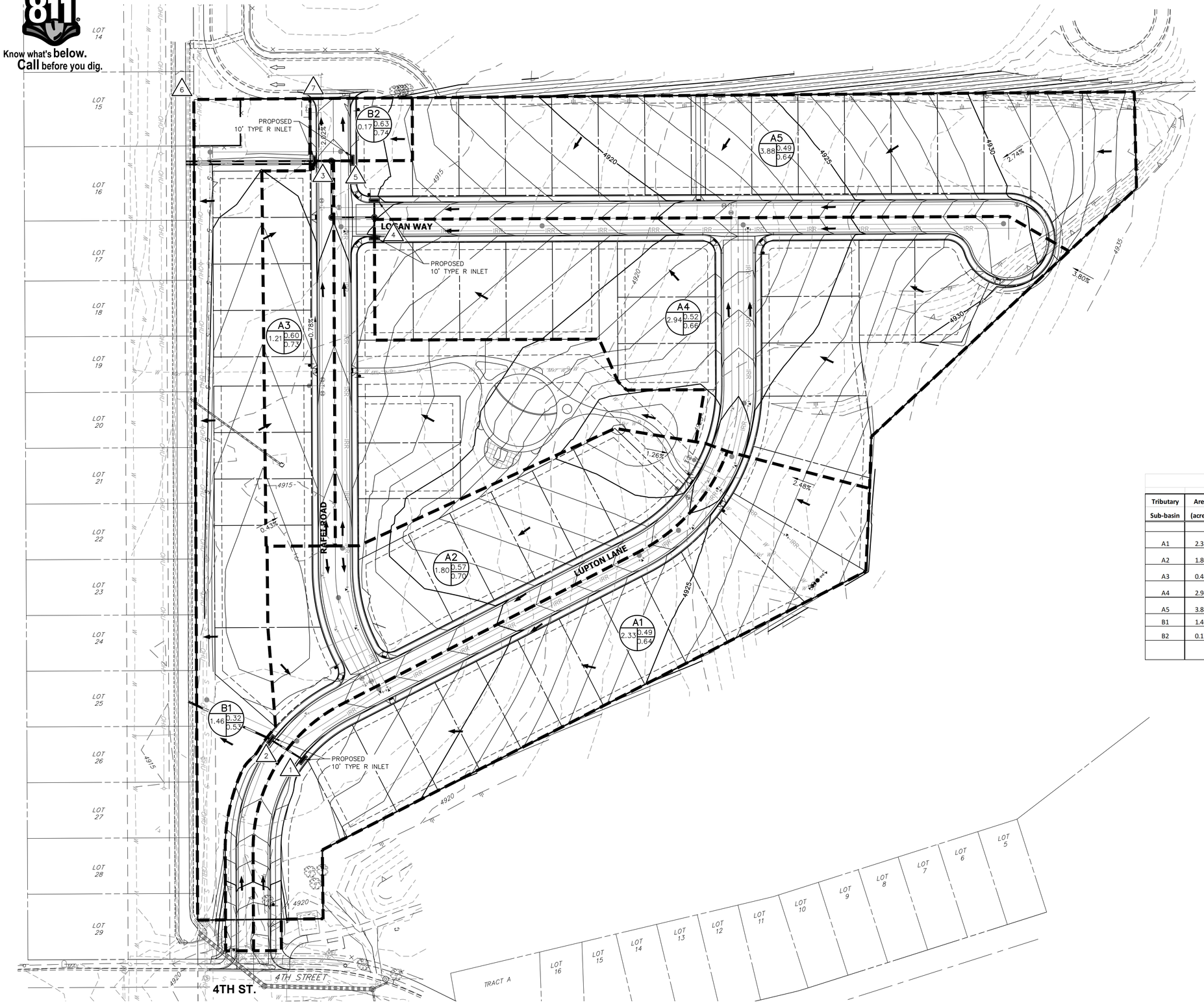
SERVICE PLAN

SHEET 17 OF 46

JOB NO. 16093.00

# COYOTE CREEK FILING NO. 4

811 Know what's below. Call before you dig.




**BASIN SUMMARY TABLE**

| Tributary Sub-basin | Area (acres) | Percent Impervious | $C_5$ | $C_{100}$ | $t_c$ (min) | $Q_5$ (cfs) | $Q_{100}$ (cfs) |
|---|---|---|---|---|---|---|---|
| A1 | 2.33 | 52% | 0.49 | 0.64 | 13.0 | 3.9 | 9.8 |
| A2 | 1.80 | 62% | 0.57 | 0.70 | 11.4 | 3.8 | 8.8 |
| A3 | 0.48 | 64% | 0.60 | 0.73 | 9.7 | 1.1 | 2.6 |
| A4 | 2.94 | 56% | 0.52 | 0.66 | 11.1 | 5.7 | 13.8 |
| A5 | 3.88 | 51% | 0.49 | 0.64 | 13.7 | 6.4 | 16.1 |
| B1 | 1.46 | 29% | 0.32 | 0.53 | 13.8 | 1.6 | 5.0 |
| B2 | 0.17 | 69% | 0.63 | 0.74 | 5.0 | 0.5 | 1.2 |

N

50 25 0 50 100
ORIGINAL SCALE: 1" = 50'

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| No. | REVISION | BY | DATE |
|---|---|---|---|
| | | | |

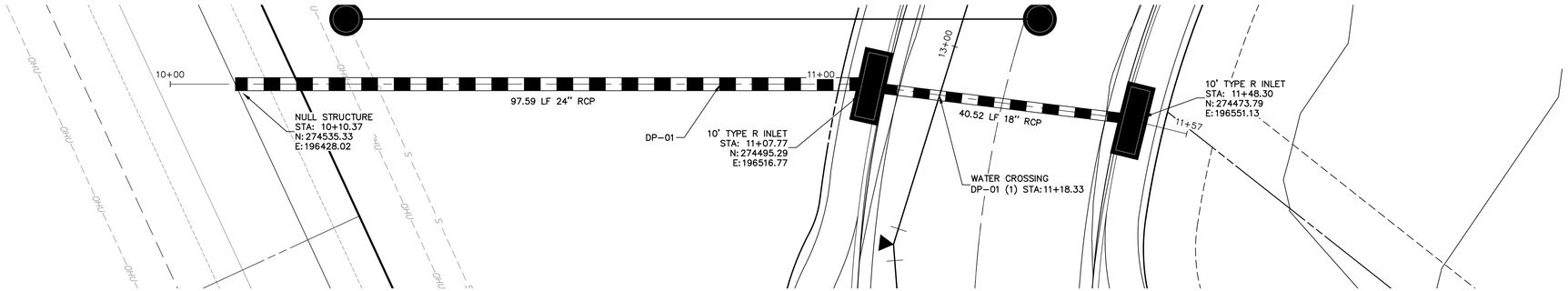
| | |
|---|---|
| H-SCALE | 1"=50' |
| V-SCALE | 1"=X' |
| DATE | 12/13/21 |
| DESIGNED BY | AJH |
| DRAWN BY | XXX |
| CHECKED BY | |

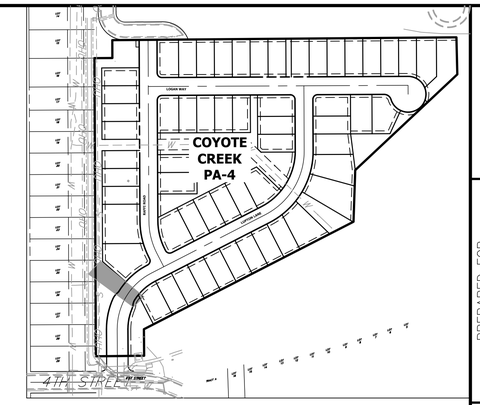
COYOTE CREEK FILING NO. 4

FINAL DRAINAGE PLAN

SHEET 18 OF 27

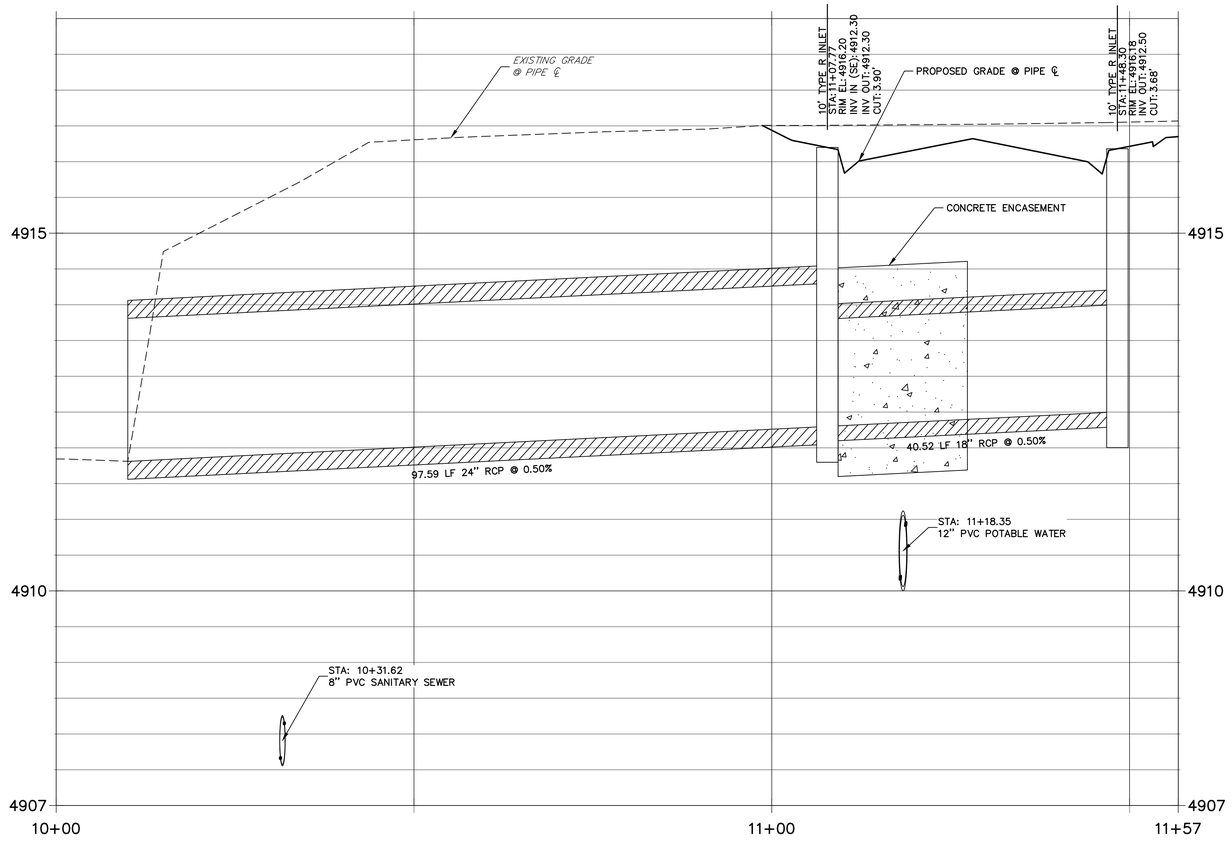
JOB NO. 16093.00




**KEY MAP**
N.T.S.

## DP-01 PROFILE
## STA 10+00.00 TO 11+56.80




50 25 0 50 100
HORIZONTAL
ORIGINAL SCALE: 1" = 50'
VERTICAL
ORIGINAL SCALE: 1" = 5'

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Fort Collins 970-491-9888 • www.jrengineering.com

| No. | REVISION | BY | DATE |
|---|---|---|---|
| | | | |

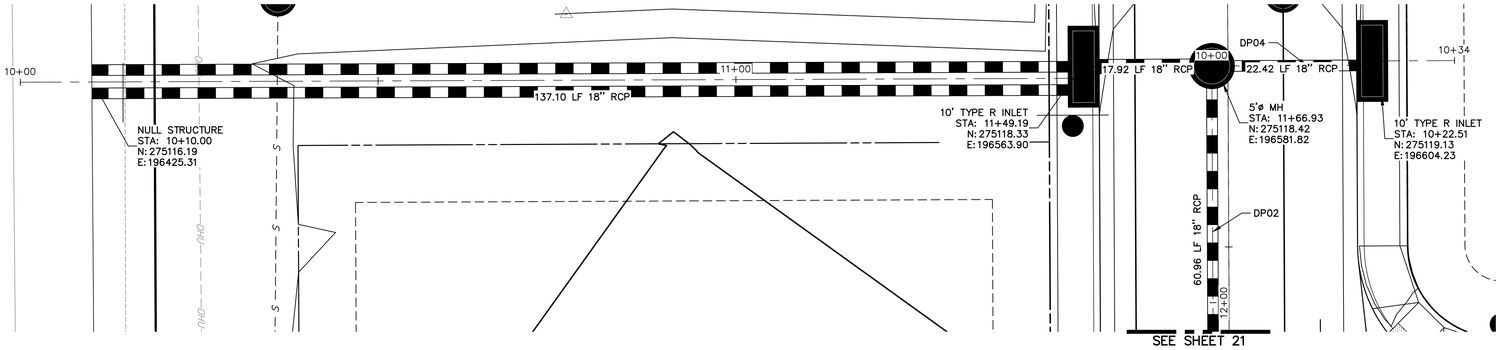
| | |
|---|---|
| H-SCALE | 1"=50' |
| V-SCALE | 1"=5' |
| DATE | 12/13/21 |
| DESIGNED BY | AJH |
| DRAWN BY | AJH |
| CHECKED BY | |

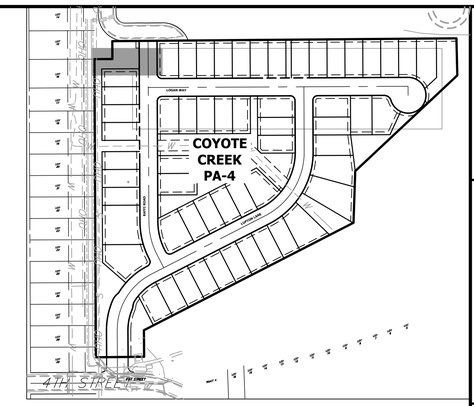
COYOTE CREEK FILING NO 4

STORM SEWER PLAN & PROFILE

SHEET 7 OF 46

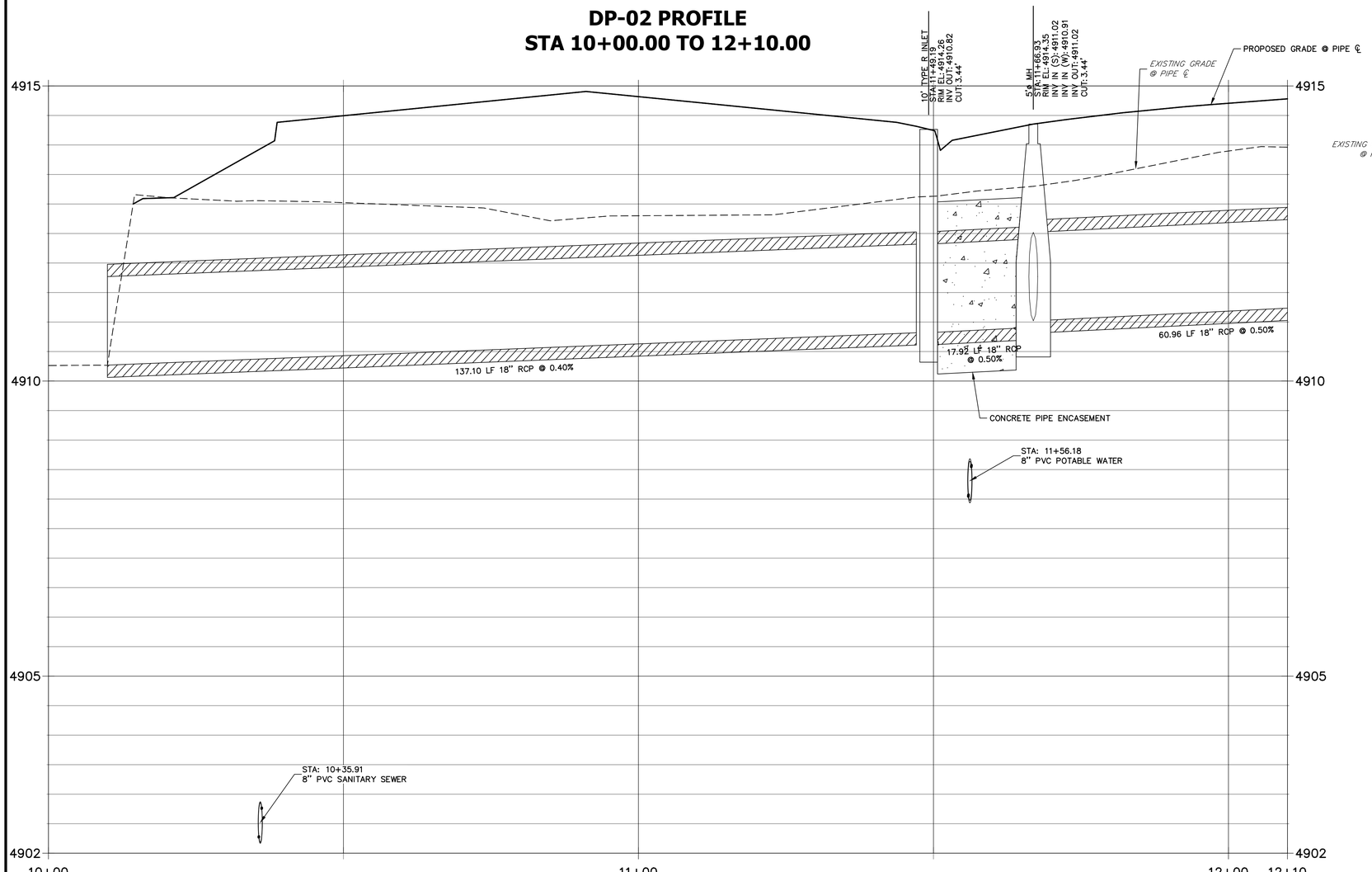
JOB NO. 16093.00



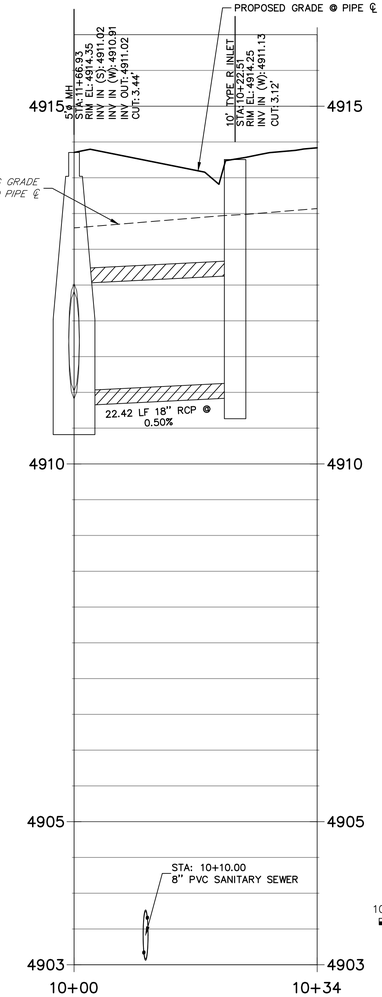



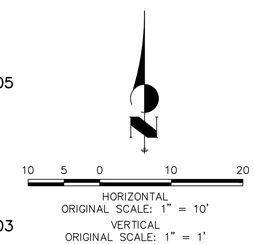

## KEY MAP
N.T.S.

## DP-02 PROFILE
## STA 10+00.00 TO 12+10.00




## DP04-PROFILE
## STA 10+00.00 TO 10+33.98

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| No. | REVISION | BY | DATE |
|---|---|---|---|
| | | | |

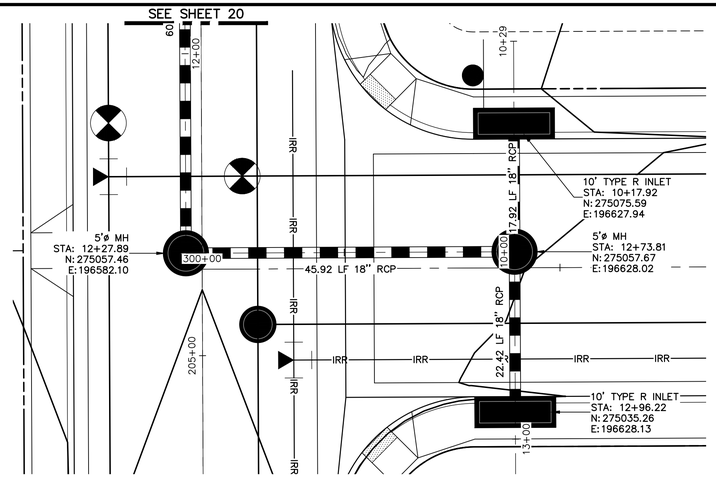
| | |
|---|---|
| H-SCALE | 1"=50' |
| V-SCALE | 1"=5' |
| DATE | 12/13/21 |
| DESIGNED BY | AJH |
| DRAWN BY | AJH |
| CHECKED BY | |

COYOTE CREEK FILING NO 4

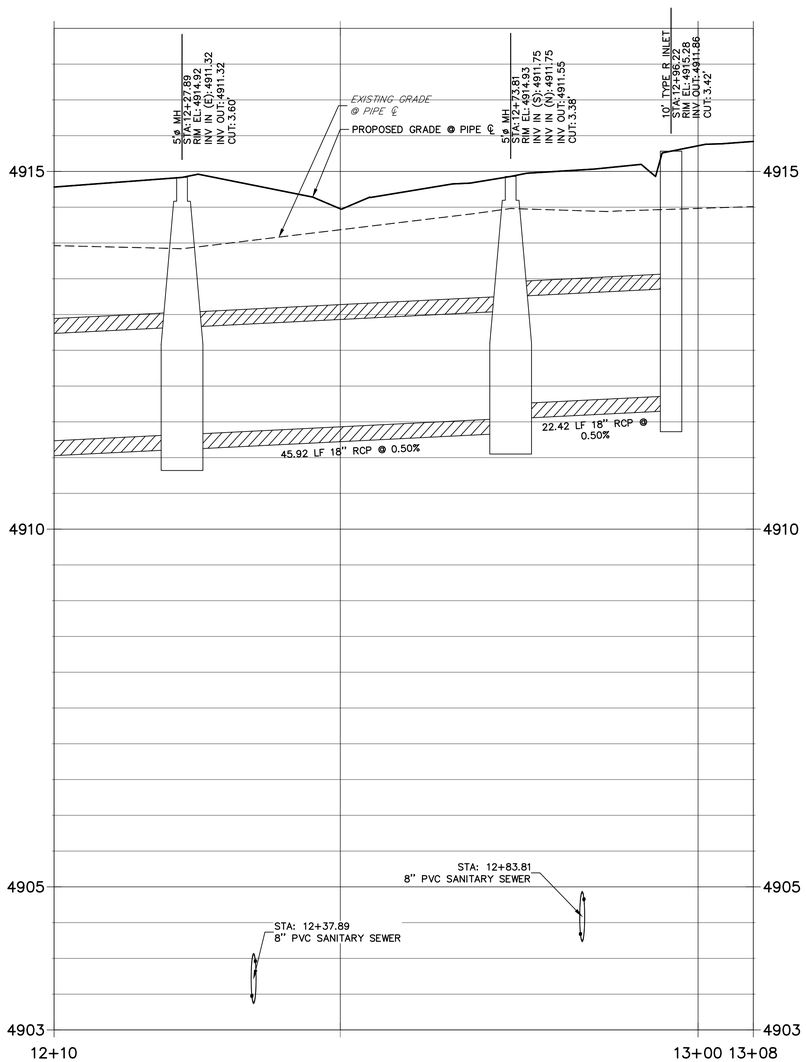
STORM SEWER PLAN & PROFILE

SHEET 9 OF 46

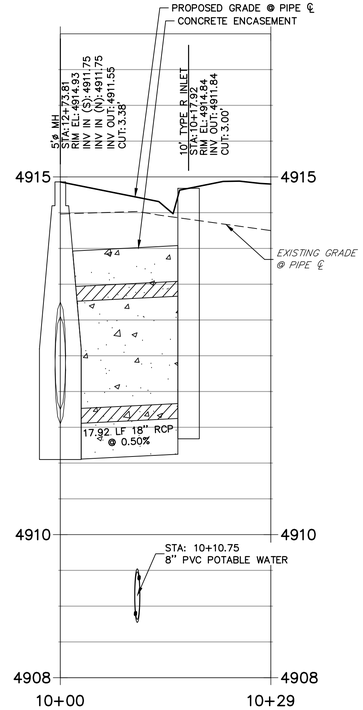
JOB NO. 16093.00

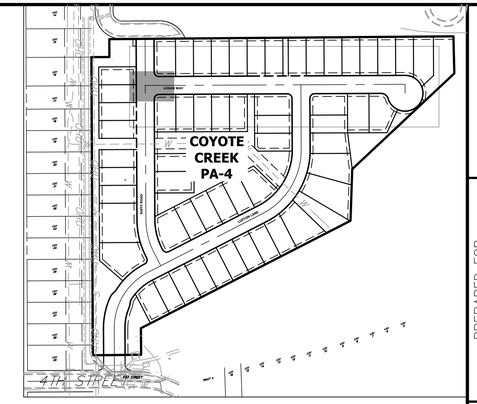



## DP-02 PROFILE (1)
## STA 12+10.00 TO 13+07.72




## DP-03 PROFILE
## STA 10+00.00 TO 10+29.42




**KEY MAP**
N.T.S.

10 5 0 10 20
HORIZONTAL
ORIGINAL SCALE: 1" = 10'
VERTICAL
ORIGINAL SCALE: 1" = 1'

Know what's **below.**
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PREPARED FOR
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| No. | REVISION | BY | DATE |
|---|---|---|---|
| | | | |

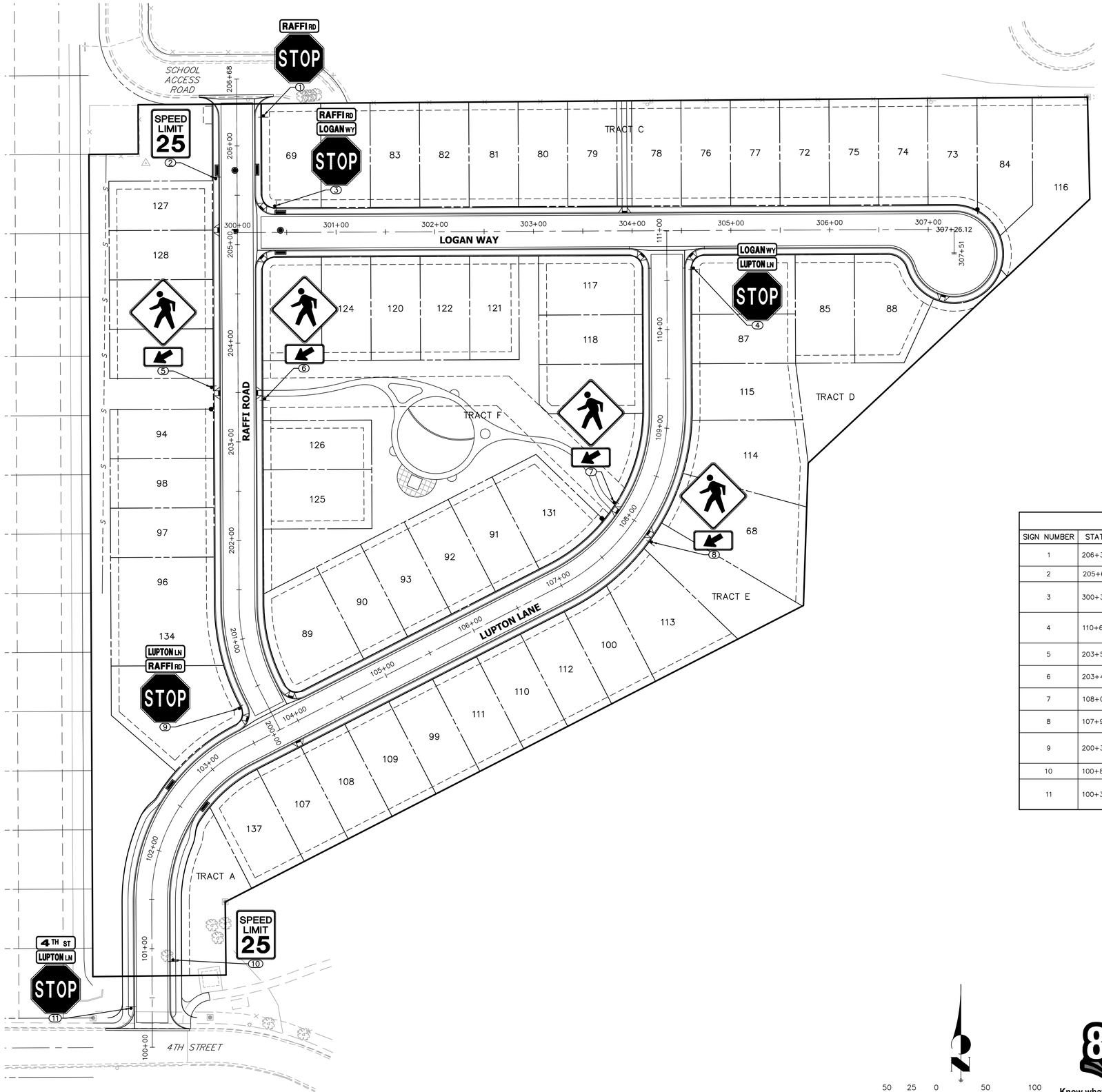
| | |
|---|---|
| H-SCALE | 1"=50' |
| V-SCALE | 1"=5' |
| DATE | 12/13/21 |
| DESIGNED BY | AJH |
| DRAWN BY | AJH |
| CHECKED BY | |

COYOTE CREEK FILING NO 4

STORM SEWER PLAN & PROFILE

SHEET 9 OF 46

JOB NO. 16093.00




| SIGN TABULATION | | | | |
|---|---|---|---|---|
| SIGN NUMBER | STATION | OFFSET | ALIGNMENT | DESCRIPTION |
| 1 | 206+30.47 | 26.92' (R) | CL– RAFFI ROAD | 24"X8" D3–1<br>30"X30" R1–1 |
| 2 | 205+67.01 | 21.71' (L) | CL– RAFFI ROAD | 24"X30" R2–1 |
| 3 | 300+37.95 | 26.92' (L) | CL– LOGAN WAY | 24"X8" D3–1<br>24"X8" D3–1<br>30"X30" R1–1 |
| 4 | 110+62.27 | 26.92' (R) | CL– LUPTON LANE | 24"X8" D3–1<br>24"X8" D3–1<br>30"X30" R1–1 |
| 5 | 203+55.33 | 26.92' (L) | CL– RAFFI ROAD | 30"X30" W11–2<br>24"X12" W16–7PL |
| 6 | 203+43.59 | 26.92' (R) | CL– RAFFI ROAD | 30"X30" W11–2<br>24"X12" W16–7PL |
| 7 | 108+04.15 | 26.92' (L) | CL– LUPTON LANE | 30"X30" W11–2<br>24"X12" W16–7PL |
| 8 | 107+92.39 | 26.92' (R) | CL– LUPTON LANE | 30"X30" W11–2<br>24"X12" W16–7PL |
| 9 | 200+38.00 | 26.92' (L) | CL– RAFFI ROAD | 24"X8" D3–1<br>24"X8" D3–1<br>30"X30" R1–1 |
| 10 | 100+88.43 | 21.42' (R) | CL– LUPTON LANE | 24"X30" R2–1 |
| 11 | 100+39.67 | 21.42' (L) | CL– LUPTON LANE | 24"X8" D3–1<br>24"X8" D3–1<br>30"X30" R1–1 |

50 25 0 50 100

ORIGINAL SCALE: 1" = 50'

Know what's below. Call before you dig.

## ENGINEER'S STATEMENT

PREPARED UNDER MY DIRECT SUPERVISION

ANDREW J. HUGILL, PE
COLORADO LIC. PE NO. 57007
FOR AND ON BEHALF OF JR ENGINEERING, LLC.

DATE

COLORADO LICENSED
ANDREW J. HUGILL
57007
PROFESSIONAL ENGINEER

UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, JR ENGINEERING APPROVES THEIR USE ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

PREPARED FOR
LUPTON LAND, LLC
10221 PRESTWICK TRAIL
LONE TREE, CO 80124
BOB QUINETTE
P–303.587.1966

J·R ENGINEERING
A Westrian Company
Centennial 303–740–9393 • Colorado Springs 719–593–2593
Fort Collins 970–491–9888 • www.jrengineering.com

| No. | REVISION | BY | DATE |
|---|---|---|---|
| | | | |

| | |
|---|---|
| H–SCALE | 1"=50' |
| V–SCALE | N/A |
| DATE | 12/13/21 |
| DESIGNED BY | AJH |
| DRAWN BY | CRB |
| CHECKED BY | |

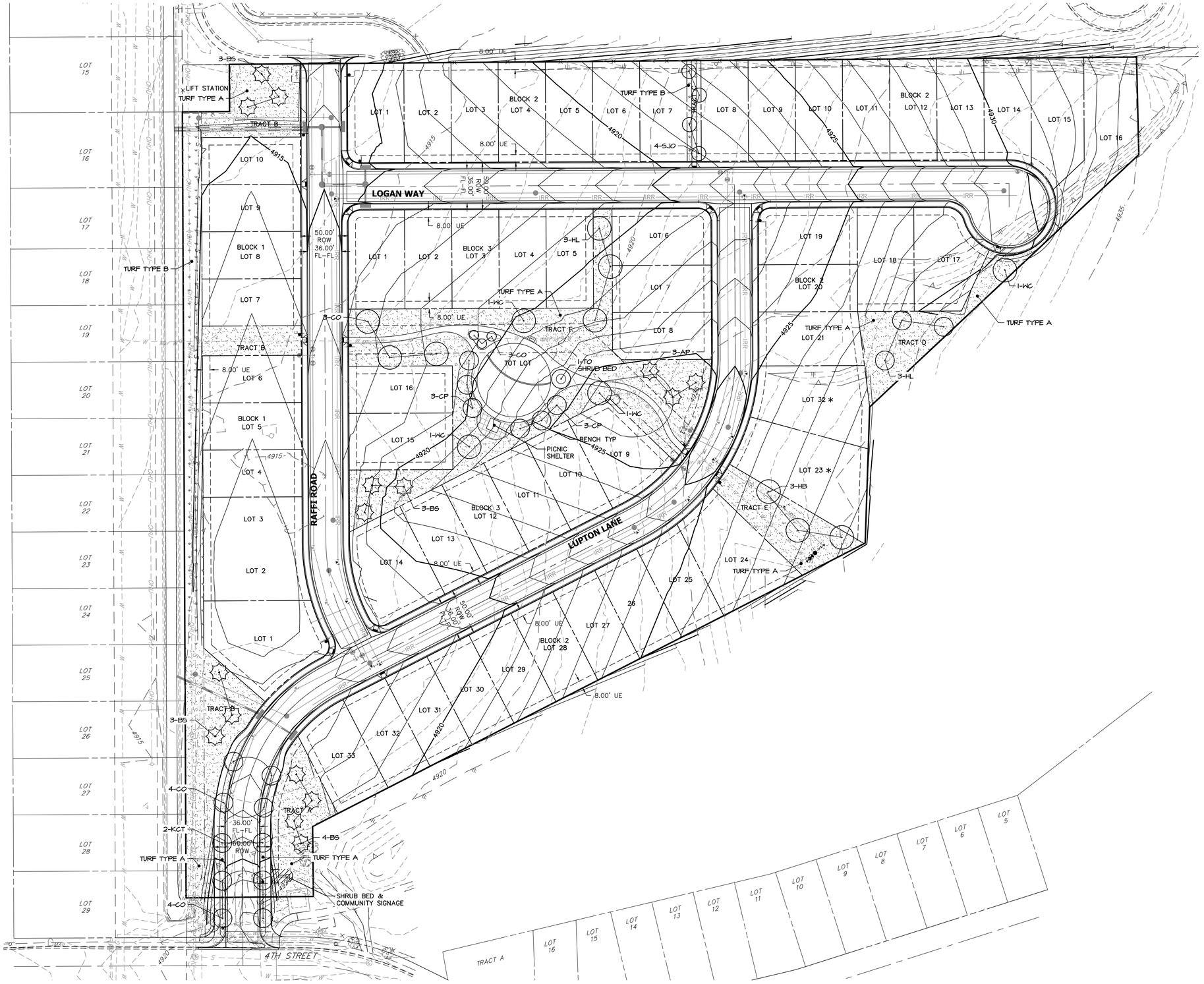
COYOTE CREEK FILING NO. 4

SIGNAGE PLAN

SHEET 22 OF 46

JOB NO. 16093.00

# COYOTE CREEK FILING NO. 4




## LANDSCAPE LEGEND

- EXISTING CONIFEROUS TREE TO BE PRESERVED
- EXISTING DECIDUOUS TREE TO BE PRESERVED
- PROPOSED MINOR/1' CONTOUR
- PROPOSED MAJOR/5' CONTOUR
- STEEL HEADER
- **TURF TYPE A:** IRRIGATED HYBRID KENTUCKY X TEXAS BLUE GRASS SOD, TURF MASTER ENVIROTURF OR APPROVED EQUAL
- **TURF TYPE B:** DROUGHT TOLERANT IRRIGATED TURF SEED MIX
- CONIFEROUS TREE 6' HGT
- DECIDUOUS STREET/ SHADE TREE, 2" CALIPER
- ORNAMENTAL TREE, 1 1/2" CALIPER SIZE
- STOP SIGN OR PARKING SIGN
- FIRE HYDRANT

## SITE LEGEND

- BOUNDARY LINE
- PROPERTY LINE
- EXISTING EASEMENT LINE
- PROPOSED EASEMENT LINE
- RIGHT OF WAY
- EXISTING WOODEN FENCE
- EXISTING GAS MAIN
- EXISTING SANITARY SEWER
- PROPOSED SANITARY SEWER
- EXISTING WATER MAIN
- PROPOSED WATER MAIN
- PROPOSED ELECTRIC
- EXISTING STORM DRAIN
- PROPOSED STORM DRAIN
- EXISTING CURB AND GUTTER
- PROPOSED SIGN
- PROPOSED CURB AND GUTTER
- EXISTING STREET LIGHTS
- PROPOSED STREET LIGHT
- 3/4" METER VAULTS
- FIRE HYDRANT

50 25 0 50 100

ORIGINAL SCALE: 1" = 50'

Know what's **below.** **Call** before you dig.

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PREPARED FOR
LUPTON LAND, LLC
10221 PRESTWICK TRAIL
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Fort Collins 970-491-9888 • www.jrengineering.com


| No. | REVISION | BY | DATE |
|---|---|---|---|
| | | | |

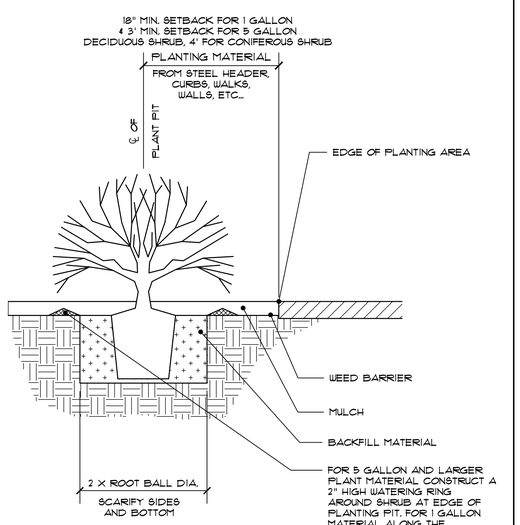
| | |
|---|---|
| H-SCALE | 1"=50' |
| V-SCALE | 1"=X' |
| DATE | 12/13/21 |
| DESIGNED BY | AJH |
| DRAWN BY | XXX |
| CHECKED BY | |

COYOTE CREEK FILING NO. 4

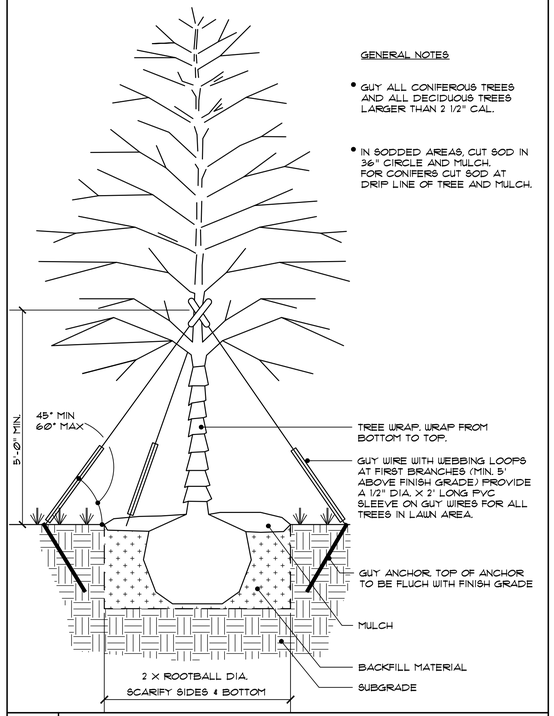
LANDSCAPE PLAN

SHEET 23 OF 46

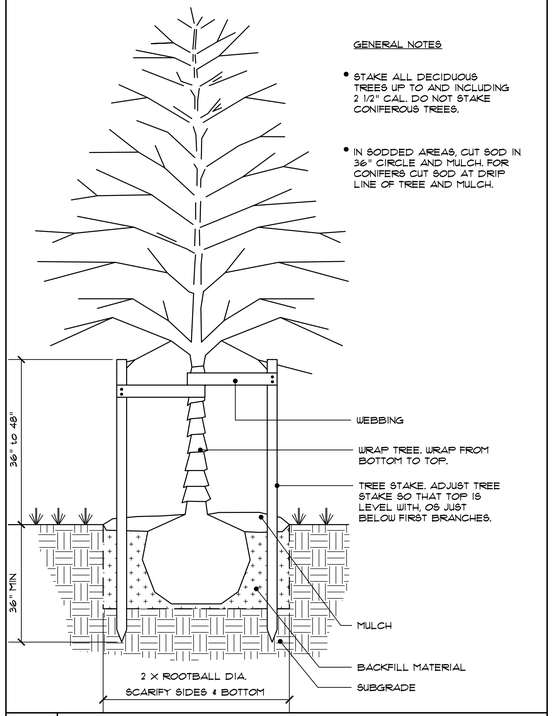
JOB NO. 16093.00



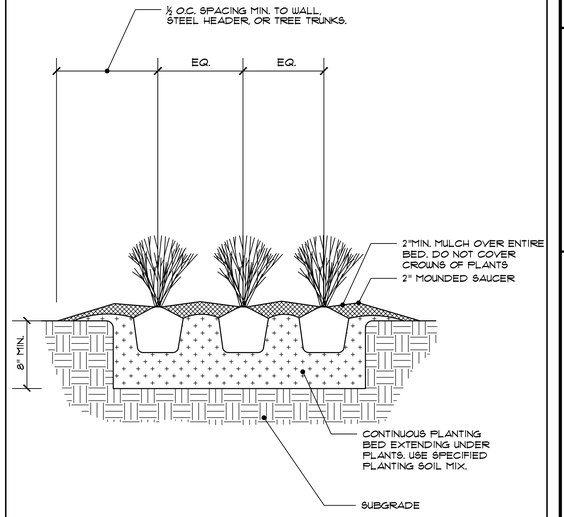

A | SHRUB PLANTING



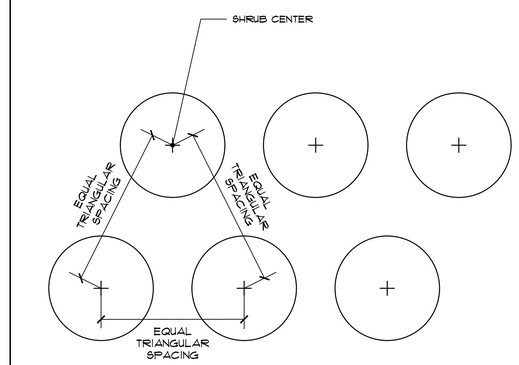

B | TREE PLANTING AND GUYING




C | TREE PLANTING AND STAKING




D | PERENNIAL PLANTING




E | TRIANGULAR SHRUB SPACING

## CONIFEROUS TREES

| Quantity | Symbol | Common Name | Botanical Name | Mitigation Size | Cont. | Kc Value | Species Diversity |
|---|---|---|---|---|---|---|---|
| 6 | AP | Autrian Pine | Pinus Nigra | 8' HGT. | B4B | L | |
| 3 | BS | Colorado Blue Spruce | Picea Pungens 'Colorado Blue' | 8' Hgt | B4B | L | |

## DECIDUOUS TREES

| Quantity | Symbol | Common Name | Botanical Name | Size | Cond. | Kc Value | Species Diversity |
|---|---|---|---|---|---|---|---|
| 8 | CO | Chinkapin Oak | Quercus Muehlenbergii | 2" Cal | B4B | M | |
| 3 | HB | Hackberry | Celtis Occidentalis | 2" Cal | B4B | L | |
| 5 | KCT | Kentucky Coffeetree | Gymnocladus Dioicus 'Espresso' | 2" Cal | B4B | L | |
| 3 | WC | Western Catalpa | Capalpa Speciosa | 3" Cal | B4B | L | |
| 1 | TRO | Texas Red Oak | Quercus Buckley | 2" Cal | B4B | L | |
| 4 | SJO | Skinny Jeans Oak | Quercus | 2" Cal | B4B | L | |

## ORNAMENTAL TREES

| Quantity | Symbol | Common Name | Botanical Name | Size | Cond. | Kc Value | Species Diversity |
|---|---|---|---|---|---|---|---|
| 6 | CP | Chanticleer Pear | Pyrus Calleryana 'Chanticleer' | 2" Cal | B4B | M | |
| 3 | ABS | Autumn Brilliance Serviceberry | Amelanchier x 'Autumn Brilliance' | 1 1/2" Cal | B4B | M | |

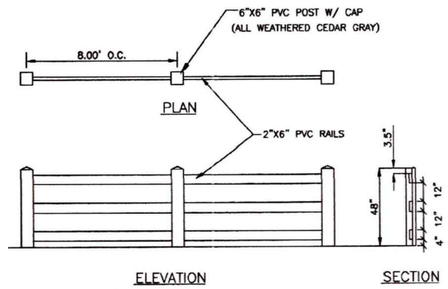
33 **Total Trees** **100%**

## TURF TYPE A:
## DROUGHT TOLERANT IRRIGATED SOD MIX

HYBRID KENTUCKY x TEXAS BLUEGRASS BEING A MIX OF 100% TEXAS BLUEGRASS HYBRID SEED. THE SEED SOURCE & TURF BASED MIX FOR SOD SHALL BE APPROVED BY THE LANDSCAPE ARCHITECT BEFORE INSTALLATION OF SOD.

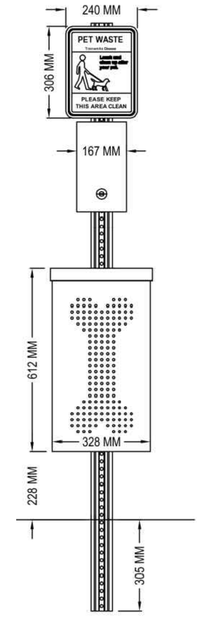
## TURF TYPE B:
## DROUGHT TOLERANT IRRIGATED TURF SEED MIX

30% EPHRAIM CRESTED WHEATGRASS, 25% DWARF PERENNIAL RYSEGRASS, 20% SR3200 BLUE FESCUE, 15% REUBENS CANADA BLUEGRASS, 10% CHEWINGS FESCUE.
**TOTAL: 15 LBS/ACRE (DRILLED) = 55 SEEDS/SF**




## SPLIT RAIL FENCE

SCALE: NTS




## DOG WASTE STATION

SCALE: NTS

UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, JR ENGINEERING APPROVES THEIR USE ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

PREPARED FOR
LUPTON LAND, LLC
10221 PRESTWICK TRAIL
LONE TREE, CO 80124
ROB QUINETTE
P-303.587.1966

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Fort Collins 970-491-9888 • www.jrengineering.com

| No. | REVISION | BY | DATE |
|---|---|---|---|
| | | | |

| | |
|---|---|
| H-SCALE | N/A |
| V-SCALE | N/A |
| DATE | 12/15/21 |
| DESIGNED BY | AJH |
| DRAWN BY | AJH |
| CHECKED BY | |

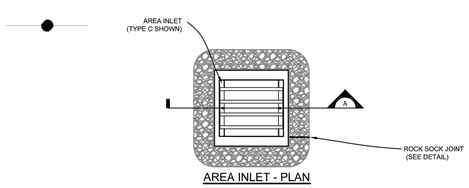
COYOTE CREEK FILING NO. 4

LANDSCAPE DETAILS

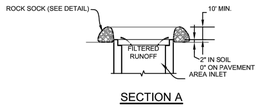
SHEET 24 OF 46

JOB NO. 16093.00

IP




AREA INLET - PLAN




SECTION A

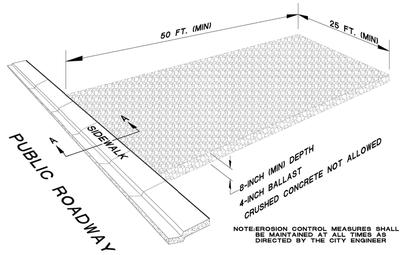
INLET PROTECTION INSTALLATION NOTES

1. INLET PROTECTION AFTER INLET CONSTRUCTION OF AFTER PAVEMENT SHALL BE INSTALLED WITHIN 48 HOUR AFTER INLET CONSTRUCTION OR PAVING IS COMPLETED.
2. STRAW WATTLES/SEDIMENT CONTROL LOGS MAY BE USED IN PLACE OF ROCK SOCKS FOR INLETS IN PERVIOUS AREAS. INSTALL PER SEDIMENT CONTROL LOG DETAIL.

INLET PROTECTION MAINTENANCE NOTES

1. THE SWMP MANAGER SHALL INSPECT INLET PROTECTION WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT AS NECESSARY. INSPECT MORE FREQUENTLY DURING WINTER CONDITIONS DUE TO FREEZE/THAW PROBLEMS. REPAIRS AS NEEDED.
2. SEDIMENT ACCUMULATED UPSTREAM OF INLET PROTECTION SHALL BE REMOVED WHEN THE SEDIMENT DEPTH UPSTREAM OF ROCK BERM IS WITHIN 2-1/2 INCHES OF THE CREST.
3. INLET PROTECTION IS TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVER IS APPROVED, UNLESS THE CITY APPROVES EARLIER REMOVAL OF INLET PROTECTION IN STREETS.
4. WHEN INLET PROTECTION AT AREA INLETS IS REMOVED, THE DISTURBED AREA SHALL BE COVERED WITH TOP SOIL, DRILL SEEDED AND CRIMP MULCHED, OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE CITY .

| CITY OF Fort Lupton EST. 1836 COME PAINT YOUR FUTURE WITH US | DESIGN STANDARDS | STANDARD DRAWING |
|---|---|---|
| | AREA INLET PROTECTION USING GRAVEL FILTER | EC 7 |
| | | DATE: 8/15/14 |



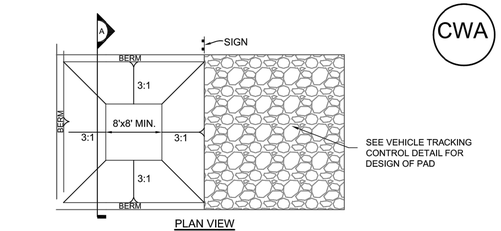

SECTION A-A
-NTS-

NOTES

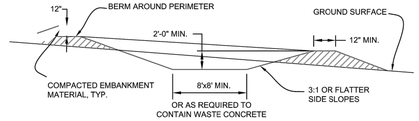
1. ALL ROCK TO BE REMOVED UPON COMPLETION OF CONSTRUCTION.
2. PUBLIC ROADWAY TO BE KEPT CLEAN AND FREE OF MUD, DIRT AND DEBRI AT ALL TIMES.

| CITY OF Fort Lupton EST. 1836 COME PAINT YOUR FUTURE WITH US | DESIGN STANDARDS | STANDARD DRAWING |
|---|---|---|
| | VEHICLE TRACKING PAD | EC 8 |
| | | DATE: 8/15/14 |

CWA




PLAN VIEW




SECTION A

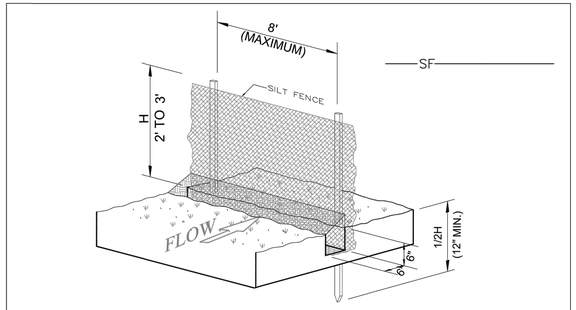
CONCRETE WASHOUT AREA INSTALLATION NOTES

1. SEE PLAN VIEW FOR LOCATIONS OF CONCRETE WASHOUT AREA.
2. THE CONCRETE WASHOUT AREA SHALL BE INSTALLED PRIOR TO ANY CONCRETE PLACEMENT ON SITE.
3. VEHICLE TRACKING CONTROL IS REQUIRED AT THE ACCESS POINT.
4. SIGNS SHALL BE PLACED AT THE CONSTRUCTION ENTRANCE, AT THE WASHOUT AREA, AND ELSEWHERE AS NECESSARY TO CLEARLY INDICATE THE LOCATION OF THE CONCRETE WASHOUT ARE TO OPERATORS OF CONCRETE TRCUYKS AND PUMP RIGS.

CONCRETE WASHOUT AREA MAINTENANCE NOTES

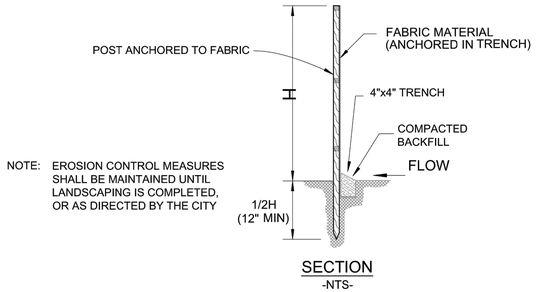
1. THE CONCRETE WASHOUT AREA SHALL BE REPAIRED AND ENLARGED OR CLEANED OUT AS NECESSARY TO MAINTAIN CAPACITY FOR WASTED CONCRETE.
2. AT THE END OF CONSTRUCTION, ALL CONCRETE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF AT AND APPROVED WASTE SITE.
3. WHEN THE CONCRETE WASHOUT AREA IS REMOVED, COVER THE DISTURBED AREA WITH TOP SOIL, DRILL SEED AND CRIMP MULCH, OR OTHERWISE STABILZE IN A MANNER APPROVED BY THE CITY.
4. INSPECT WEEKLY, DURING AND AFTER ANY STORM EVENT.
5. PORTABLE ROLLOFF TYPE OF CONCRETE WASHOUT FACILITIES WILL ALSO BE ALLOWED.

| CITY OF Fort Lupton EST. 1836 COME PAINT YOUR FUTURE WITH US | DESIGN STANDARDS | STANDARD DRAWING |
|---|---|---|
| | CONCRETE WASHOUT AREA | EC 9 |
| | | DATE: 8/15/14 |




SILT FENCE INSTALLATION

-NTS-

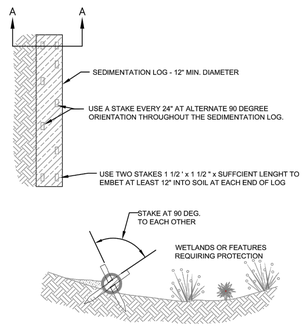



SECTION

-NTS-

| CITY OF Fort Lupton EST. 1836 COME PAINT YOUR FUTURE WITH US | DESIGN STANDARDS | STANDARD DRAWING |
|---|---|---|
| | SILT FENCE | EC 15 |
| | | DATE: 8/15/14 |

SCL




SECTION A - A

SEDIMENT CONTROL LOG INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   - LOCATION AND LENGTH OF SEDIMENT CONTROL LOG.
2. SEDIMENT CONTROL LOGS INDICATED ON INITIAL SWMP PLAN SHALL BE INSTALLED PRIOR TO ANY LAND-DISTURBING ACTIVITIES.
3. SEDIMENT CONTROL LOGS SHALL CONSIST OF STRAW, COMPOST, EXCELSIOR, OR COCONUT FIBER.
4. NOT FOR USE IN CONCENTRATED FLOW AREAS.
5. THE SEDIMENT CONTROL LOG SHALL BE TRENCHED INTO THE GROUND A MINIMUM OF 2".

SEDIMENT CONTROL LOG MAINTENANCE NOTES

1. THE SWMP MANAGER SHALL INSPECT SEDIMENT CONTROL LOGS DAILY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT UPSTREAM SEDIMENT AS NECESSARY.
2. SEDIMENT ACCUMULATED UPSTREAM OF SEDIMENT CONTROL LOGS SHALL BE REMOVED WHEN THE UPSTREAM SEDIMENT DEPTH IS WITHIN ½ THE HEIGHT OF THE CREST OF LOG.
3. SEDIMENT CONTROL LOG SHALL BE REMOVED AT THE END OF CONSTRUCTION. IF ANY DISTURBED AREA EXISTS AFTER REMOVAL, IT SHALL BE COVERED WITH TOP SOIL, DRILL SEEDED AND CRIMP MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE CITY.

| CITY OF Fort Lupton EST. 1836 COME PAINT YOUR FUTURE WITH US | DESIGN STANDARDS | STANDARD DRAWING |
|---|---|---|
| | SEDIMENT CONTROL LOGS | EC 16 |
| | | DATE: 8/15/14 |

811 Know what's below. Call before you dig.

## ENGINEER'S STATEMENT

STANDARD DETAILS SHOWN WERE REVIEWED ONLY AS TO THEIR APPLICATION ON THIS PROJECT.

ANDREW J. HUGILL, PE
COLORADO LIC. PE NO. 57007
FOR AND ON BEHALF OF JR ENGINEERING, LLC.

DATE

UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, JR ENGINEERING APPROVES THEIR USE ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

PREPARED FOR
LUPTON LAND, LLC
10221 PRESTWICK TRAIL
LONE TREE, CO 80124
BOB QUINETTE
P-303.587.1966

J·R ENGINEERING
A Westrian Company
Centennial 303-740-9393 • Colorado Springs 719-593-2593
Fort Collins 970-491-9888 • www.jrengineering.com

| No. | REVISION | BY | DATE |
|---|---|---|---|

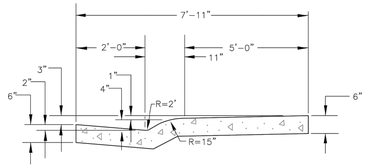
| | |
|---|---|
| H-SCALE | N/A |
| V-SCALE | N/A |
| DATE | 12/13/21 |
| DESIGNED BY | N/A |
| DRAWN BY | SWW |
| CHECKED BY | |

COYOTE CREEK FILING NO 4

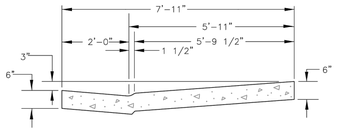
DETAILS

SHEET 25 OF 46

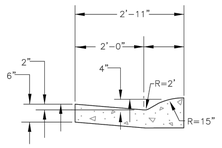
JOB NO. 16093.00




COMBINATION CURB, GUTTER & WALK
STANDARD SECTION

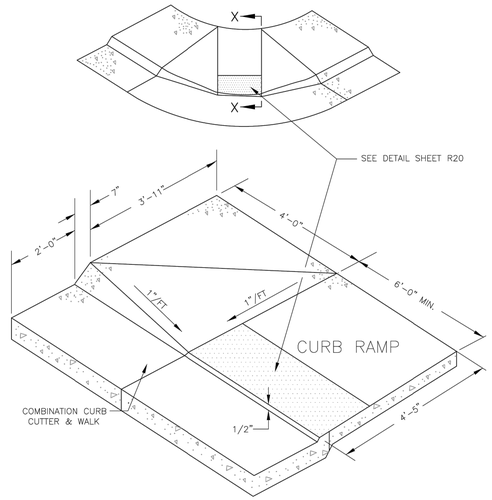



COMBINATION CURB, GUTTER & WALK
DEPRESSED SECTION




4" MOUNTABLE CURB & GUTTER

| CITY OF Fort Lupton EST. 1836 COME PAINT YOUR FUTURE WITH US | DESIGN STANDARDS | STANDARD DRAWING |
|---|---|---|
| | COMBINATION CURB, GUTTER, AND WALK | R8 |
| | | DATE: 8/15/14 |

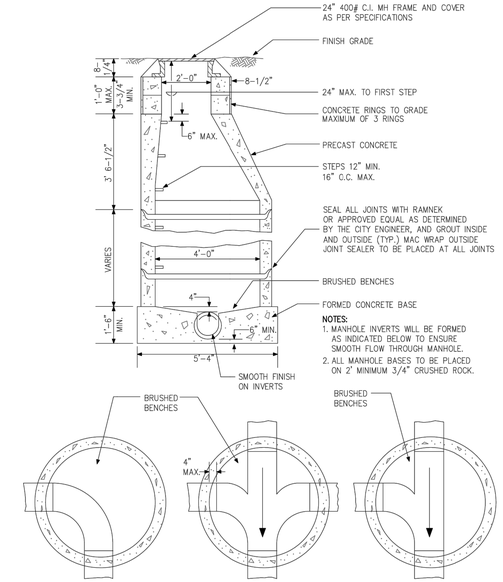



SECTION X–X

NOTE:

* COARSE BROOM FINISH ON RAMP.
* SPECIAL DESIGNS ARE REQUIRED WHEN GRADES ARE OVER 4% OR WHERE THE ANGLE OF THE INTERSECTION IS LESS THAN 78 DEGREES OR MORE THAN 105 DEGREES.
* MAINTAIN BACK OF WALK ELEVATION AT 2.0% ABOVE TOP OF CURB.

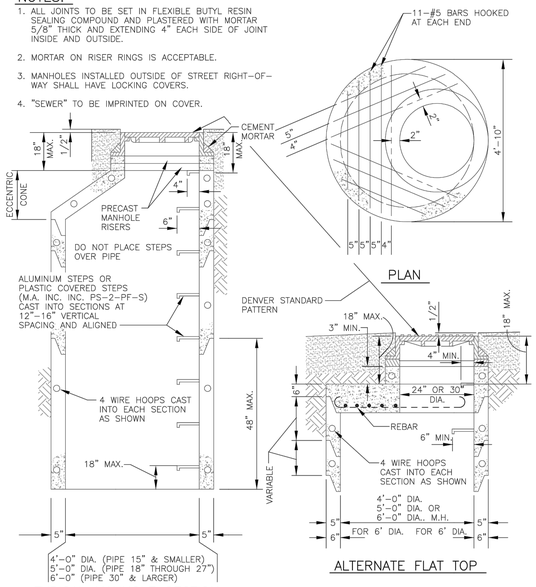
| CITY OF Fort Lupton EST. 1836 COME PAINT YOUR FUTURE WITH US | DESIGN STANDARDS | STANDARD DRAWING |
|---|---|---|
| | CURB RAMP COMBINATION CURB, GUTTER, AND WALK | R9 |
| | | DATE: 8/15/14 |




| CITY OF Fort Lupton EST. 1836 COME PAINT YOUR FUTURE WITH US | DESIGN STANDARDS | STANDARD DRAWING |
|---|---|---|
| | SANITARY SEWER STANDARD MANHOLE | SS1 |
| | | DATE: 8/15/14 |

NOTES:

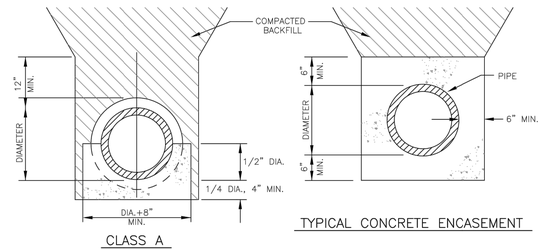
1. ALL JOINTS TO BE SET IN FLEXIBLE BUTYL RESIN SEALING COMPOUND AND PLASTERED WITH MORTAR 5/8" THICK AND EXTENDING 4" EACH SIDE OF JOINT INSIDE AND OUTSIDE.
2. MORTAR ON RISER RINGS IS ACCEPTABLE.
3. MANHOLES INSTALLED OUTSIDE OF STREET RIGHT–OF–WAY SHALL HAVE LOCKING COVERS.
4. "SEWER" TO BE IMPRINTED ON COVER.




TYPICAL MANHOLE SECTION
WITH ECCENTRIC CONE

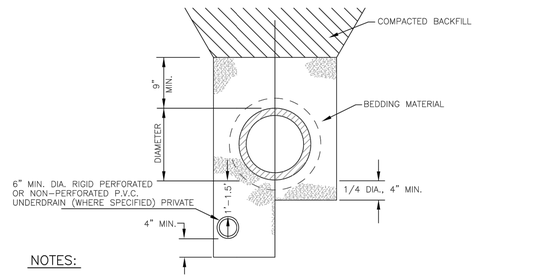
ALTERNATE FLAT TOP

| CITY OF Fort Lupton EST. 1836 COME PAINT YOUR FUTURE WITH US | DESIGN STANDARDS | STANDARD DRAWING |
|---|---|---|
| | MANHOLE BARRELS AND ALTERNATE TOPS | SS2 |
| | | DATE: 8/15/14 |




CLASS A
CONCRETE CRADLE

TYPICAL CONCRETE ENCASEMENT

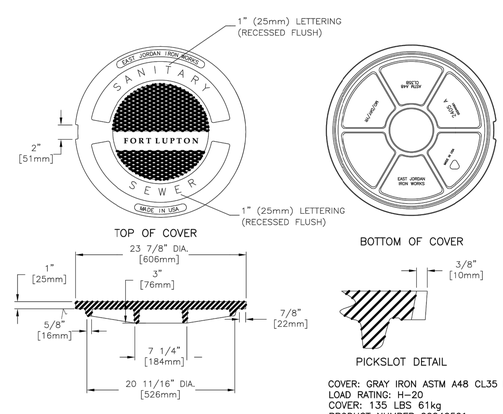



NOTES:

1. THIS DETAIL IS TO BE USED UNDER NORMAL CONDITIONS. WHERE EXCESSIVE GROUND WATER IS PRESENT AN ALTERNATE DESIGN WILL BE REQUIRED.

CLASS B
GRANULAR BEDDING

| CITY OF Fort Lupton EST. 1836 COME PAINT YOUR FUTURE WITH US | DESIGN STANDARDS | STANDARD DRAWING |
|---|---|---|
| | TYPICAL PIPE BEDDING | SS6 |
| | | DATE: 8/15/14 |




| CITY OF Fort Lupton EST. 1836 COME PAINT YOUR FUTURE WITH US | DESIGN STANDARDS | STANDARD DRAWING |
|---|---|---|
| | SANITARY SEWER MANHOLE LID | SS12 |
| | | DATE: 8/15/14 |

Know what's below. Call before you dig.

## ENGINEER'S STATEMENT

STANDARD DETAILS SHOWN WERE REVIEWED ONLY AS TO THEIR APPLICATION ON THIS PROJECT.

ANDREW J. HUGILL, PE
COLORADO LIC. PE NO. 57007
FOR AND ON BEHALF OF JR ENGINEERING, LLC.

DATE

UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, JR ENGINEERING APPROVES THEIR USE ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

PREPARED FOR
LUPTON LAND, LLC
10221 PRESTWICK TRAIL
LONE TREE, CO 80124
BOB QUINETTE
P–303.587.1966

J·R ENGINEERING
A Westrian Company
Centennial 303–740–9393 • Colorado Springs 719–593–2593
Fort Collins 970–491–9888 • www.jrengineering.com

| No. | REVISION | BY | DATE |
|---|---|---|---|

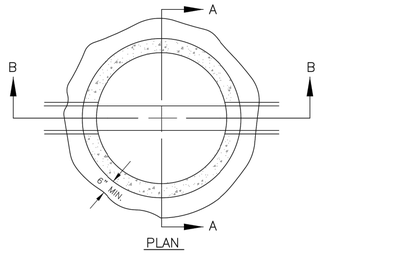
| | |
|---|---|
| H–SCALE | N/A |
| V–SCALE | N/A |
| DATE | 12/13/21 |
| DESIGNED BY | N/A |
| DRAWN BY | SWW |
| CHECKED BY | |

COYOTE CREEK FILING NO 4

DETAILS

SHEET 26 OF 46

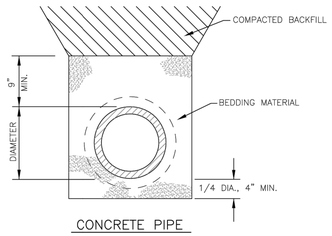
JOB NO. 16093.00




NOTES:

1. JOINTS TO BE SET IN FLEXIBLE BUTYL RESIN SEALING COMPOUND AND GROUTED WITH MORTAR INSIDE AND OUTSIDE.
2. BASES SHALL BE REINFORCED WHEN THE DISTANCE FROM INVERT TO TOP OF COVER WILL EXCEED 15 FT. REINFORCING TO BE APPROVED BY CITY ENGINEER.
3. SQUARE BASES ARE ACCEPTABLE.
4. FOR PIPE 36" AND LARGER, OR WHERE CONDITIONS SUCH AS MULTIPLE PIPES WARRANT, A CONCRETE BOX BASE WILL BE REQUIRED. (SEE CDOT STANDARD DRAWING M-604-20)

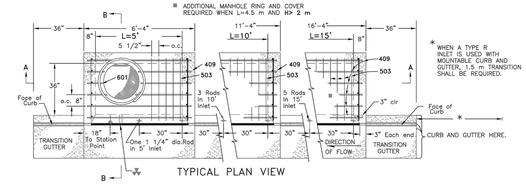
| DESIGN STANDARDS | STANDARD DRAWING |
|---|---|
| STANDARD MANHOLE BASE | ST1 |
| | DATE: 8/15/14 |

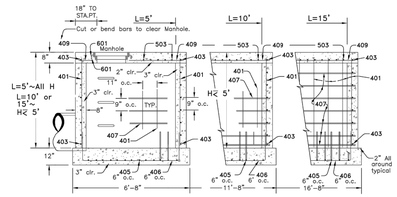


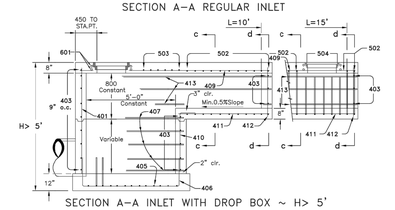

NOTES:

1. THIS DETAIL IS TO BE USED UNDER NORMAL CONDITIONS. WHERE EXCESSIVE GROUND WATER IS PRESENT AN ALTERNATE DESIGN WILL BE REQUIRED.

| DESIGN STANDARDS | STANDARD DRAWING |
|---|---|
| TYPICAL PIPE BEDDING | ST4 |
| | DATE: 8/15/14 |

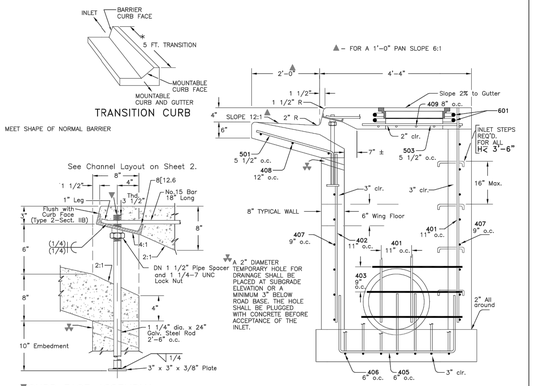


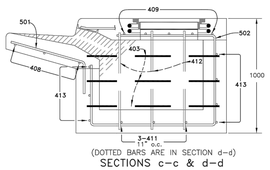




(1 OF 4)

| DESIGN STANDARDS | STANDARD DRAWING |
|---|---|
| CURB INLET TYPE R | ST5 |
| | DATE: 8/15/14 |




(2 OF 4)

| DESIGN STANDARDS | STANDARD DRAWING |
|---|---|
| CURB INLET TYPE R | ST6 |
| | DATE: 8/15/14 |

TABLE ONE ~ BAR LIST FOR CURB INLETS, TYPE "R"

| MARK | DIA (in) | O.C. SPACING (in) | TYPE | ALL INLETS L= 5' NO. REQ'D. | ALL INLETS L= 5' LENGTH (ft–in) | INLETS, H ≥ 5' 10' NO. REQ'D. | INLETS, H ≥ 5' 10' LENGTH (ft–in) | INLETS, H ≥ 5' 15' NO. REQ'D. | INLETS, H ≥ 5' 15' LENGTH (ft–in) | INLETS, H < 5' 10' NO. REQ'D. | INLETS, H < 5' 10' LENGTH (ft–in) | INLETS, H < 5' 15' NO. REQ'D. | INLETS, H < 5' 15' LENGTH (ft–in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 401 | # | 11" | II | 15 | * | 21 | * | 26 | * | 11 | * | 11 | * |
| 402 | # | 11" | II | 7 | * | 13 | * | 18 | * | 7 | * | 7 | * |
| 403 | # | 9" | II | * | 4'–0" | * | 4'–0" | * | 4'–0" | * | 4'–0" | * | 4'–0" |
| 405 | # | 6" | XI | 11 | 6'–10" | 21 | 6'–10" | 31 | 6'–10" | 11 | 6'–10" | 11 | 6'–10" |
| 406 | # | 6" | XIII | 7 | 8'–10" | 7 | 13'–10" | 7 | 18'–10" | 7 | 8'–10" | 7 | 8'–10" |
| 407 | 1/2" | 9" | II | * | 5'–10" | * | 10'–10" | * | 15'–10" | * | 5'–10" | * | 5'–10" |
| 408 | | 12" | II | 3 | 6'–0" | 3 | 11'–0" | 3 | 16'–0" | 3 | 11'–0" | 3 | 16'–0" |
| 409 | | 8" | II | 6 | 5'–10" | 6 | 10'–10" | 6 | 15'–10" | 6 | 10'–10" | 6 | 15'–10" |
| 410 | | 11" | XI | | | | | | | 3 | * | 3 | * |
| 411 | | 11" | II | | | | | | | 3 | 5'–2" | 3 | 10'–2" |
| 412 | | 11" | II | | | | | | | 3 | 2'–9" | 3 | 2'–9" |
| 413 | # | 9" | II | | | | | | | 7 | 10'–10" | 7 | 15'–10" |
| 501 | # | 5 1/2" | IX | 11 | 3'–4" | 22 | 3'–4" | 33 | 3'–4" | 22 | 3'–4" | 33 | 3'–4" |
| 502 | 5/8" | 5 1/2" | III | | | | | | | 11 | 11'–5" | 17 | 11'–5" |
| 503 | | 5 1/2" | II | 5 | 3'–6" | 16 | 3'–6" | 27 | 3'–6" | 6 | 3'–6" | 6 | 3'–6" |
| 504 | # | 5 1/2" | II | | | | | | | | | 5 | 8'–4" |
| 601 | 3/4" | 2 1/2" | V | 2 | 8'–10" | 2 | 8'–10" | 2 | 8'–10" | 2 | 8'–10" | 4 | 8'–10" |
| ØB | 8.5 | | | 1 | 5'–10" | 1 | 10'–10" | 1 | 15'–10" | 1 | 10'–10" | 1 | 15'–10" |
| ▼ | | | | 2 BARS, 1 ROD | —— | 4 BARS, 3 RODS | —— | 8 BARS, 5 RODS | —— | 4 BARS, 3 RODS | —— | 8 BARS, 5 RODS | —— |

* VARIABLE, REFER TO TABLE TWO.
Ø INCLUDE 18" NO. 4 BARS (SEE CHANNEL LAYOUT DETAIL).
▼ SEE CURB FACE ASSEMBLY ON SHEET 2 AND CHANNEL LAYOUT DETAILS ON SHEET 4.

REGULAR INLETS

DROP BOX INLETS

TABLE TWO ~ BARS AND QUANTITIES VARIABLE WITH "H"

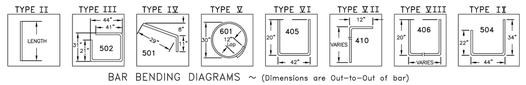
| "H" (ft–in) | LENGTH (ft–in) 401 | 402 | 410 | NO. REQD. Regular 403 | 407 | Drop Box 403 | 407 | L= 5' CONC. CU.YD. | L= 5' STEEL LBS. | L= 10' CONC. CU.YD. | L= 10' STEEL LBS. | L= 15' CONC. CU.YD. | L= 15' STEEL LBS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3'–0" | 2'–8" | 1'–8" | | 10 | 7 | | | 3.2 | 285 | 5.3 | 497 | 7.4 | 708 |
| 3'–6" | 3'–2" | 2'–2" | | 10 | 7 | | | 3.4 | 305 | 5.7 | 528 | 7.9 | 747 |
| 4'–0" | 3'–8" | 2'–8" | | 12 | 9 | | | 3.7 | 326 | 6.0 | 559 | 8.4 | 786 |
| 4'–6" | 4'–2" | 3'–2" | | 12 | 9 | | | 3.9 | 334 | 6.4 | 571 | 8.8 | 803 |
| 5'–0" | 4'–8" | 3'–8" | | 14 | 11 | | | 4.1 | 354 | 6.7 | 602 | 9.3 | 844 |
| 5'–6" | 5'–2" | 4'–2" | 3'–5" | 16 | 13 | 15 | 6 | 4.4 | 375 | 6.0 | 607 | 7.4 | 850 |
| 6'–0" | 5'–8" | 4'–8" | 3'–11" | 16 | 13 | 16 | 6 | 4.6 | 382 | 6.2 | 616 | 7.6 | 860 |
| 6'–6" | 6'–2" | 5'–2" | 4'–5" | 18 | 15 | 18 | 8 | 4.8 | 402 | 6.4 | 637 | 7.8 | 880 |
| 7'–0" | 6'–8" | 5'–8" | 4'–11" | 20 | 17 | 19 | 10 | 5.0 | 423 | 6.6 | 654 | 8.0 | 897 |
| 7'–6" | 7'–2" | 6'–2" | 5'–5" | 20 | 17 | 20 | 10 | 5.3 | 430 | 6.9 | 664 | 8.3 | 907 |
| 8'–0" | 7'–8" | 6'–8" | 5'–11" | 22 | 19 | 22 | 12 | 5.5 | 451 | 7.1 | 684 | 8.5 | 927 |
| 8'–6" | 8'–2" | 7'–2" | 6'–5" | 24 | 21 | 23 | 14 | 5.7 | 471 | 7.3 | 702 | 8.7 | 944 |
| 9'–0" | 8'–8" | 7'–8" | 6'–11" | 24 | 21 | 24 | 14 | 6.0 | 479 | 7.6 | 711 | 9.0 | 954 |
| 9'–6" | 9'–2" | 8'–2" | 7'–5" | 26 | 23 | 26 | 16 | 6.2 | 499 | 7.8 | 732 | 9.2 | 974 |
| 10'–0" | 9'–8" | 8'–8" | 7'–11" | 28 | 25 | 27 | 18 | 6.4 | 520 | 8.0 | 749 | 9.4 | 992 |
| 10'–6" | 10'–2" | 9'–2" | 8'–5" | 28 | 25 | 28 | 18 | 6.7 | 527 | 8.3 | 759 | 9.7 | 1001 |
| 11'–0" | 10'–8" | 9'–8" | 8'–11" | 30 | 27 | 30 | 20 | 6.9 | 547 | 8.5 | 779 | 9.9 | 1022 |

NOTE: FOR L= 5', L= 10' AND L= 15'

REGULAR INLETS: TOTAL QUANTITIES NEEDED ARE OUTSIDE OF THE HEAVY BLACK LINE.

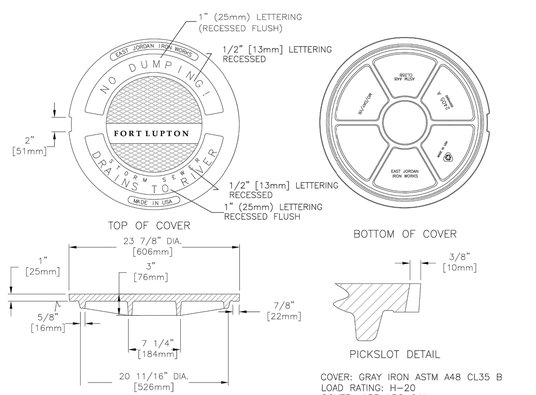
DROP BOX INLETS: TOTAL QUANTITIES NEEDED ARE INSIDE OF THE HEAVY BLACK LINE.

STEEL WEIGHTS DO NOT INCLUDE STRUCTURAL STEEL.




(3 OF 4)

| DESIGN STANDARDS | STANDARD DRAWING |
|---|---|
| CURB INLET TYPE R | ST7 |
| | DATE: 8/15/14 |




(4 OF 4)

| DESIGN STANDARDS | STANDARD DRAWING |
|---|---|
| CURB INLET TYPE R | ST8 |
| | DATE: 8/15/14 |

Know what's below. Call before you dig.

## ENGINEER'S STATEMENT

STANDARD DETAILS SHOWN WERE REVIEWED ONLY AS TO THEIR APPLICATION ON THIS PROJECT.

ANDREW J. HUGILL, PE
COLORADO LIC. PE NO. 57007
FOR AND ON BEHALF OF JR ENGINEERING, LLC.

DATE

UNTIL SUCH TIME AS THESE DOCUMENTS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, JR ENGINEERING APPROVES THEIR USE ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

PREPARED FOR
LUPTON LAND, LLC
10221 PRESTWICK TRAIL
LONE TREE, CO 80124
BOB QUINETTE
P–303.587.1966

J·R ENGINEERING
A Westrian Company
Centennial 303-740-9393 • Colorado Springs 719-593-2593
Fort Collins 970-491-9888 • www.jrengineering.com

| No. | REVISION | BY | DATE |
|---|---|---|---|
| | | | |

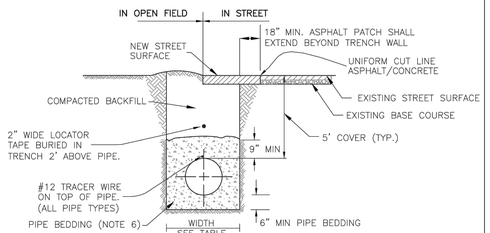
| H-SCALE | V-SCALE | DATE | DESIGNED BY | DRAWN BY | CHECKED BY |
|---|---|---|---|---|---|
| N/A | N/A | 12/13/21 | N/A | SWW | |

COYOTE CREEK FILING NO 4

DETAILS

SHEET 27 OF 46

JOB NO. 16093.00




## TYPICAL TRENCH SECTION

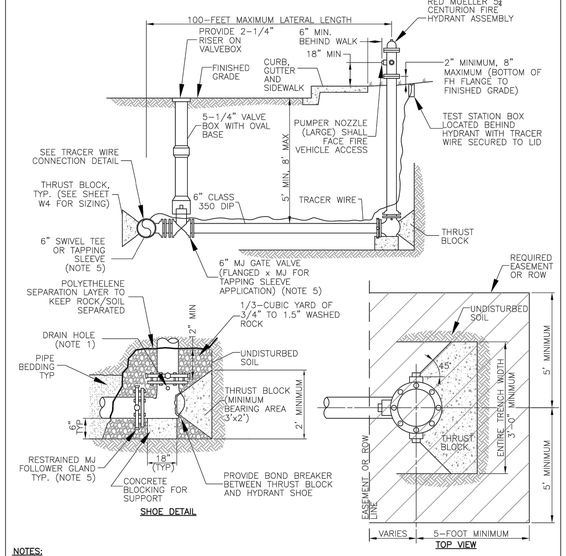
### TRENCH WIDTH

| PIPE DIAMETER | MINIMUM WIDTH | MAXIMUM WIDTH |
|---|---|---|
| 4" | 1'-4" | 2'-4" |
| 6" | 1'-6" | 2'-6" |
| 8" | 1'-8" | 2'-8" |
| 12" | 2'-0" | 3'-0" |
| 16" | 2'-4" | 3'-4" |
| 20" | 2'-8" | 3'-8" |
| 24" | 4'-0" | 5'-0" |

NOTES:

1. TRENCHES 5 FT DEEP OR GREATER REQUIRE A "PROTECTIVE SYSTEM" AS DEFINED BY OSHA. TRENCHES 20 FT DEEP OR GREATER REQUIRE THAT THE PROTECTIVE SYSTEM BE DESIGN BY A REGISTERED PROFESSIONAL ENGINEER.
2. OSHA'S STANDARDS REQUIRE THAT TRENCHES BE INSPECTED DAILY AND AS CONDITIONS CHANGE BY A "COMPETENT PERSON" (AS DEFINED BY OSHA) PRIOR TO WORKER ENTRY TO ENSURE ELIMINATION OF EXCAVATION HAZARDS. FOR ADDITIONAL INFORMATION REGARDING OSHA REQUIREMENTS CALL 1-800-321-OSHA.
3. MINIMUM COVER OVER PIPE TO BE BELOW OFFICIAL STREET GRADE.
4. FOR PIPE BEDDING REQUIREMENTS REFER TO CHAPTER 9 OF THE STANDARDS AND SPECIFICATIONS.
5. PIPE BEDDING SHALL BE PLACED AGAINST UNDISTURBED SOIL IN THE TRENCH BOTTOM, HOWEVER, WHERE ADVERSE SOIL IS ENCOUNTERED IN THE TRENCH BOTTOM, SOIL SHALL BE REMOVED AND TRENCH STABILIZATION MATERIAL SHALL BE PLACED IN ACCORDANCE WITH THE RECOMMENDATIONS OF A GEOTECHNICAL ENGINEER.

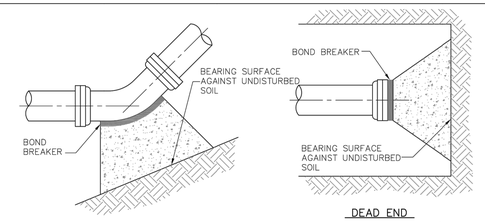
| DESIGN STANDARDS | STANDARD DRAWING |
|---|---|
| TYPICAL TRENCH SECTION PIPE PROTECTION | W1 |
| | DATE: 8/15/14 |




NOTES:

1. ALL FITTINGS, DI PIPE, AND HYDRANT BARREL SHALL BE POLYETHYLENE WRAPPED PER AWWA C-105. PROVIDE PERFORATION AT HYDRANT DRAIN HOLES.
2. PRIOR TO PUTTING INTO SERVICE THE FOLLOWING SHALL BE PERFORMED: NOZZLE THREADS SHALL BE GREASED, OIL RESERVOIR SHALL BE FILLED, AND HYDRANTS SHALL BE BRUSH PAINTED FIRE ENGINE RED (#7407).
3. THE ENTIRE PIPING ASSEMBLY (HYDRANT SHOE TO CONNECTION AT MAIN) SHALL BE FULLY RESTRAINED.

| DESIGN STANDARDS | STANDARD DRAWING |
|---|---|
| FIRE HYDRANT INSTALLATION DETAIL | W2 |
| | DATE: 8/15/14 |




TYPICAL PIPE/THRUST BLOCK CROSS SECTION

MINIMUM BEARING SURFACE AREA

(IN SQUARE FEET)

| SIZE OF PIPE | BENDS | | | | TEE OR DEAD END |
|---|---|---|---|---|---|
| | 11 1/4° | 22 1/2° | 45° | 90° | |
| 4" | 1.0 | 2.0 | 3.0 | 6.0 | 4.0 |
| 6" | 2.0 | 3.0 | 6.0 | 11.0 | 8.0 |
| 8" | 3.0 | 6.0 | 11.0 | 19.0 | 14.0 |
| 12" | 6.0 | 12.0 | 22.0 | 40.0 | 29.0 |
| 16" | 10.0 | 20.0 | 38.0 | 70.0 | 50.0 |
| 20" | 15.0 | 30.0 | 59.0 | 108.0 | 46.0 |
| 24" | 22.0 | 43.0 | 84.0 | 154.0 | 110.0 |

NOTES:

1. BEARING SURFACES SHOWN IN CHART ARE MINIMUM.
2. BEARING SURFACES ARE BASED ON 150 PSI INTERNAL PIPE \ PRESS PLUS WATER HAMMER.
   4", 6", 8" AND 12" WATER HAMMER = 110 PSI
   16", 20" AND 24" WATER HAMMER = 70 PSI
3. BEARING SURFACE CALCULATIONS ARE BASED ON 900 PSF SOIL BEARING CAPACITY.
4. ALL DUCTILE IRON AND CAST IRON PIPE AND FITTINGS SHALL BE WRAPPED IN POLYETHYLENE AND SECURELY TAPED PRIOR TO PLACING TRUST BLOCKS.
5. NO COMPACTION SHALL BE ALLOWED ABOVE THRUST BLOCKS FOR A MINIMUM OF 24 HOURS AFTER PLACEMENT. CONCRETE MUST CURE A MIN. OF 48 HOURS PRIOR TO FILLING LINES.

| DESIGN STANDARDS | STANDARD DRAWING |
|---|---|
| CONCRETE THRUST BLOCKS - BEARING SURFACES AND INSTALLATION | W3 |
| | DATE: 8/15/14 |

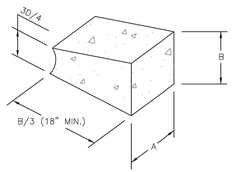
### MINIMUM DIMENSIONS FOR THRUST BLOCKS

| FITTING SIZE | TEES & PLUGS | | 90° BEND | | 45° BENDS & WYES | |
|---|---|---|---|---|---|---|
| | A | B | A | B | A | B |
| 4" | 1'-7" | 1'-2" | 1'-9" | 1'-6" | 1'-8" | 0'-10" |
| 6" | 2'-0" | 1'-11" | 2'-5" | 2'-2" | 1'-10" | 1'-7" |
| 8" | 2'-8" | 2'-6" | 3'-2" | 3'-0" | 2'-5" | 2'-1" |
| 10" | 3'-4" | 3'-3" | 4'-0" | 3'-10" | 3'-0" | 2'-9" |
| 12" | 4'-0" | 3'-10" | 4'-8" | 4'-8" | 3'-8" | 3'-3" |
| 14" | 5'-8" | 3'-10" | 6'-6" | 4'-11" | 4'-9" | 3'-5" |
| 20" | 5'-0" | 5'-0" | 6'-0" | 6'-0" | 5'-0" | 4'-0" |
| 24" | 6'-0" | 6'-0" | 7'-0" | 7'-0" | 5'-0" | 5'-0" |
| 30" | 7'-6" | 7'-6" | 8'-0" | 8'-0" | 6'-3" | 6'-3" |

| FITTING SIZE | REDUCERS & 22 1/2° BENDS | | 11 1/4° BENDS | |
|---|---|---|---|---|
| | A | B | A | B |
| 4" | 1'-7" | 0'-6" | 0'-6" | 0'-6" |
| 6" | 1'-9" | 0'-10" | 1'-0" | 0'-6" |
| 8" | 1'-9" | 1'-6" | 1'-0" | 1'-0" |
| 10" | 2'-2" | 1'-11" | 1'-6" | 1'-0" |
| 12" | 2'-7" | 2'-3" | 2'-0" | 1'-0" |
| 14" | 3'-5" | 2'-5" | 2'-0" | 1'-6" |
| 20" | 3'-6" | 3'-0" | 3'-0" | 2'-0" |
| 24" | 4'-6" | 3'-0" | 3'-0" | 3'-0" |
| 30" | 4'-9" | 4'-6" | 3'-3" | 3'-3" |

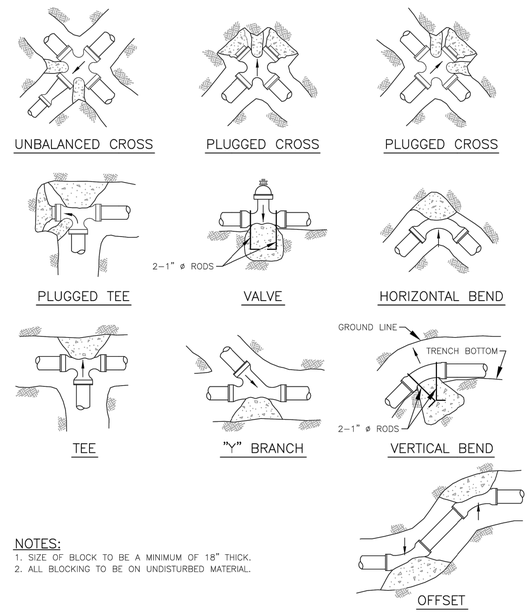
GENERAL NOTES:

1. BEARING SURFACE AREAS SHOWN IN CHART ARE MINIMUM.
2. BASED ON 150 P.S.I. INTERNAL PIPE PRESSURE.
3. SOIL BEARING CAPACITY = 2000 LB./SQ. FT.
4. ALL FITTINGS TO BE WRAPPED WITH POLYETHYLENE (MINIMUM 8 MIL.).




NOT TO SCALE

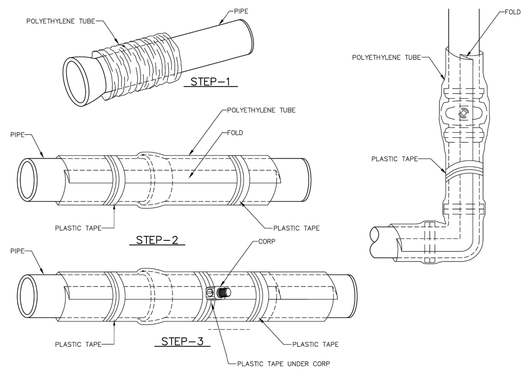
| DESIGN STANDARDS | STANDARD DRAWING |
|---|---|
| TYPICAL TRENCH BLOCK DIMENSIONS | W4 |
| | DATE: 8/15/14 |




NOTES:

1. SIZE OF BLOCK TO BE A MINIMUM OF 18" THICK.
2. ALL BLOCKING TO BE ON UNDISTURBED MATERIAL.

| DESIGN STANDARDS | STANDARD DRAWING |
|---|---|
| CONCRETE THRUST BLOCK FOR UNBALANCED SURFACES | W5 |
| | DATE: 8/15/14 |




FIELD INSTALLATION-POLYETHYLENE WRAP

STEP-1 PLACE TUBE OF POLYETHYLENE MATERIAL AROUND PIPE PRIOR TO LOWERING PIPE INTO TRENCH.

STEP-2 PULL THE TUBE OVER THE LENGTH OF THE PIPE. TAPE TUBE TO PIPE AT JOINT. FOLD MATERIAL AROUND THE ADJACENT SPIGOT END AND WRAP WITH TAPE TO HOLD THE PLASTIC TUBE IN PLACE.

STEP-3 OVERLAP FIRST TUBE WITH ADJACENT TUBE AND SECURE WITH PLASTIC ADHESIVE TAPE. THE POLYETHYLENE TUBE MATERIAL COVERING THE PIPE SHALL BE LOOSE. EXCESS MATERIAL SHALL BE NEATLY DRAWN UP AROUND THE PIPE BARREL, FOLDED ON TOP OF THE PIPE AND TAPED IN PLACE.

NOTE: POLYETHYLENE SHALL BE MINIMUM 8-MIL THICKNESS

| DESIGN STANDARDS | STANDARD DRAWING |
|---|---|
| POLYETHYLENE WRAP | W6 |
| | DATE: 8/15/14 |

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## ENGINEER'S STATEMENT

STANDARD DETAILS SHOWN WERE REVIEWED ONLY AS TO THEIR APPLICATION ON THIS PROJECT.

ANDREW J. HUGILL, PE
COLORADO LIC. PE NO. 57007
FOR AND ON BEHALF OF JR ENGINEERING, LLC.

DATE

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PREPARED FOR
LUPTON LAND, LLC
10221 PRESTWICK TRAIL
LONE TREE, CO 80124
BOB QUINETTE
P-303.587.1966

J·R ENGINEERING
A Westrian Company
Centennial 303-740-9393 • Colorado Springs 719-593-2593
Fort Collins 970-491-9888 • www.jrengineering.com

| No. | REVISION | BY | DATE |
|---|---|---|---|

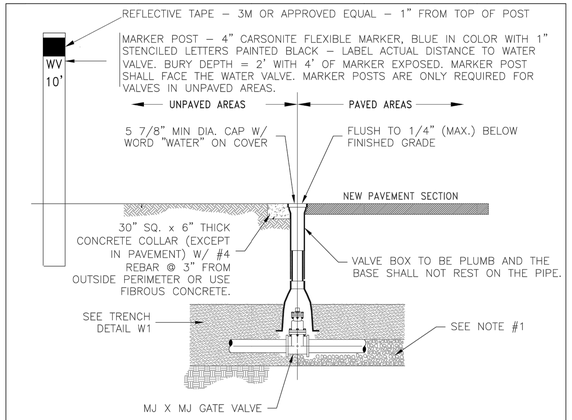
| | |
|---|---|
| H-SCALE | N/A |
| V-SCALE | N/A |
| DATE | 12/13/21 |
| DESIGNED BY | N/A |
| DRAWN BY | SWW |
| CHECKED BY | |

COYOTE CREEK FILING NO 4

DETAILS

SHEET 28 OF 46

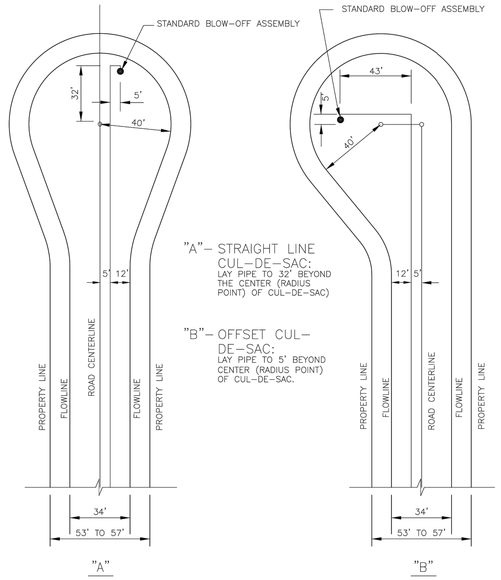
JOB NO. 16093.00




NOTES:

1. CARE SHALL BE TAKEN WHEN INSTALLING VALVES TO ASSURE PROPER SUPPORT OF THE VALVE. THE CITY ENGINEER MAY REQUIRE 3/4" CRUSHED ROCK TO BE INSTALLED UNDER THE VALVE TO PROVIDE PROPER SUPPORT.
2. VALVES SHALL NOT BE PLACED IN CONCRETE SIDEWALKS, CROSS PANS, GUTTERS, OR OTHER DRAINAGE WAYS.
3. OPERATING NUTS OR EXTENSIONS SHALL NOT BE SET CLOSER THAN TWO (2) FEET FROM FINAL GRADE. IF THE OPERATING NUT IS DEEPER THAN FIVE (5) FEET FROM FINAL GRADE, PROVIDE A 1 1/4" EXTENSION SHAFT W/ CENTERING RING. OPERATOR EXTENSIONS SHALL BE CONNECTED TO THE VALVE OPERATOR NUT USING A PIN. THE EXTENSION SHAFT SHALL INCLUDE A 1/4" THICK TRASH RING LOCATED 6" BELOW THE NON-RISING PORTION OF THE VALVE BOX. THE DIAMETER OF THE TRASH RING SHALL BE 1/8" LESS THAN THE INSIDE DIAMETER OF THE VALVE BOX.
4. GATE VALVE SHALL BE POLYETHYLENE WRAPPED (8 MIL).
5. CONCRETE COLLARS & MARKER POSTS ARE REQUIRED WHEN VALVE IS LOCATED IN AN UNPAVED AREA.
6. VALVE BOXES ARE TO BE BROUGHT UP TO GRADE AT THE TIME OF PAVEMENT PLACEMENT OR OVERLAY. VALVE BOX ADJUSTING RINGS ARE NOT ALLOWED.

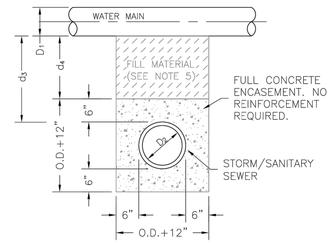
| DESIGN STANDARDS | STANDARD DRAWING |
|---|---|
| VALVE BOX | W1 |
| | DATE: 8/15/14 |




"A"– STRAIGHT LINE CUL–DE–SAC: LAY PIPE TO 32' BEYOND THE CENTER (RADIUS POINT) OF CUL–DE–SAC)

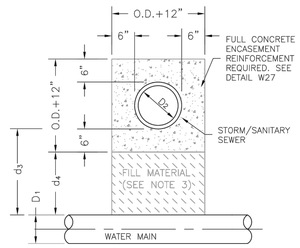
"B"– OFFSET CUL–DE–SAC: LAY PIPE TO 5' BEYOND CENTER (RADIUS POINT) OF CUL–DE–SAC.

| DESIGN STANDARDS | STANDARD DRAWING |
|---|---|
| WATER DISTRIBUTION SYSTEM TYPICAL PLAN FOR CUL-DE-SAC | W21 |
| | DATE: 8/15/14 |




STORM OR SANITARY SEWER CROSSING UNDER WATER MAIN

IF $d_3$ >18" AN ENCASEMENT IS NOT REQUIRED



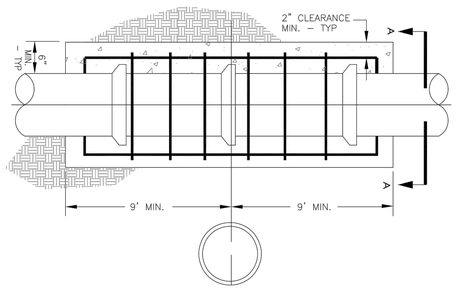

NOTES:

1. CONCRETE TO BE CAST AGAINST UNDISTURBED SOIL OR SHORING.
2. LENGTH OF ENCASEMENT SHALL EXTEND AT LEAST 9–FEET EACH SIDE OF WATER MAIN.
3. FILLER MATERIAL BETWEEN CONDUITS TO BE APPROVED COMPRESSIBLE MATERIAL SUCH AS STYROFOAM, ETC. IF d4≤6". COMPACTED BACKFILL, IF d4>6".
4. SHORING OR SHEETING, IF USED, TO BE CUT OFF AT TOP OF ENCASEMENT
5. A REINFORCED ENCASEMENT IS REQUIRED FOR ALL CONDUITS CROSSING OVER WATERMAINS BUT ENCASEMENTS ARE NOT REQUIRED TO BE REINFORCED IF CROSSING UNDER WATERMAINS.

STORM OR SANITARY SEWER CROSSING OVER TOP OF WATER MAIN

REINFORCED ENCASEMENT REQUIRED REGARDLESS OF DIMENSION $d_3$

| DESIGN STANDARDS | STANDARD DRAWING |
|---|---|
| ENCASEMENT FOR CONDUIT CROSSING | W26 |
| | DATE: 8/15/14 |




| PIPE I.D. | NO. OF LONGITUDINAL BARS & LOCATION |
|---|---|
| 6" TO 8" | 4 – #4 BARS 1 EACH CORNER |
| 10" TO 18" | 8 – #4 BARS 3 EACH SIDE |
| 21" TO 33" | 12 – #4 BARS 4 EACH SIDE |
| 36" | 16 – #4 BARS 5 EACH SIDE |

| DESIGN STANDARDS | STANDARD DRAWING |
|---|---|
| CONCRETE ENCASEMENT REINFORCEMENT DETAIL | W27 |
| | DATE: 8/15/14 |

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## ENGINEER'S STATEMENT

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ANDREW J. HUGILL, PE
COLORADO LIC. PE NO. 57007
FOR AND ON BEHALF OF JR ENGINEERING, LLC.

DATE

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PREPARED FOR
LUPTON LAND, LLC
10221 PRESTWICK TRAIL
LONE TREE, CO 80124
BOB QUINETTE
P–303.587.1966

J·R ENGINEERING
A Westrian Company
Centennial 303-740-9393 • Colorado Springs 719-593-2593
Fort Collins 970-491-9888 • www.jrengineering.com

| No. | REVISION | BY | DATE |
|---|---|---|---|
| | | | |

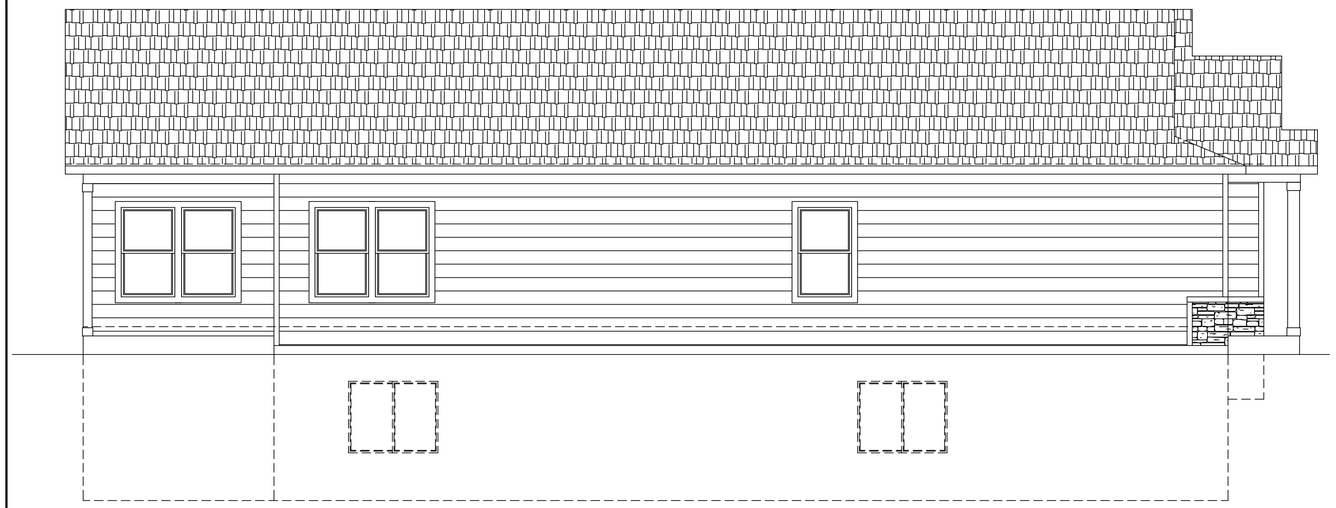
| | |
|---|---|
| H-SCALE | N/A |
| V-SCALE | N/A |
| DATE | 12/13/21 |
| DESIGNED BY | N/A |
| DRAWN BY | SWW |
| CHECKED BY | |

COYOTE CREEK FILING NO 4

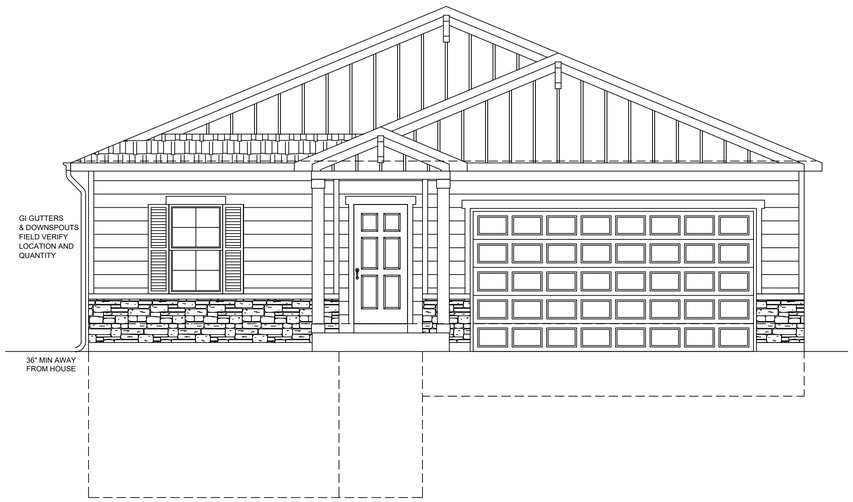
DETAILS

SHEET 29 OF 46

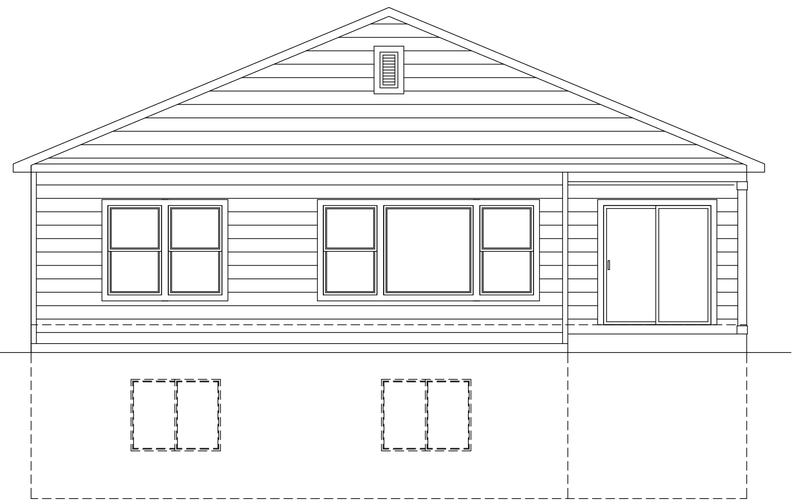
JOB NO. 16093.00



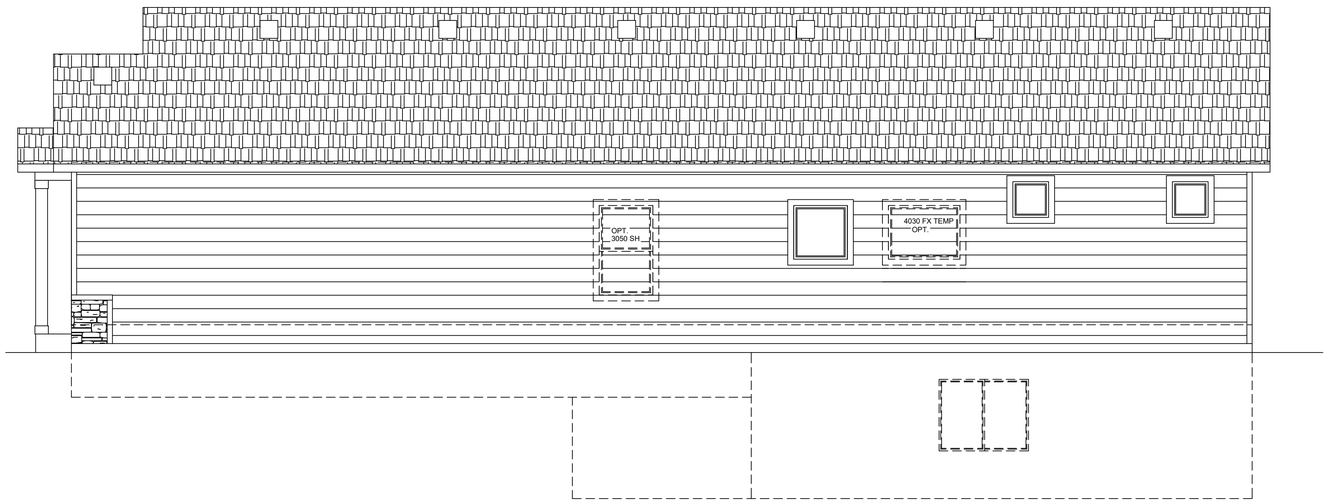
SIDE ELEVATION
1/4"=1'-0"




D1812.1 FRONT ELEVATION-TRADITIONAL
1/4"=1'-0"



REAR ELEVATION
1/4"=1'-0"




GARAGE SIDE ELEVATION
1/4"=1'-0"

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SUITE 250
COLORADO SPRINGS, CO 80920
719-598-5192

SHEET NAME
ELEVATION- TRADITIONAL

PROJECT NAME
MASTER PLAN D1813.1

STAMPS/ENDORSEMENTS

DRAWN BY:
AL

DATE:
8/27/18

SUBMITTALS / REVISIONS

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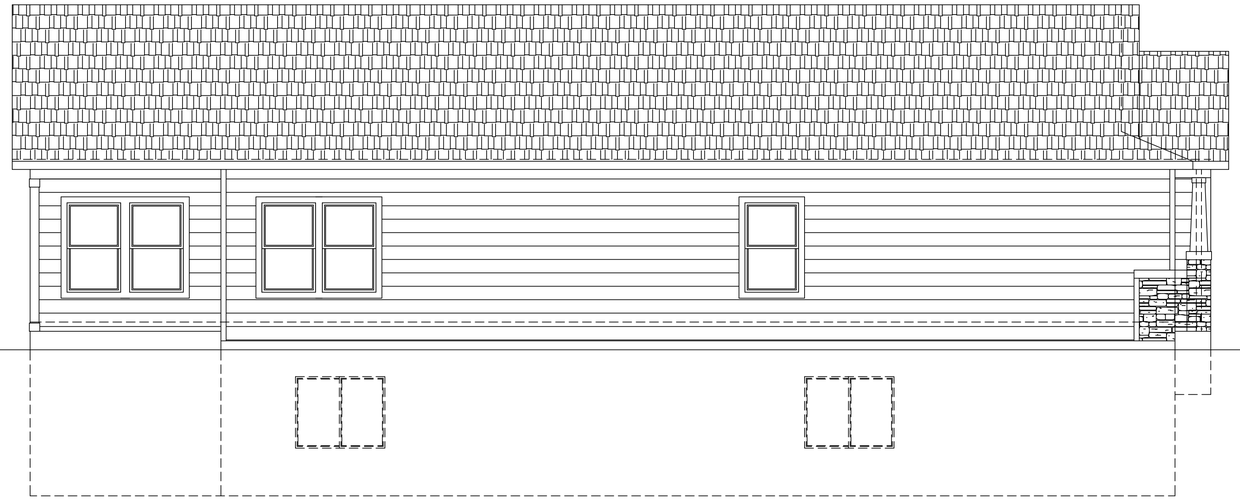
|---|---|---|
| | | |

SUBMITTALS / REVISIONS

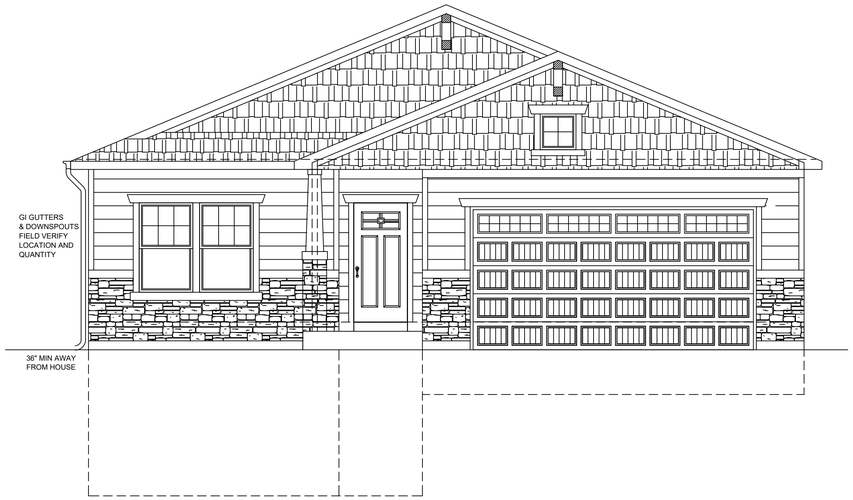
| BY | TYPE | DATE |
|---|---|---|
| | | |

ELEVATION TRAD

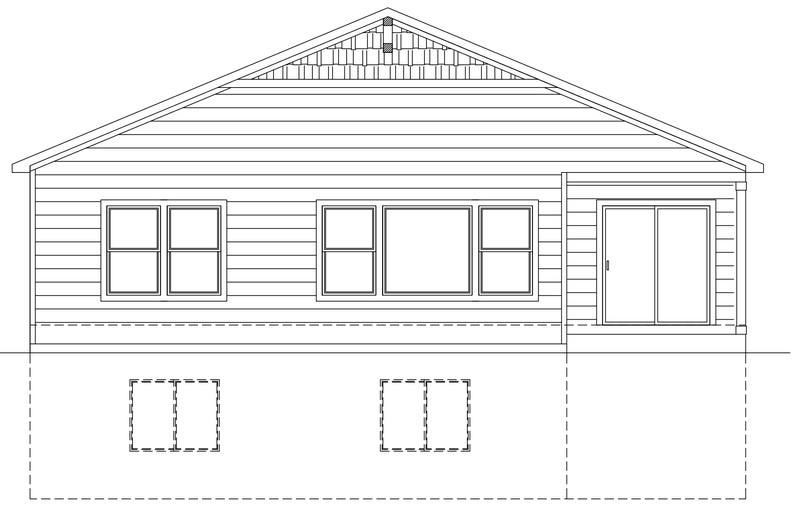
SHEET NUMBER
30



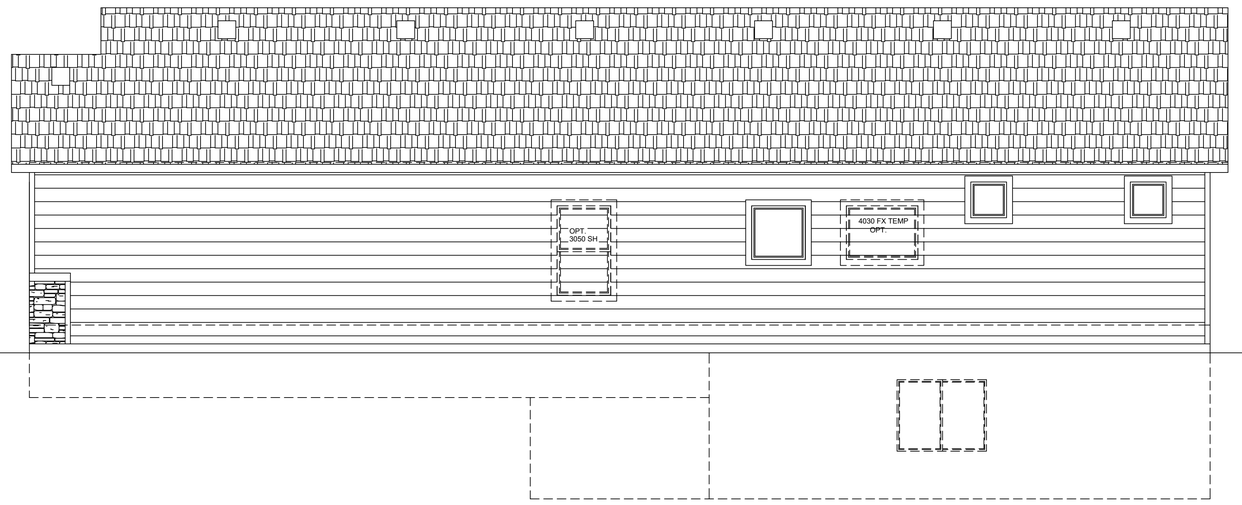
SIDE ELEVATION
1/4"=1'-0"




D1813.1 FRONT ELEVATION- CRAFTSMAN
1/4"=1'-0"



REAR ELEVATION
1/4"=1'-0"




GARAGE SIDE ELEVATION
1/4"=1'-0"

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COLORADO SPRINGS, CO 80920
719-598-5192

SHEET NAME
ELEVATION- CRAFTSMAN

PROJECT NAME
MASTER PLAN D1813.1

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|---|---|---|

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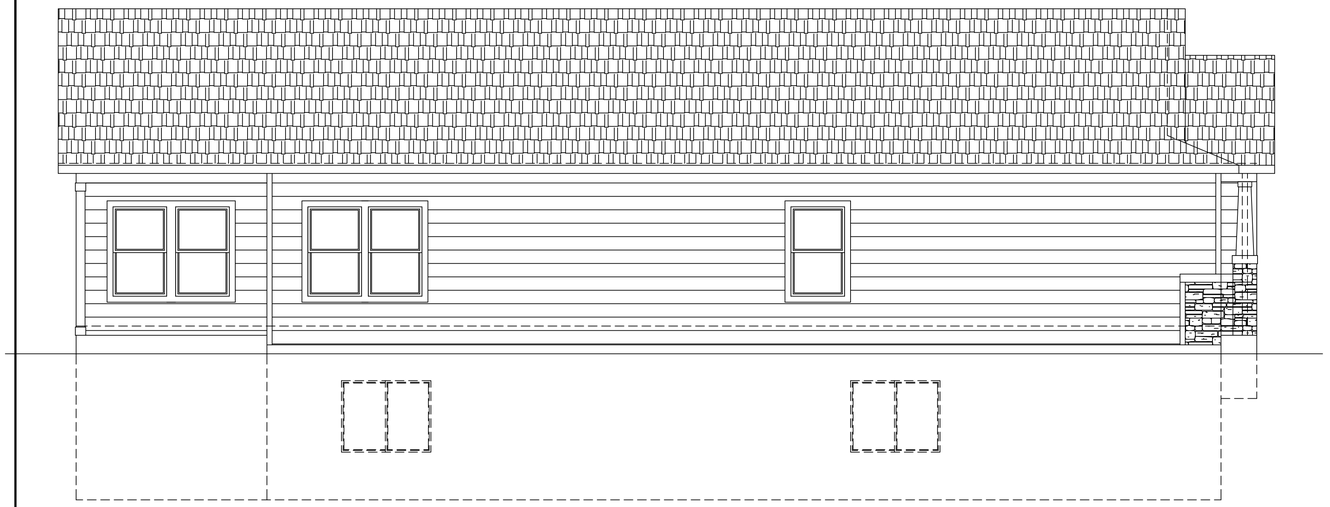
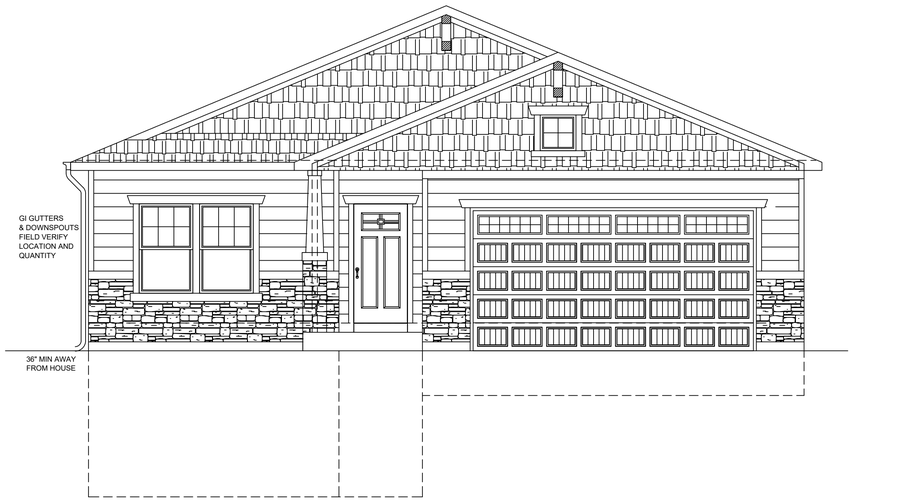
|---|---|---|

ELEVATION CRAFT.

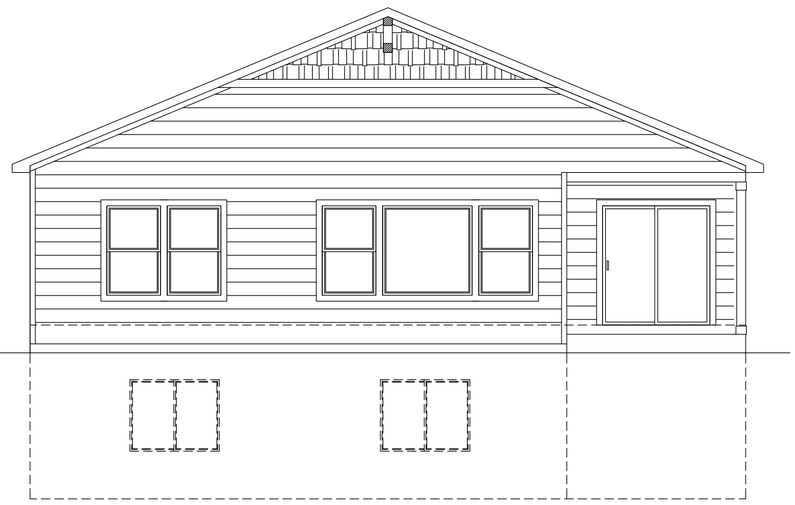
SHEET NUMBER
31



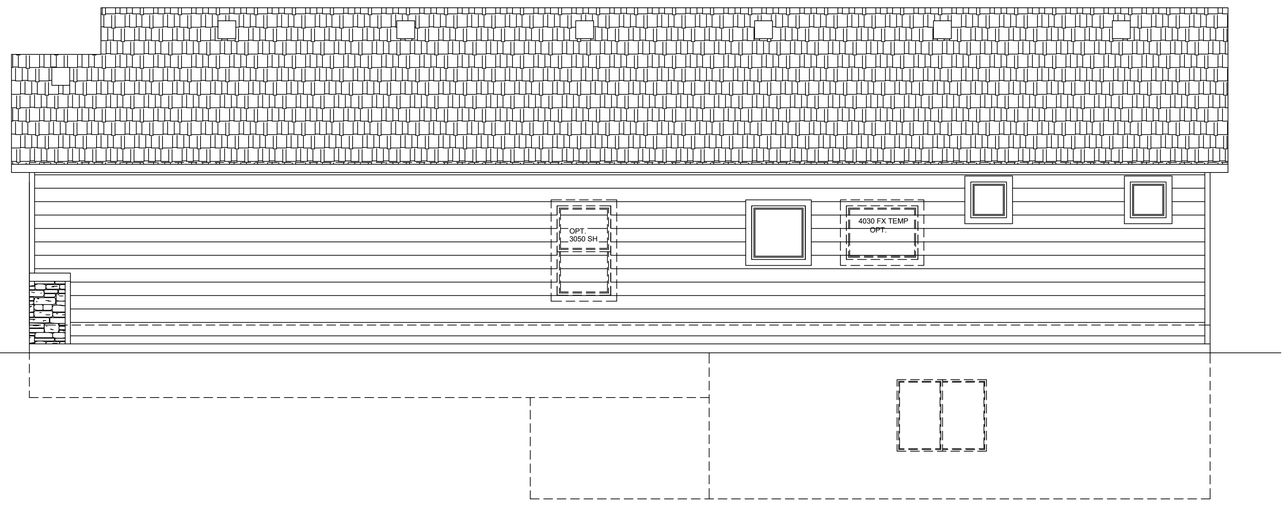
SIDE ELEVATION
1/4"=1'-0"




D1813.1 FRONT ELEVATION- CRAFTSMAN
1/4"=1'-0"



REAR ELEVATION
1/4"=1'-0"




GARAGE SIDE ELEVATION
1/4"=1'-0"

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719-598-5192

SHEET NAME
ELEVATION- CRAFTSMAN

PROJECT NAME
MASTER PLAN D1813.1

STAMPS/ENDORSEMENTS

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8/27/18

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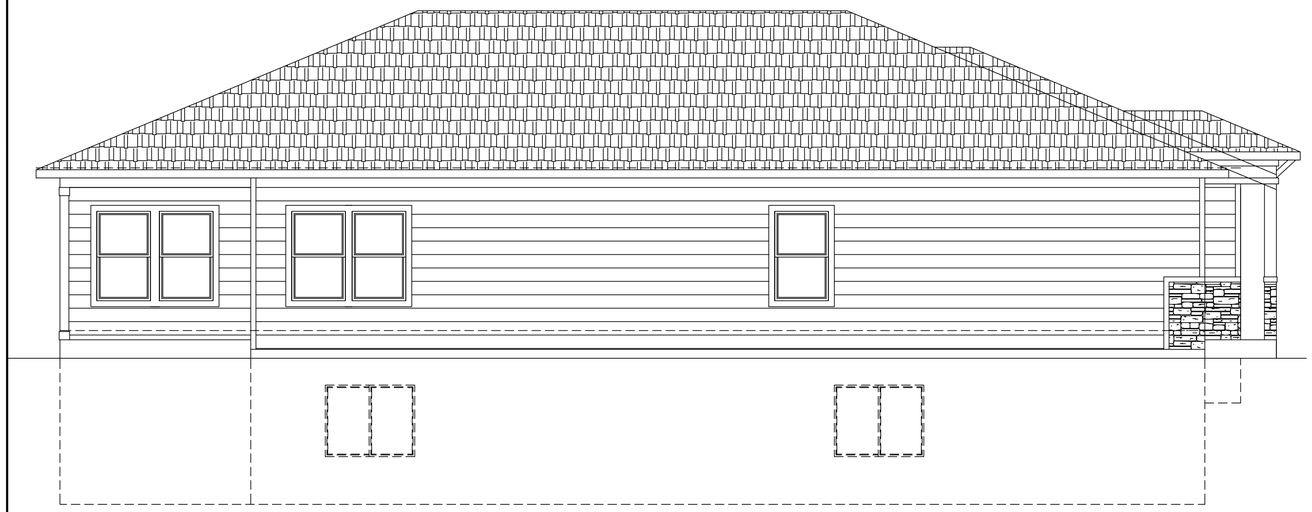
|---|---|---|
| | | |

SUBMITTALS / REVISIONS

| DATE | TYPE | BY |
|---|---|---|
| | | |

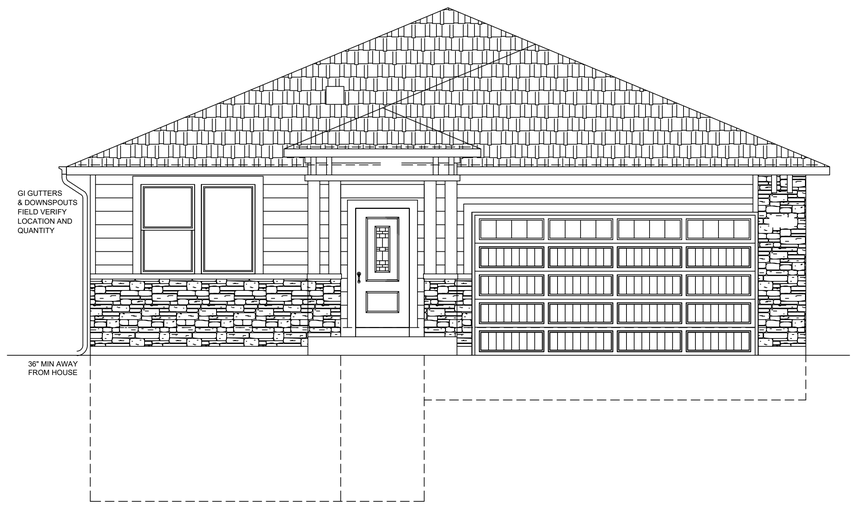
ELEVATION CRAFT.

SHEET NUMBER
32



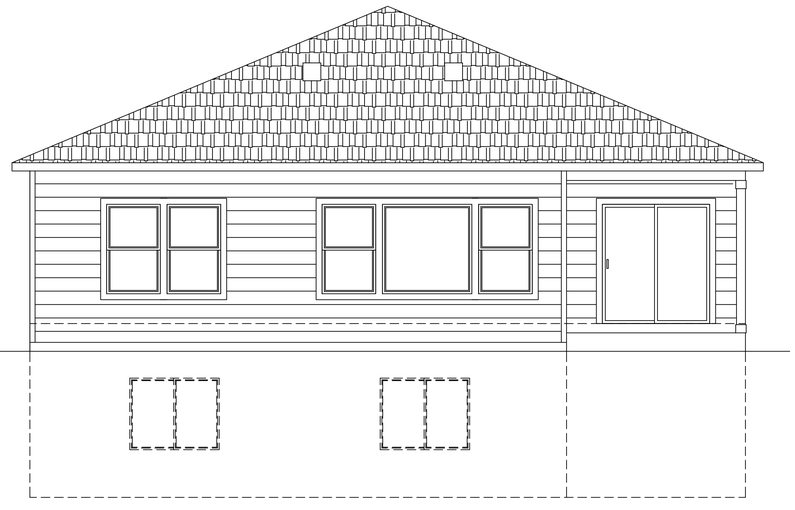
SIDE ELEVATION

1/4"=1'-0"



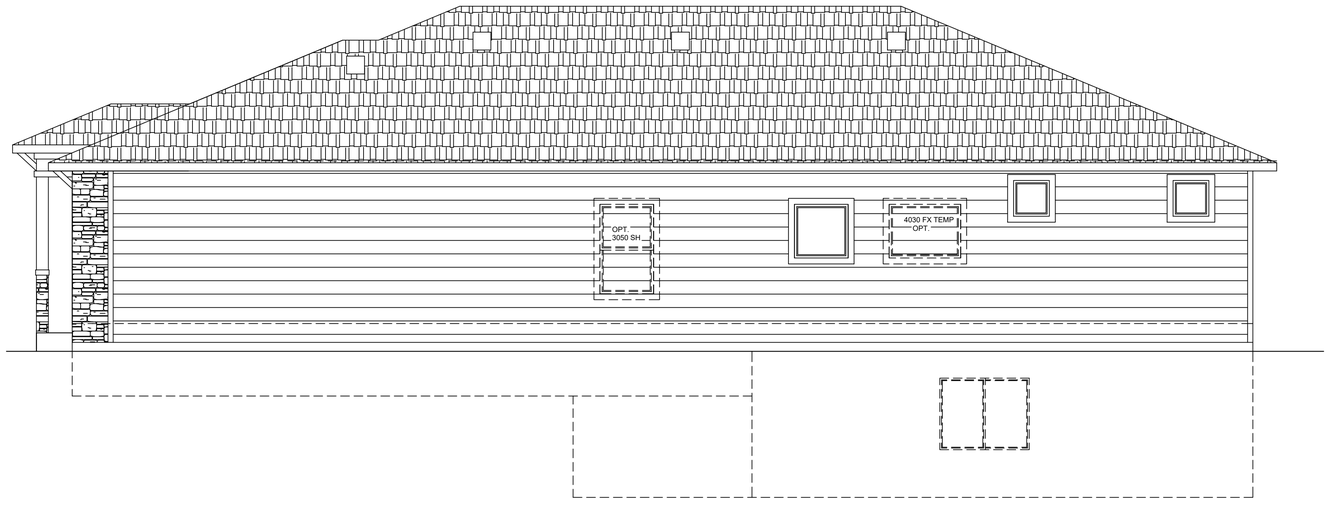

D1813.1 FRONT ELEVATION- MODERN PRAIRIE

1/4"=1'-0"



REAR ELEVATION

1/4"=1'-0"




GARAGE SIDE ELEVATION

1/4"=1'-0"

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SHEET NAME
ELEVATION- MODERN PRAIRIE

PROJECT NAME
MASTER PLAN D1813.1

STAMPS/ENDORSEMENTS

DRAWN BY:
AL

DATE:
8/27/18

SUBMITTALS / REVISIONS

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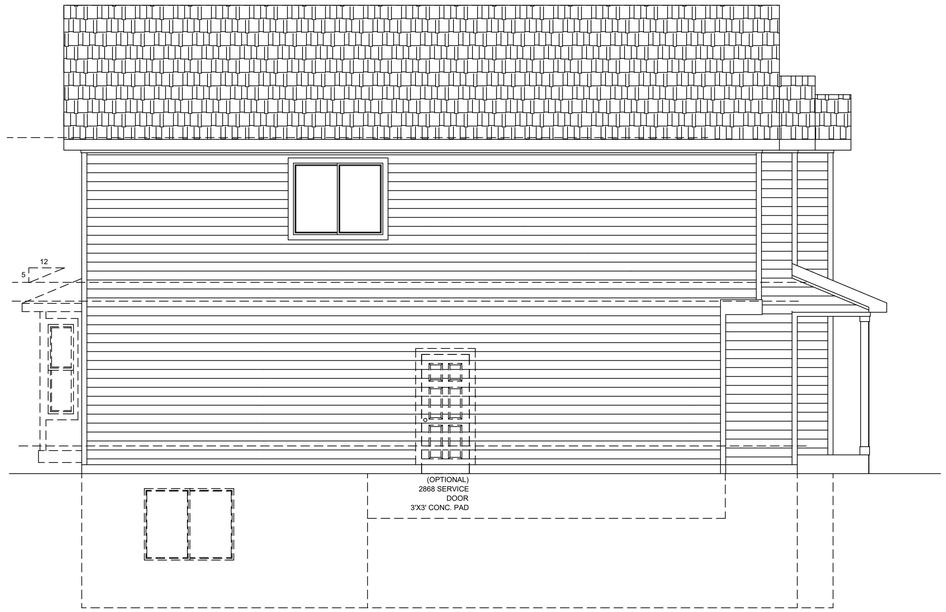
| | | |

SUBMITTALS / REVISIONS

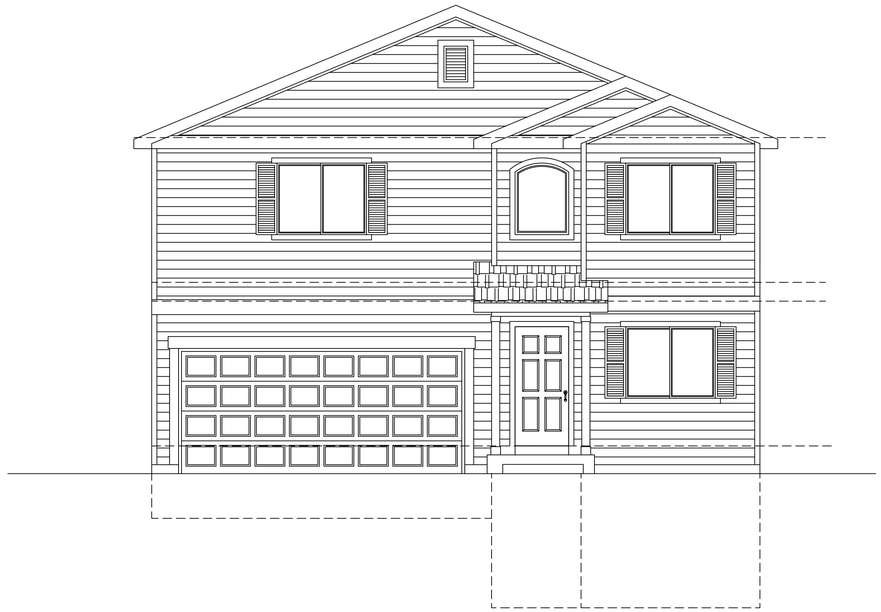
| BY | TYPE | DATE |
|---|---|---|
| | | |

ELEVATION MOD. PR.

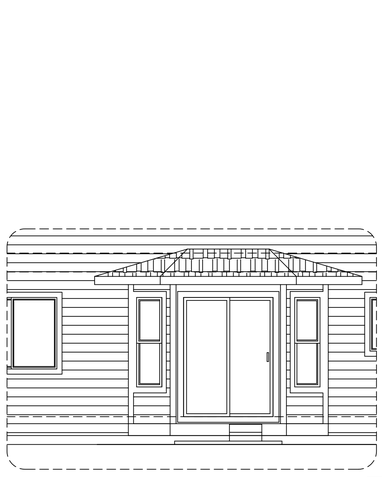
SHEET NUMBER
33



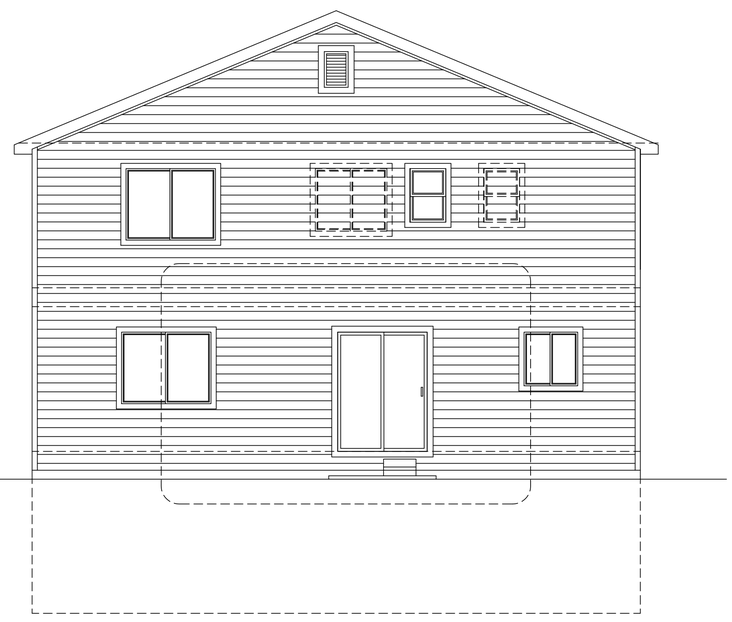

GARAGE SIDE ELEVATION "A"
1/4"=1'-0"



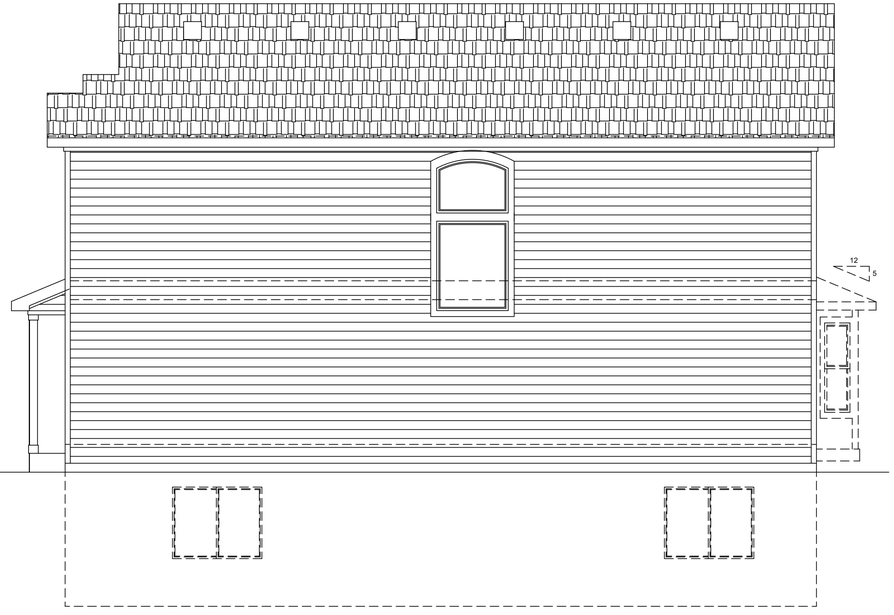
D2146.7 FRONT ELEVATION "A"
1/4"=1'-0"



OPT BAY AT DINING
1/4"=1'-0"



REAR ELEVATION "A"
1/4"=1'-0"




SIDE ELEVATION "A"
1/4"=1'-0"

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719-598-5192

SHEET NAME
ELEVATION- "A"

PROJECT NAME
MASTER PLAN D2146.7

STAMPS/ENDORSEMENTS

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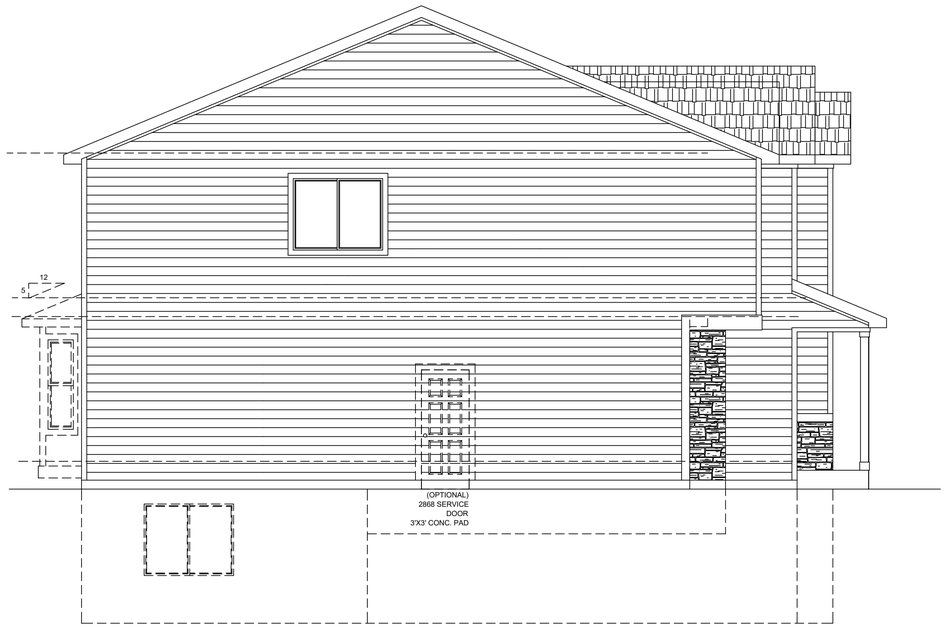
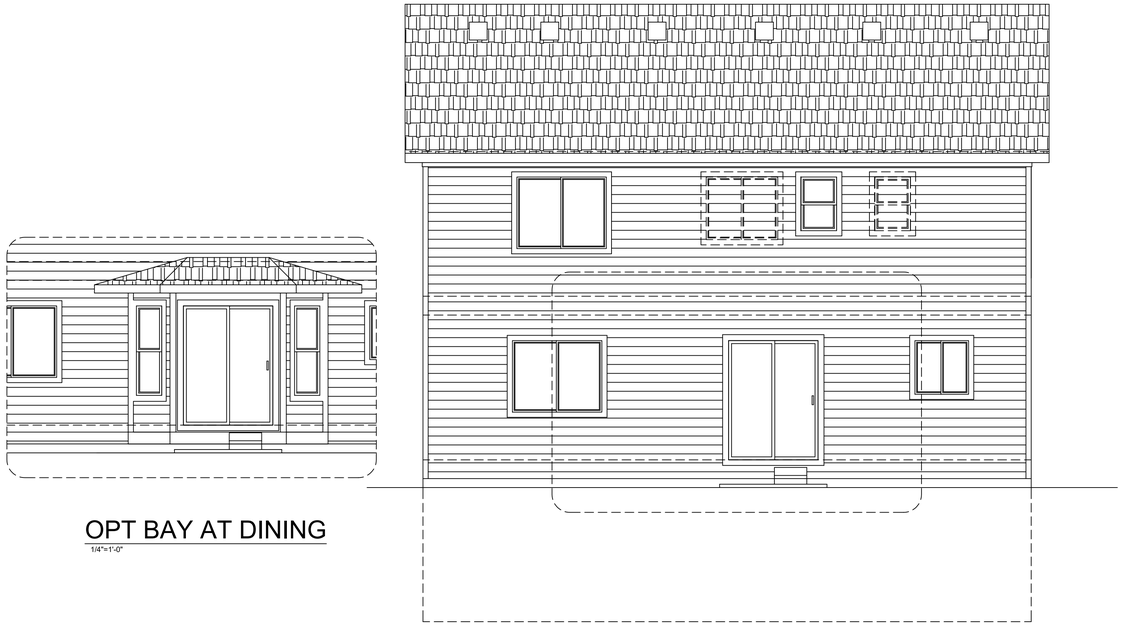
ELEVATION ELEV "A"

SHEET NUMBER
34



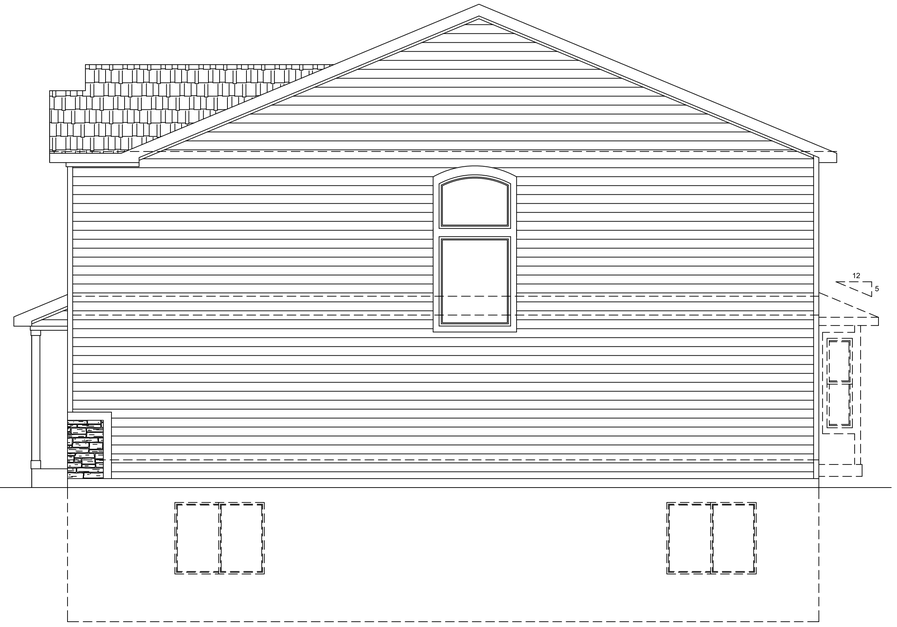

GARAGE SIDE ELEVATION "C"
1/4"=1'-0"

D2146.7 FRONT ELEVATION "C"
1/4"=1'-0"



OPT BAY AT DINING
1/4"=1'-0"

REAR ELEVATION "C"
1/4"=1'-0"




SIDE ELEVATION "C"
1/4"=1'-0"

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SHEET NAME
ELEVATION- "C"

PROJECT NAME
MASTER PLAN D2146.7

STAMPS/ENDORSEMENTS

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| BY | TYPE | DATE |
|---|---|---|
| | | |

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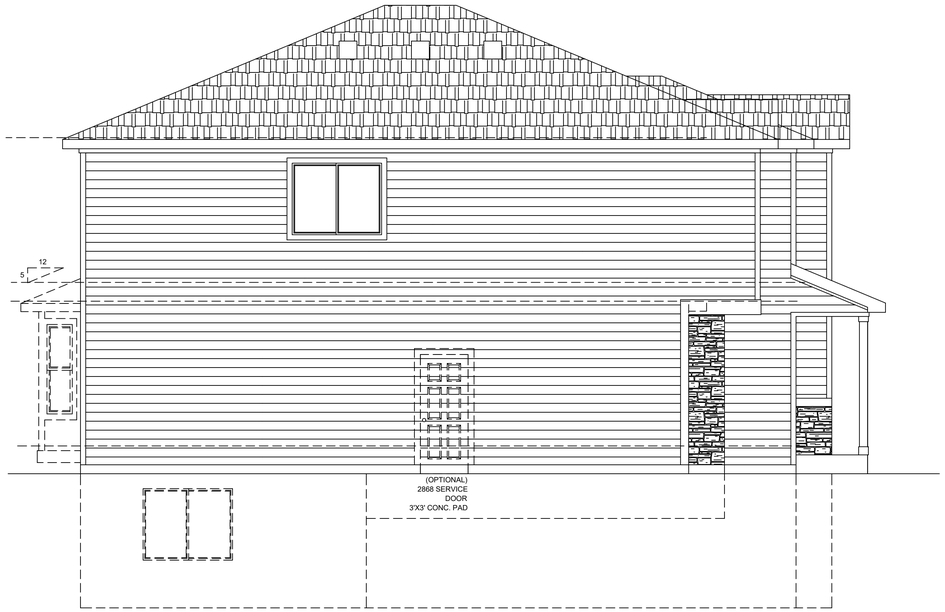
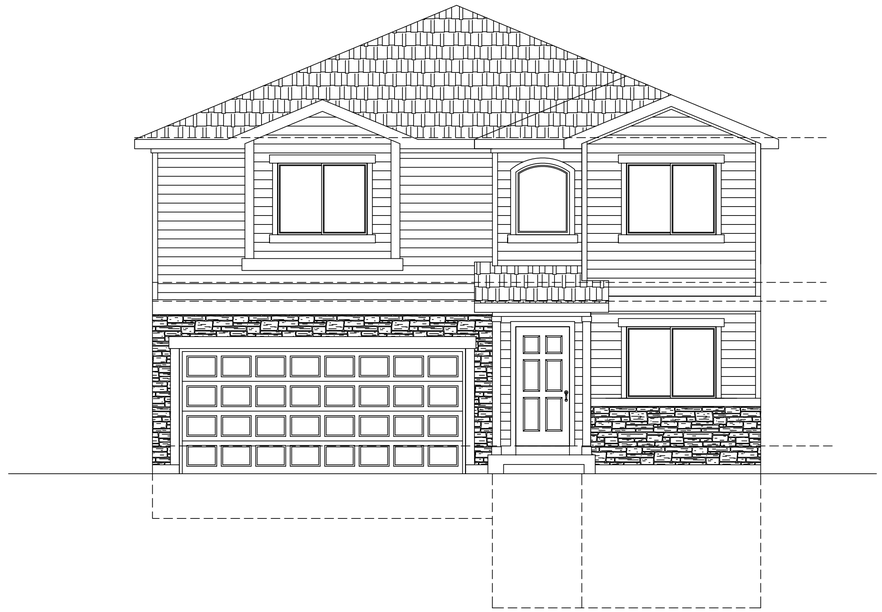
|---|---|---|
| | | |

ELEVATION ELEV "C"

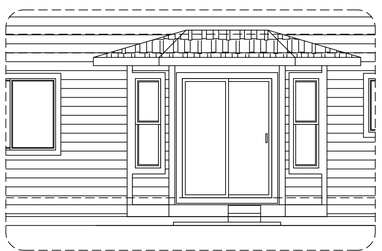
SHEET NUMBER
35



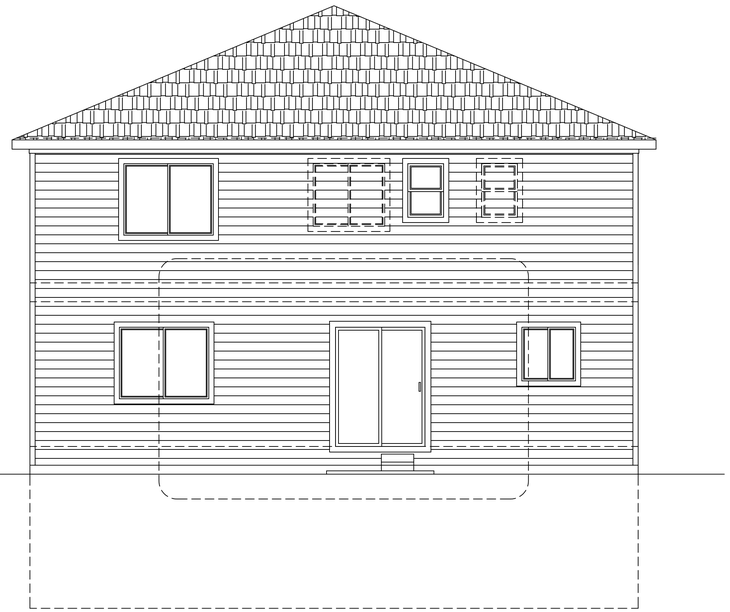

GARAGE SIDE ELEVATION "D"
1/4"=1'-0"



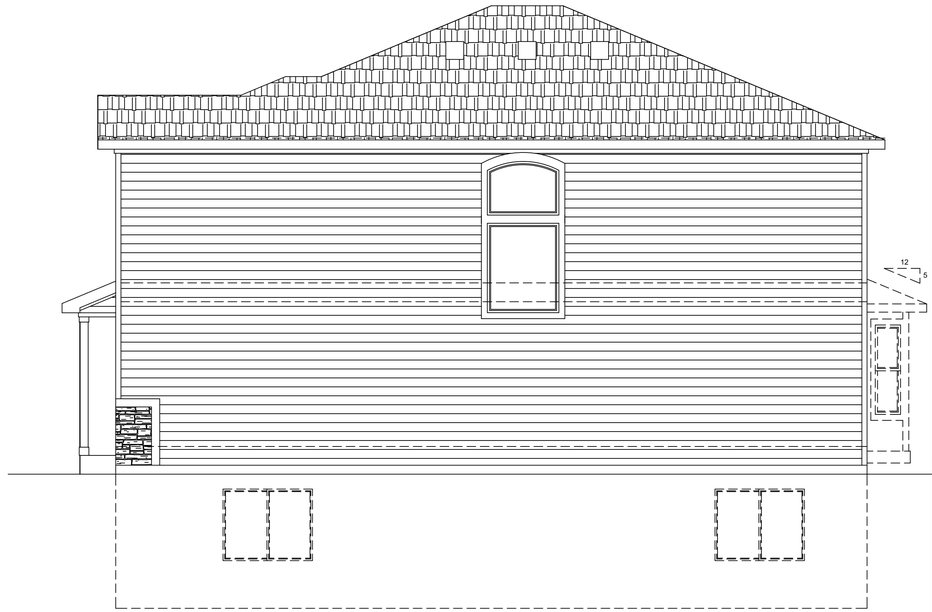
D2146.7 FRONT ELEVATION "D"
1/4"=1'-0"



OPT BAY AT DINING
1/4"=1'-0"



REAR ELEVATION "D"
1/4"=1'-0"




SIDE ELEVATION "D"
1/4"=1'-0"

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SHEET NAME
ELEVATION- "D"

PROJECT NAME
MASTER PLAN D2146.7

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| BY | TYPE | DATE |
|---|---|---|
| | | |

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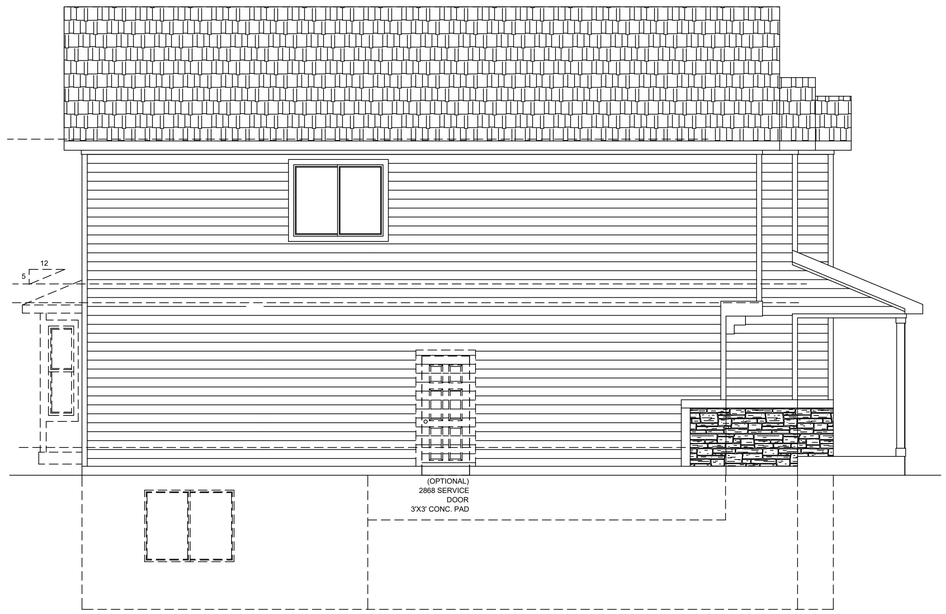
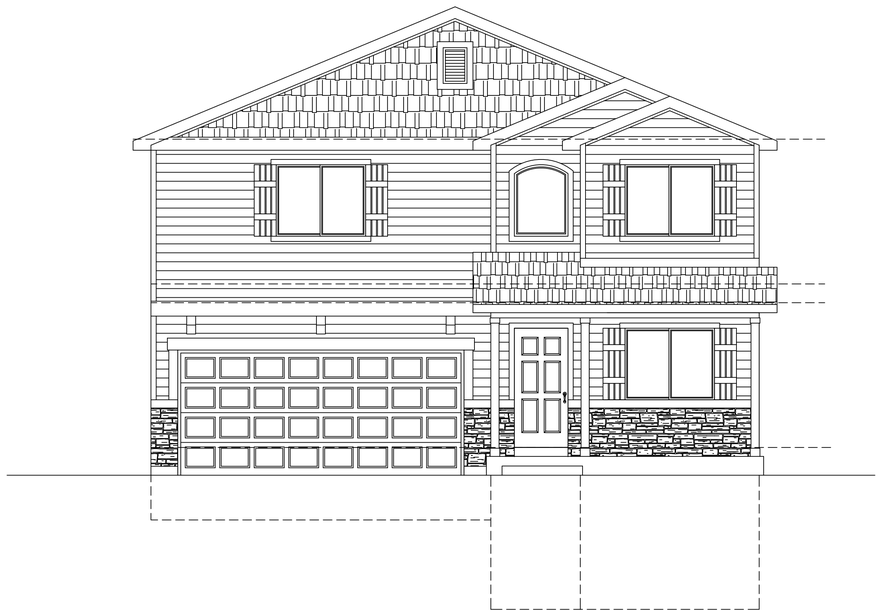
| BY | TYPE | DATE |
|---|---|---|
| | | |

ELEVATION ELEV "D"

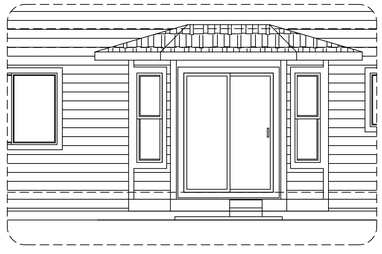
SHEET NUMBER
36



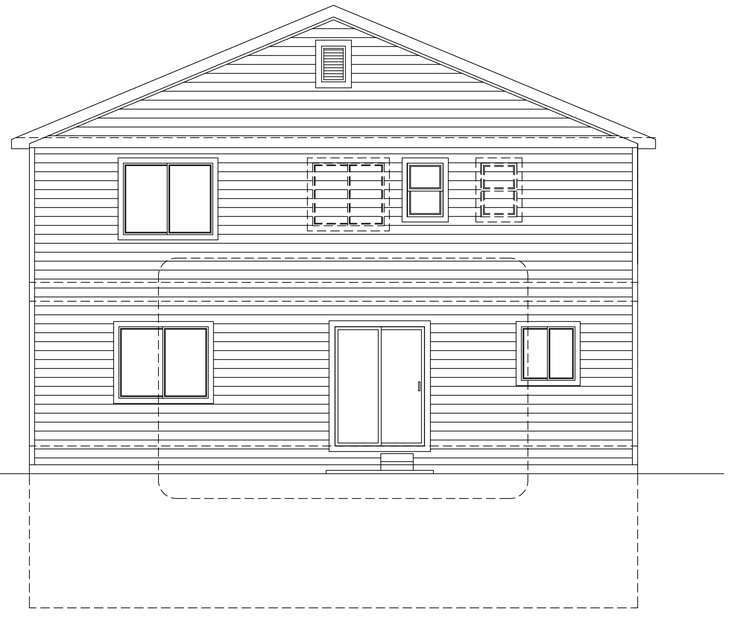

GARAGE SIDE ELEVATION "E"
1/4"=1'-0"



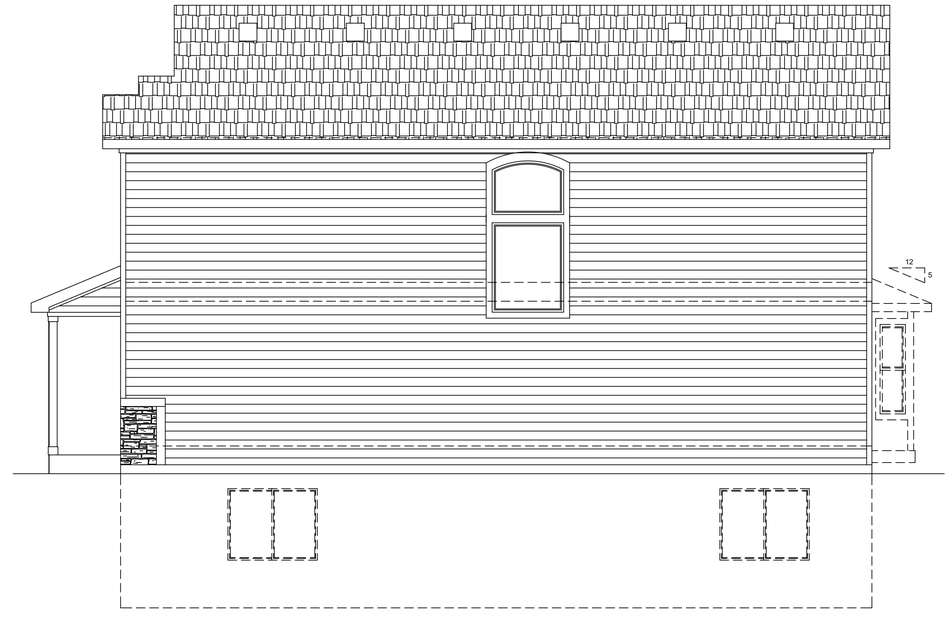
D2146.7 FRONT ELEVATION "E"
1/4"=1'-0"



OPT BAY AT DINING
1/4"=1'-0"



REAR ELEVATION "E"
1/4"=1'-0"




SIDE ELEVATION "E"
1/4"=1'-0"

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SHEET NAME
ELEVATION- "E"

PROJECT NAME
MASTER PLAN D2146.7

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| BY | TYPE | DATE |
|---|---|---|
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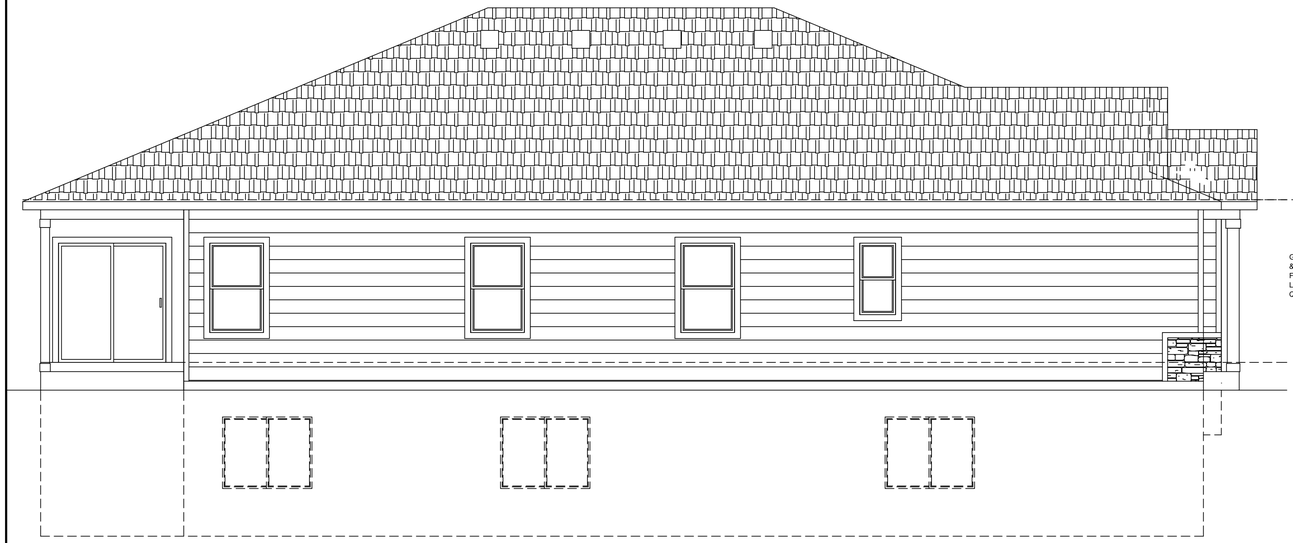
| BY | TYPE | DATE |
|---|---|---|
| | | |

ELEVATION ELEV "E"

SHEET NUMBER
37

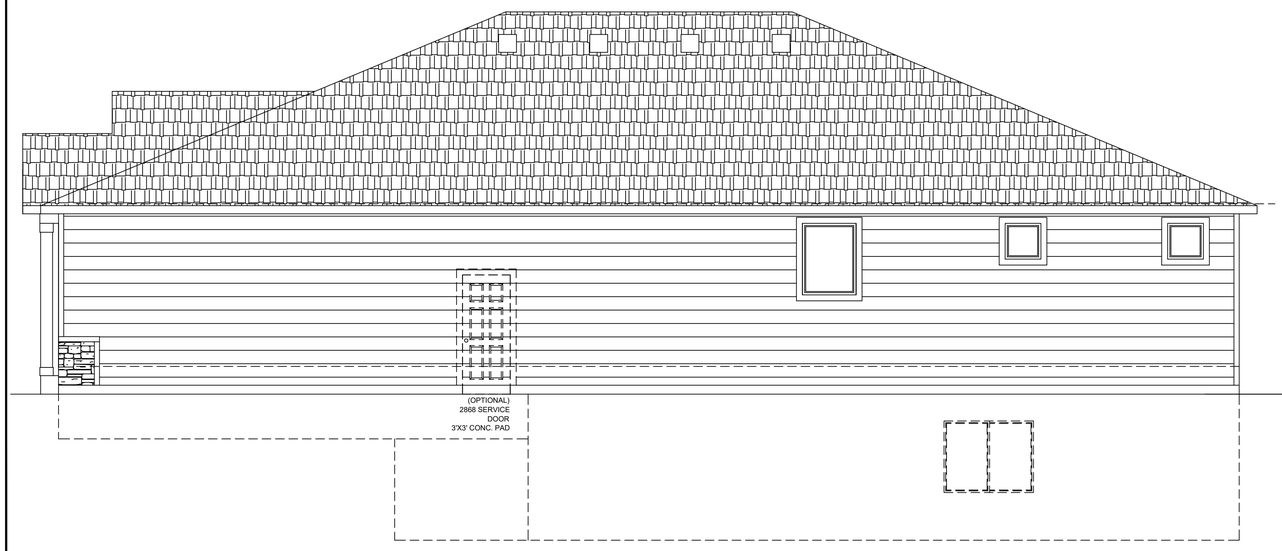


D2357.1 SIDE ELEVATION- TRADITIONAL

1/4"=1'-0"

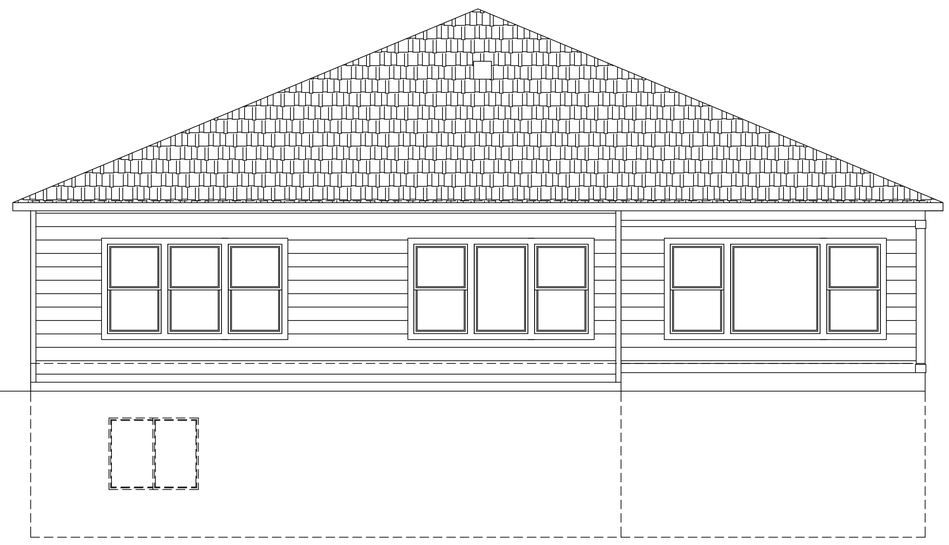
D2357.1 FRONT ELEVATION-TRADITIONAL

1/4"=1'-0"




GARAGE SIDE ELEVATION- TRADITIONAL

1/4"=1'-0"



REAR ELEVATION- TRADITIONAL

1/4"=1'-0"

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SHEET NAME
ELEVATION- TRADITIONAL

PROJECT NAME
MASTER PLAN D2357.1

STAMPS/ENDORSEMENTS

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DATE:
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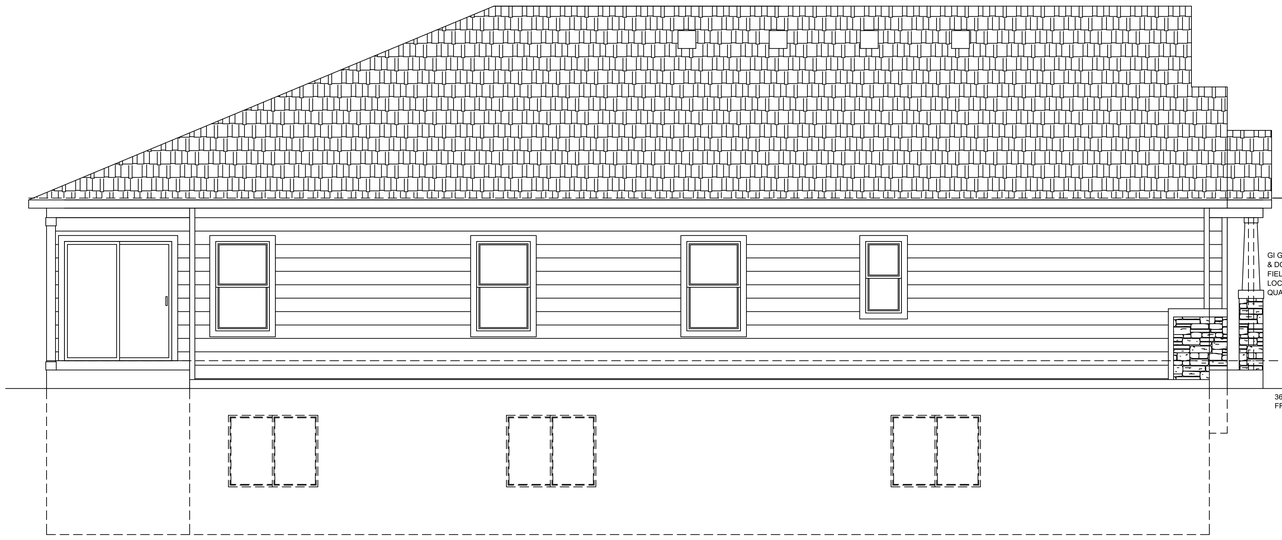
| BY | TYPE | DATE |
|---|---|---|
| | | |

SUBMITTALS / REVISIONS

| BY | TYPE | DATE |
|---|---|---|
| | | |

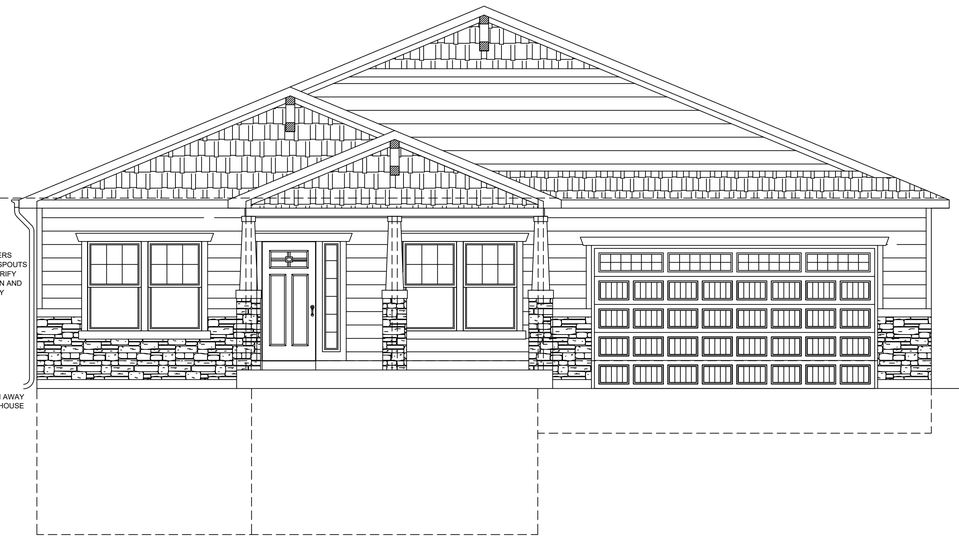
ELEVATION TRAD.

SHEET NUMBER
38



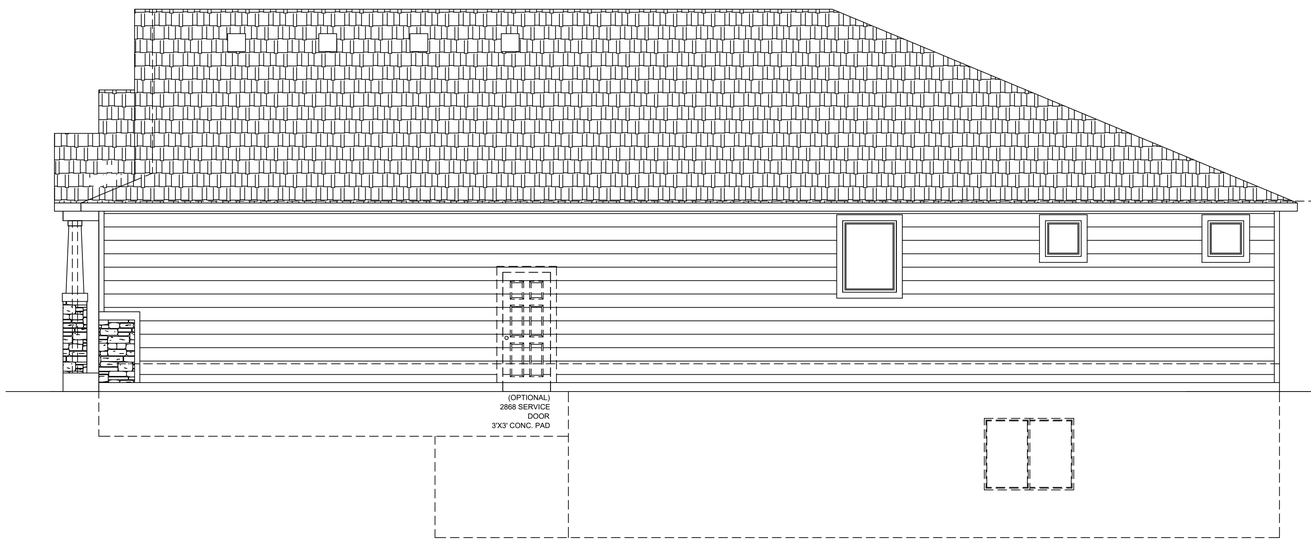

D2357.1 SIDE ELEVATION- CRAFTSMAN

1/4"=1'-0"



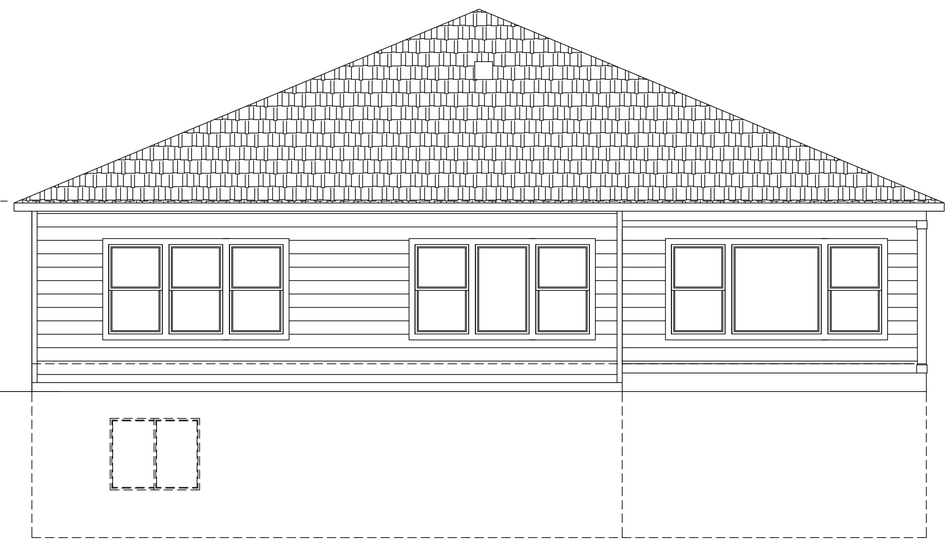
D2357.1 FRONT ELEVATION-CRAFTSMAN

1/4"=1'-0"




GARAGE SIDE ELEVATION- CRAFTSMAN

1/4"=1'-0"



REAR ELEVATION- CRAFTSMAN

1/4"=1'-0"

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SHEET NAME
ELEVATION- CRAFTSMAN

PROJECT NAME
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STAMPS/ENDORSEMENTS

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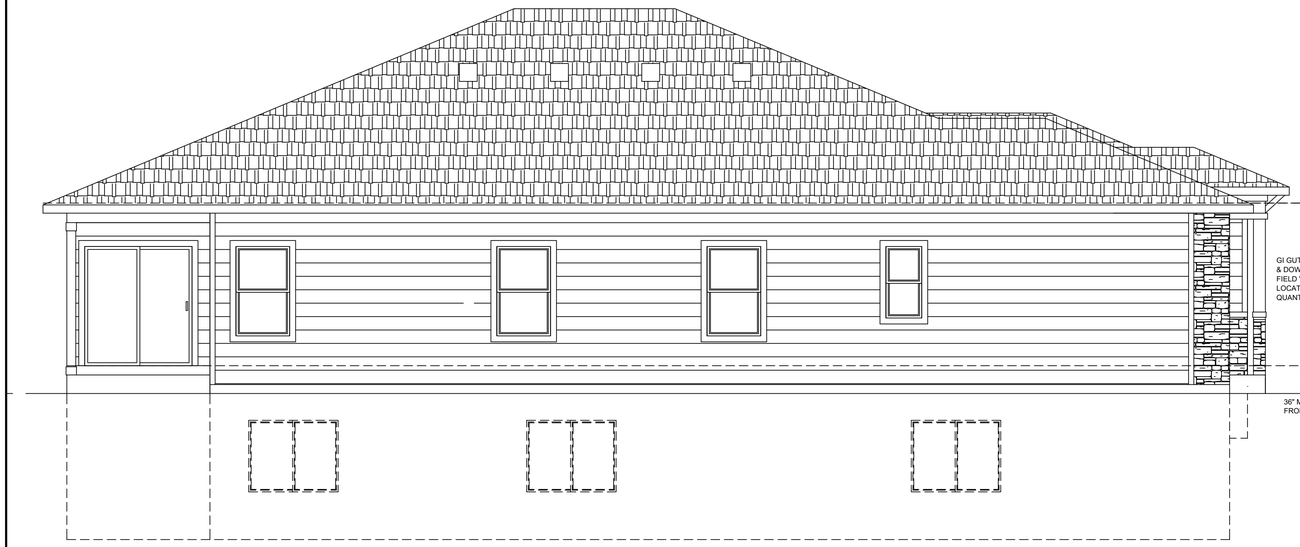
| BY | TYPE | DATE |
|---|---|---|
| | | |

SUBMITTALS / REVISIONS

| BY | TYPE | DATE |
|---|---|---|
| | | |

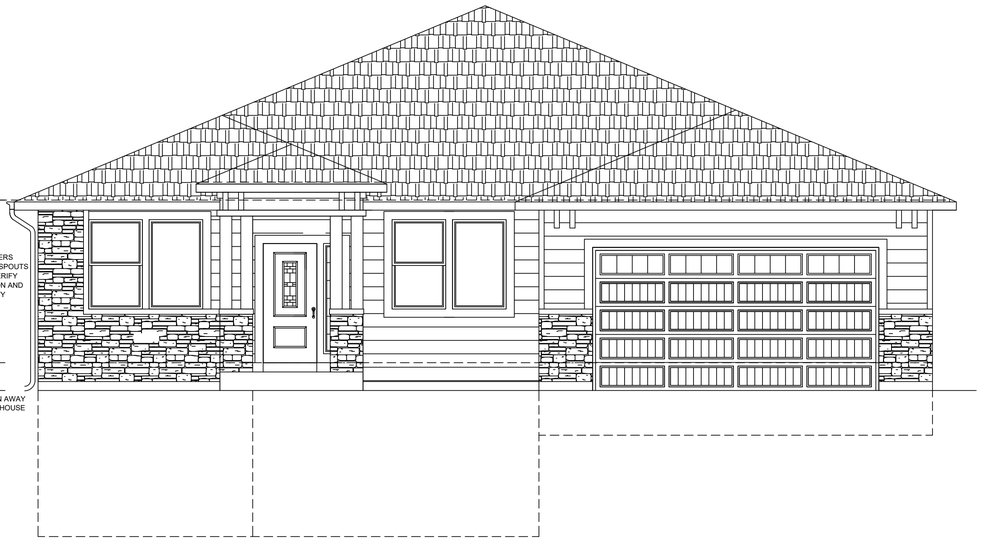
ELEVATION CRAFT.

SHEET NUMBER
39



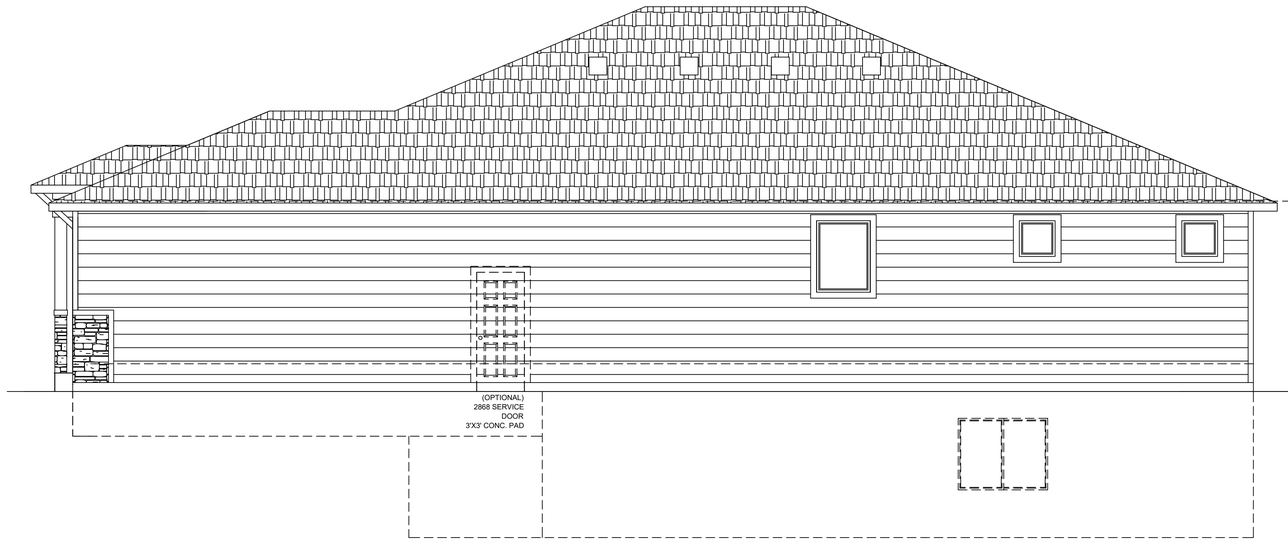

D2357.1 SIDE ELEVATION- MODERN PRAIRIE

1/4"=1'-0"



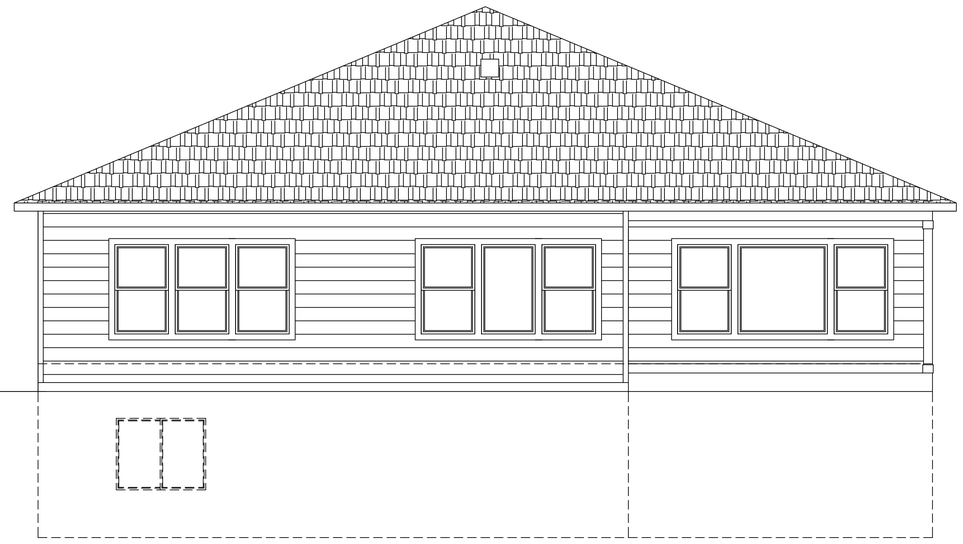
D2357.1 FRONT ELEVATION-MODERN PRAIRIE

1/4"=1'-0"




GARAGE SIDE ELEVATION- MODERN PRAIRIE

1/4"=1'-0"



REAR ELEVATION- MODERN PRAIRIE

1/4"=1'-0"

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SHEET NAME
ELEVATION- MODERN PRAIRIE

PROJECT NAME
MASTER PLAN D2357.1

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| BY | TYPE | DATE |
|---|---|---|
| | | |

SUBMITTALS / REVISIONS

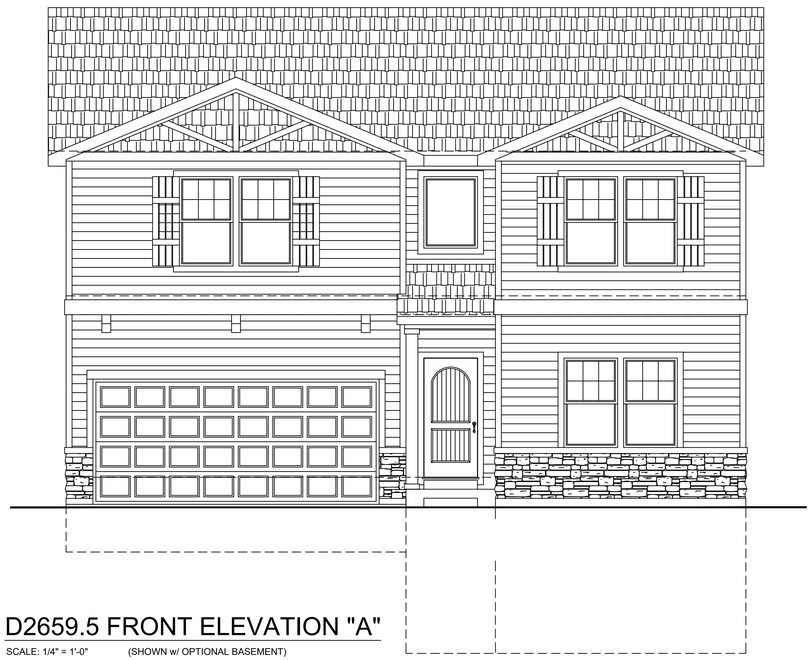
| BY | TYPE | DATE |
|---|---|---|
| | | |

ELEVATION MOD. PR.

SHEET NUMBER
40

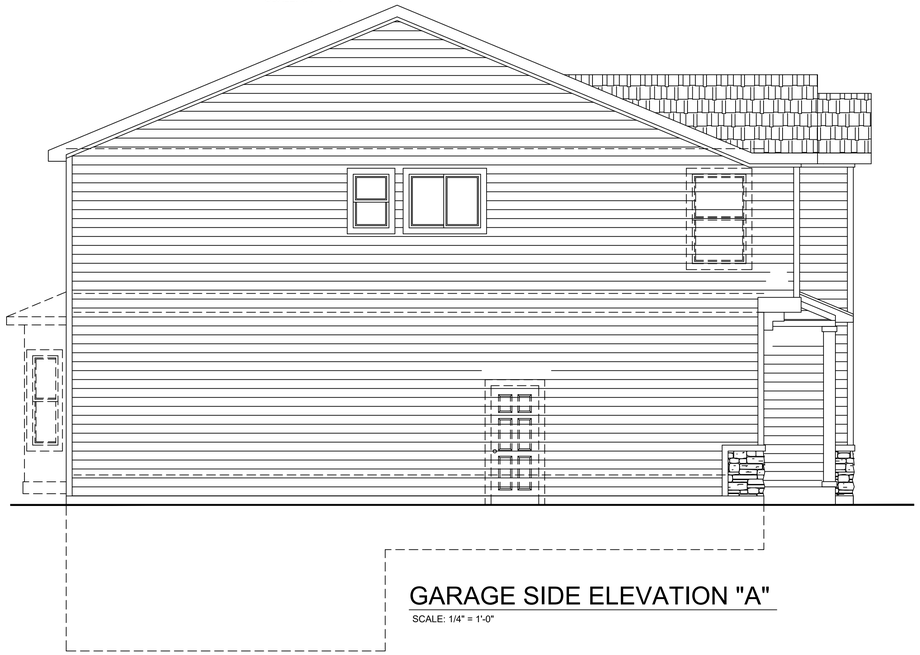
REAR ELEVATION "A"

SCALE: 1/4" = 1'-0"



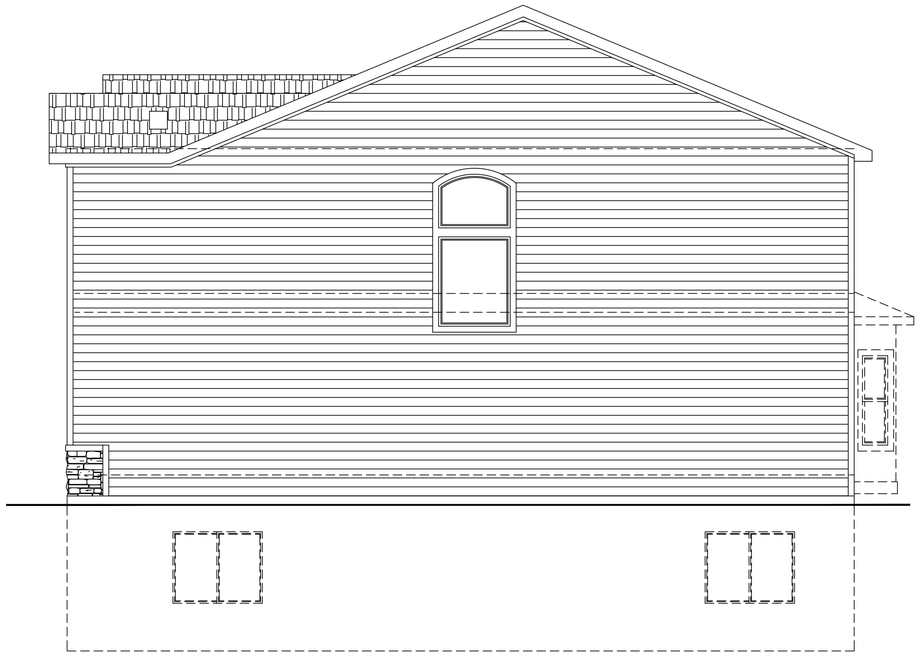
D2659.5 FRONT ELEVATION "A"

SCALE: 1/4" = 1'-0" (SHOWN w/ OPTIONAL BASEMENT)



GARAGE SIDE ELEVATION "A"

SCALE: 1/4" = 1'-0"



RIGHT ELEVATION "A"

SCALE: 1/4" = 1'-0"

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SHEET NAME
ELEVATION- "A"

PROJECT NAME
MASTER PLAN D2659.5

STAMPS/ENDORSEMENTS

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| BY | TYPE | DATE |
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| BY | TYPE | DATE |
|---|---|---|
| | | |

ELEVATION "A"

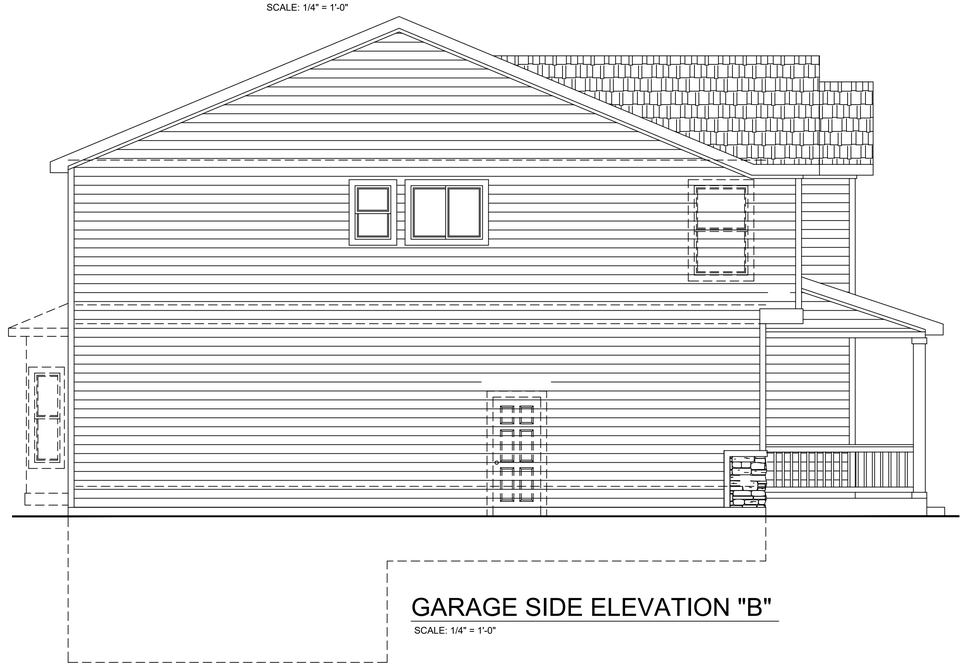
SHEET NUMBER
41

## REAR ELEVATION "B"

SCALE: 1/4" = 1'-0"

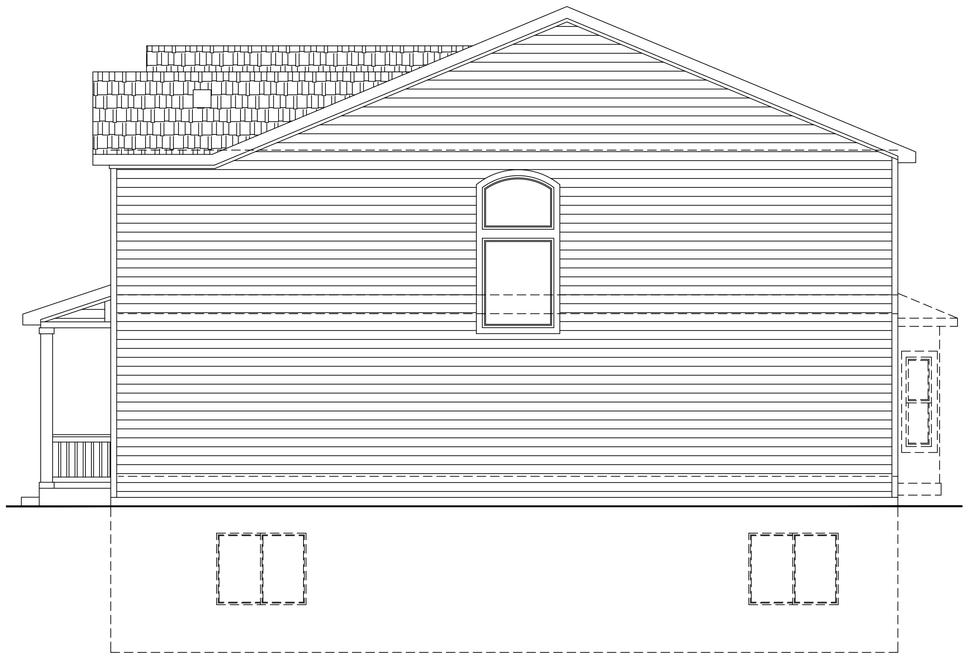
## D2659.5 FRONT ELEVATION "B"

SCALE: 1/4" = 1'-0" (SHOWN w/ OPTIONAL BASEMENT)



## GARAGE SIDE ELEVATION "B"

SCALE: 1/4" = 1'-0"



## RIGHT ELEVATION "B"

SCALE: 1/4" = 1'-0"

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SHEET NAME: ELEVATION- "B"

PROJECT NAME: MASTER PLAN D2659.5

STAMPS/ENDORSEMENTS

DRAWN BY: AL

DATE: 8/27/18

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ELEVATION "B"

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42

REAR ELEVATION "E"

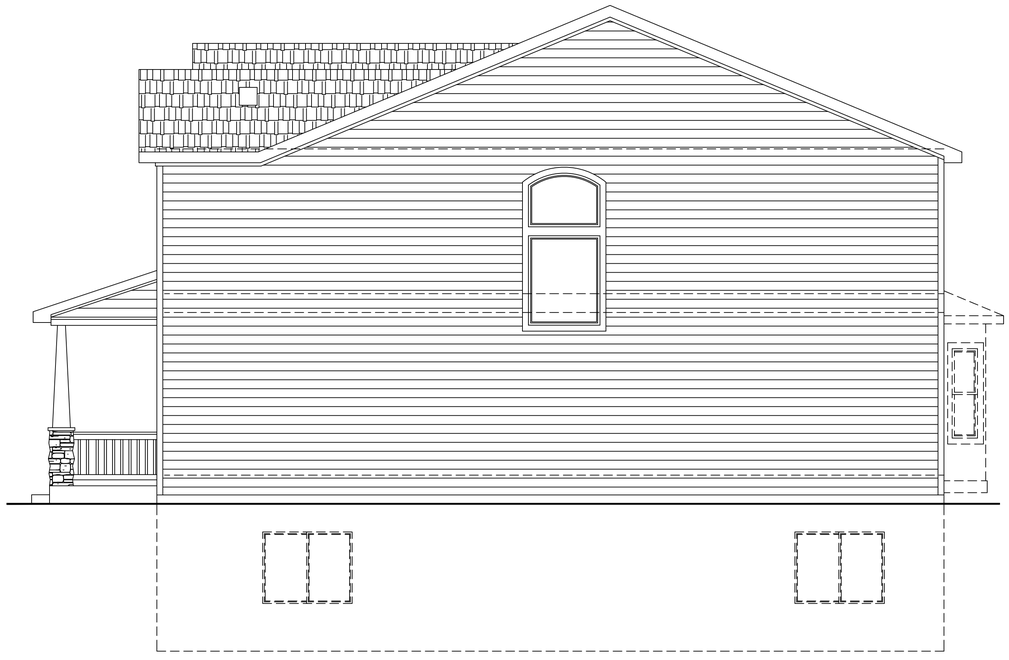
SCALE: 1/4" = 1'-0"

D2659.5 FRONT ELEVATION "E"

SCALE: 1/4" = 1'-0" (SHOWN w/ OPTIONAL BASEMENT)

GARAGE SIDE ELEVATION "E"

SCALE: 1/4" = 1'-0"



RIGHT ELEVATION "E"

SCALE: 1/4" = 1'-0"

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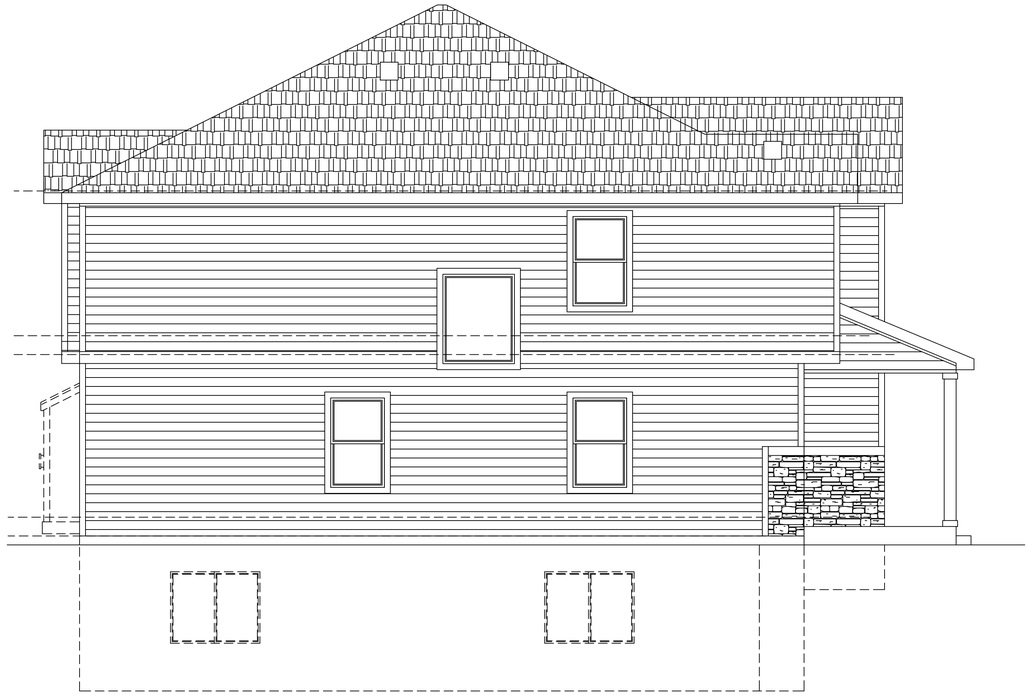
ELEVATION "E"

SHEET NUMBER
43



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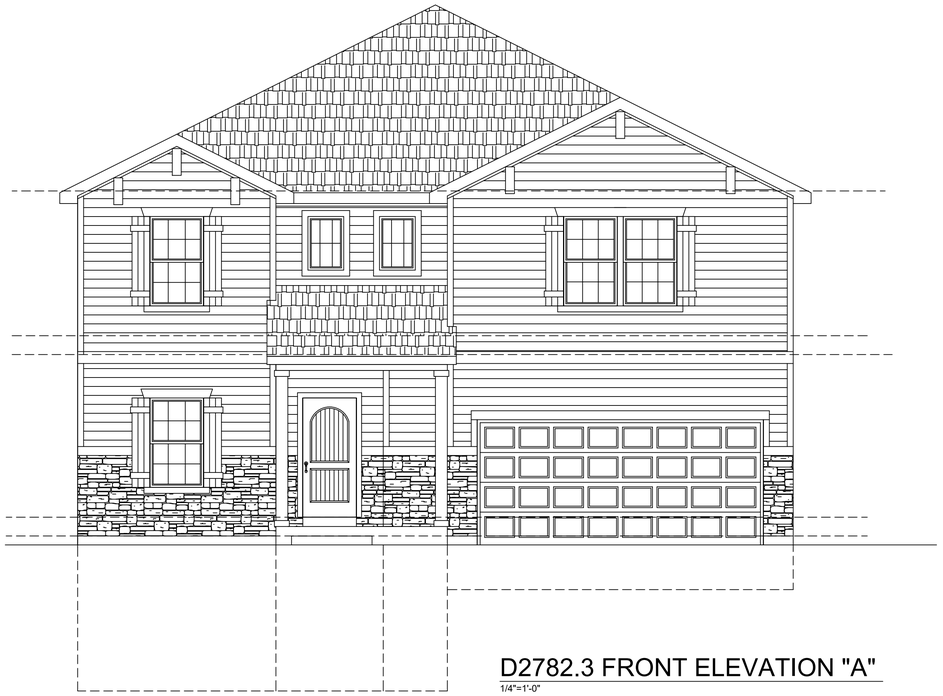

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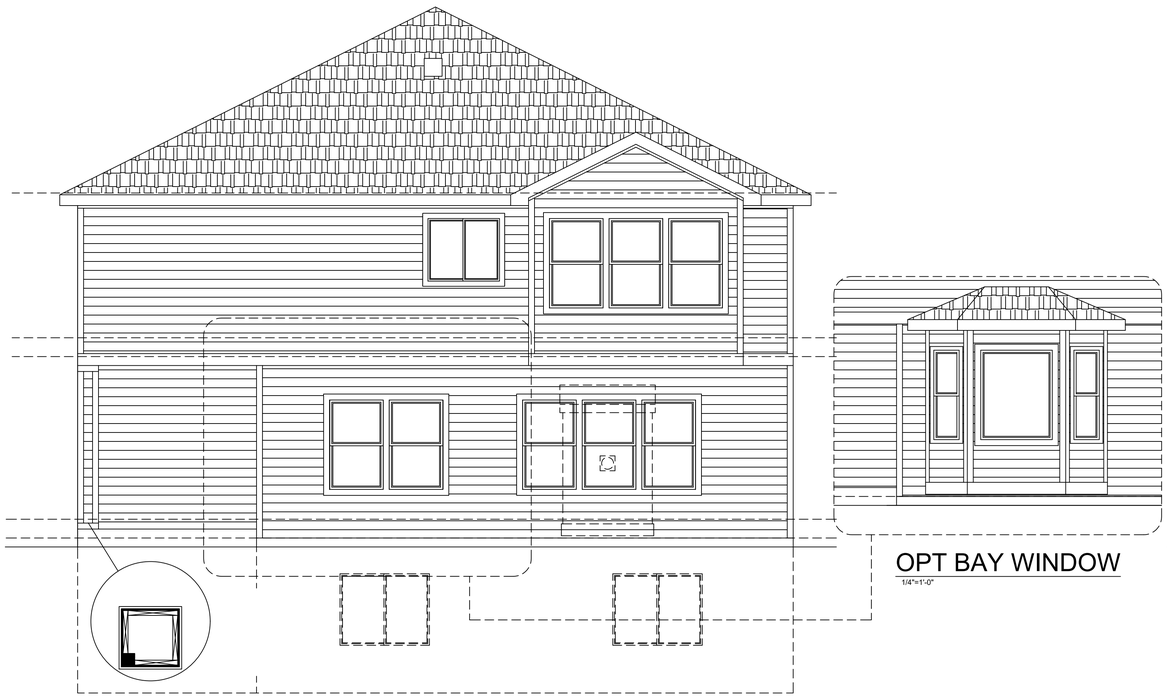
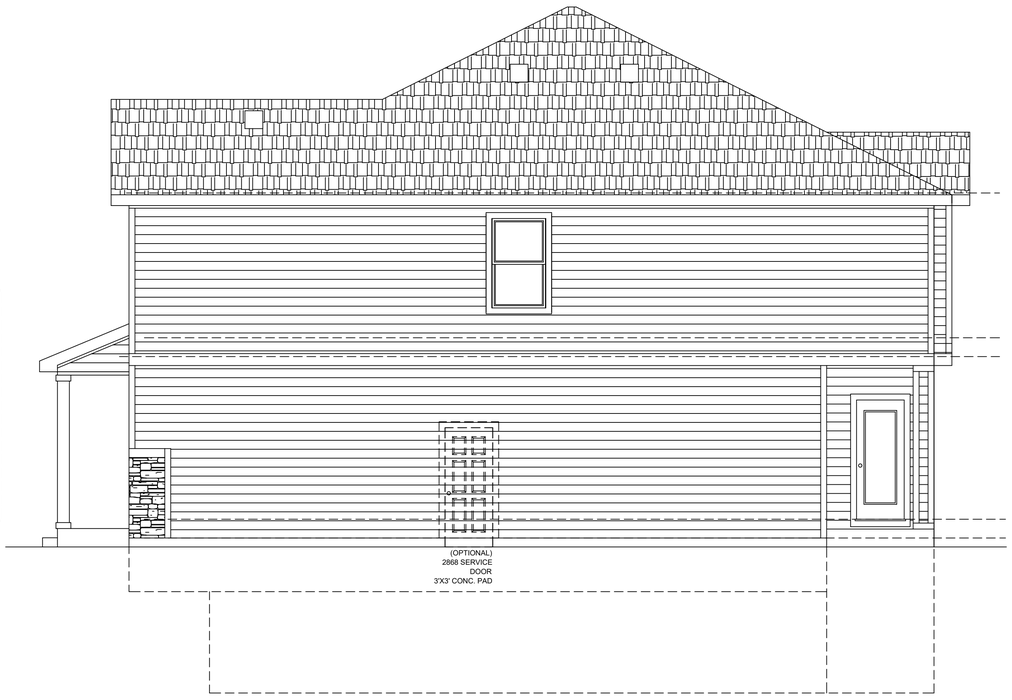


REAR ELEVATION "A"
1/4"=1'-0"



OPT BAY WINDOW
1/4"=1'-0"




GARAGE SIDE ELEVATION "A"
1/4"=1'-0"

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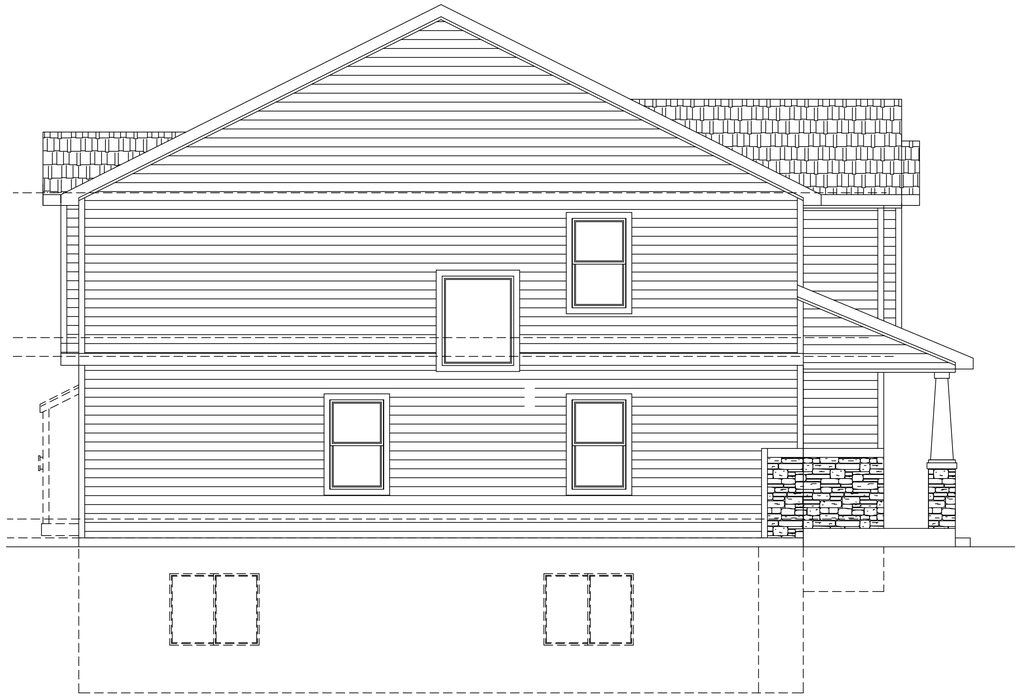
ELEVATION "A"

SHEET NUMBER
44



SIDE ELEVATION "B"
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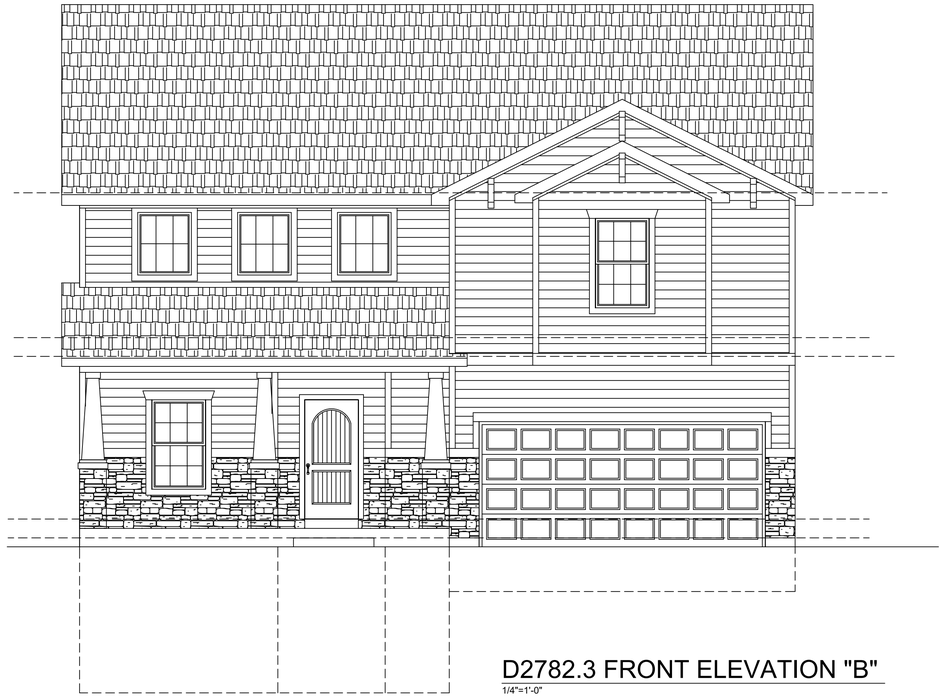

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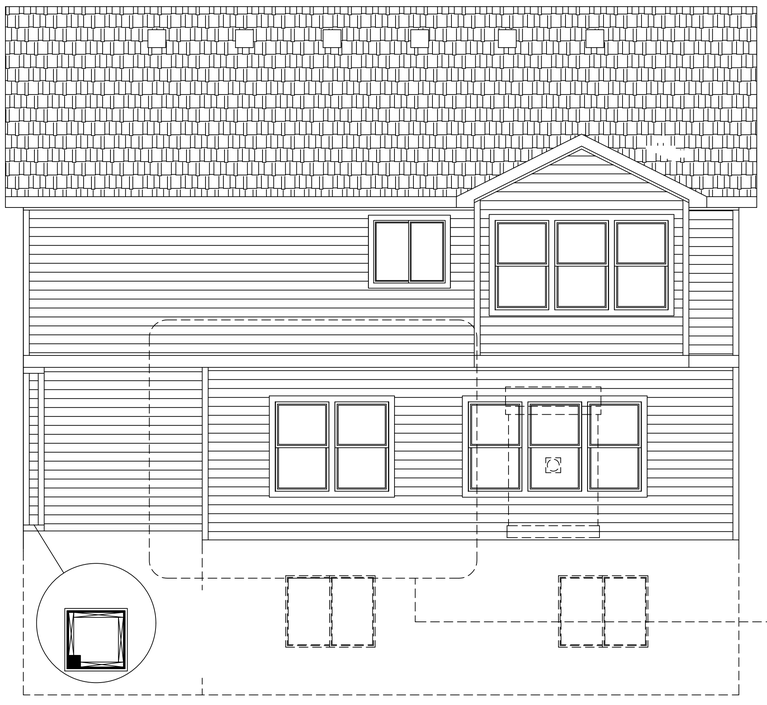

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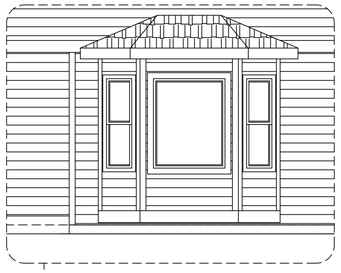

OPT BAY WINDOW
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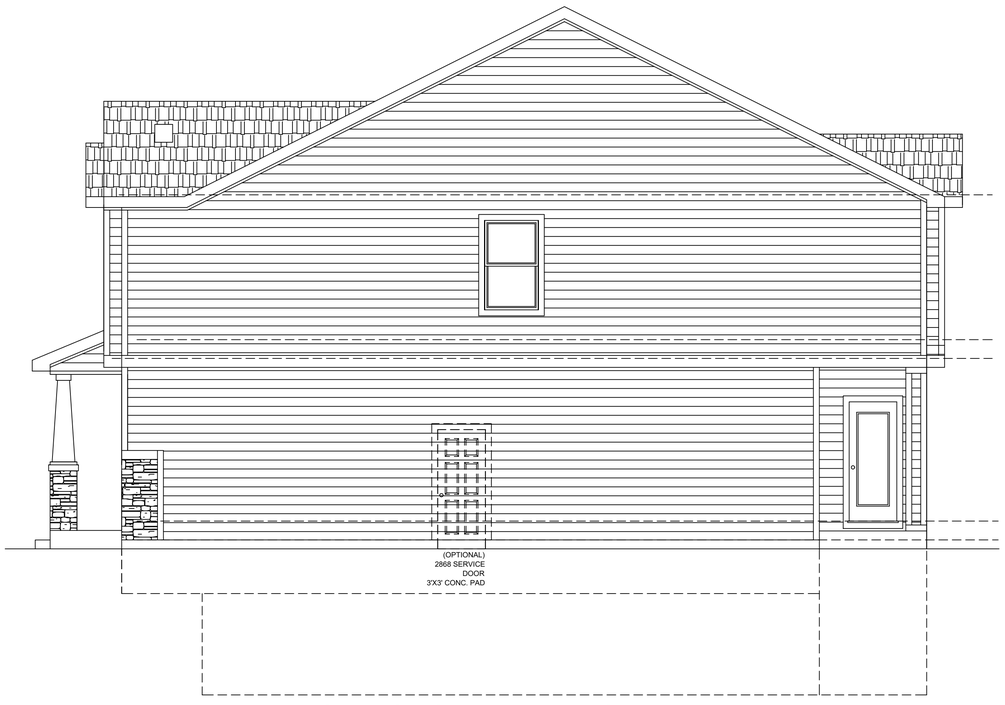


GARAGE SIDE ELEVATION "B"
1/4"=1'-0"

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ELEVATION "B"

SHEET NUMBER
45

SIDE ELEVATION "C"
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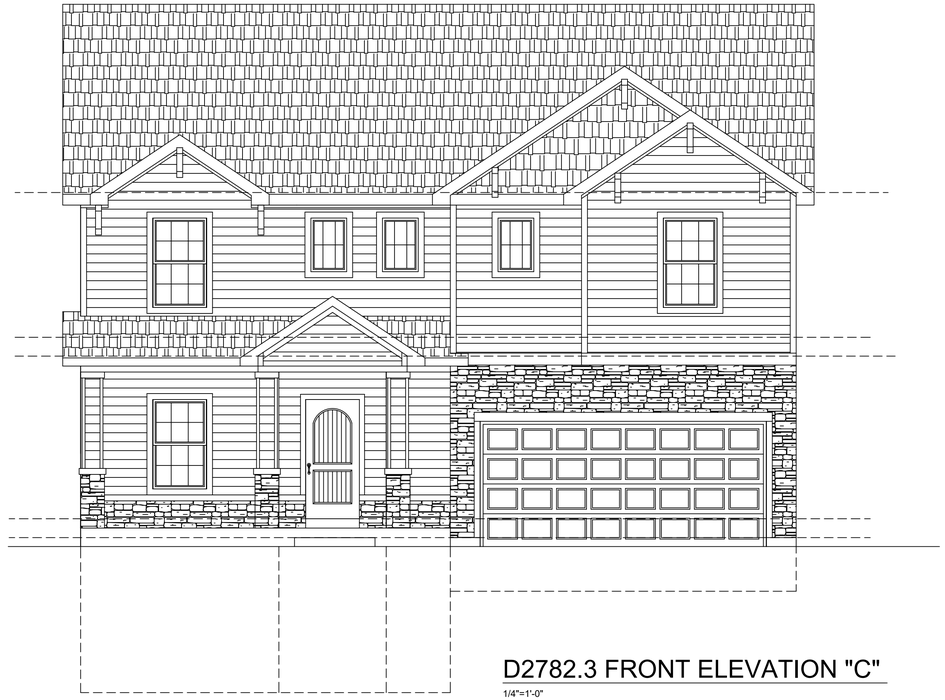

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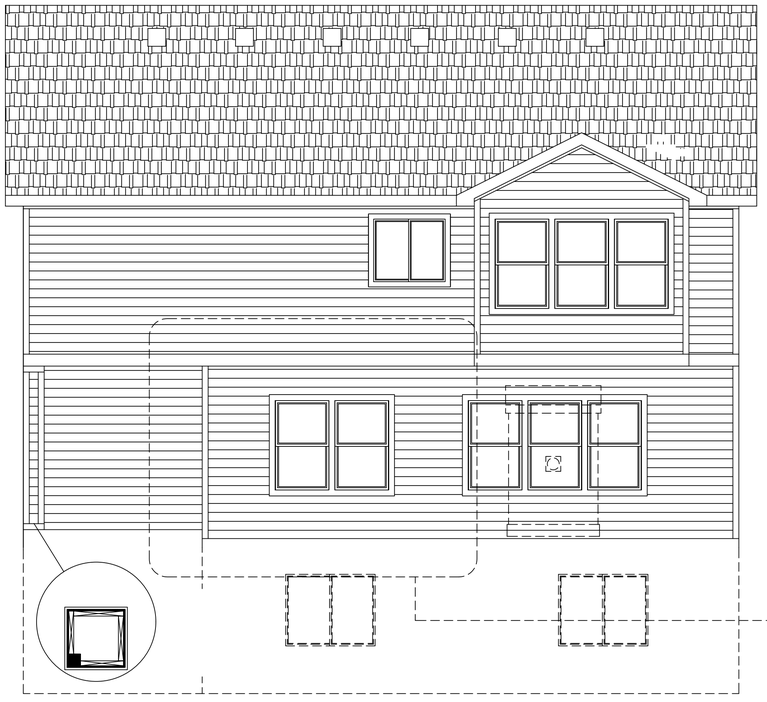
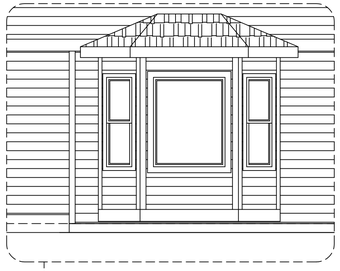
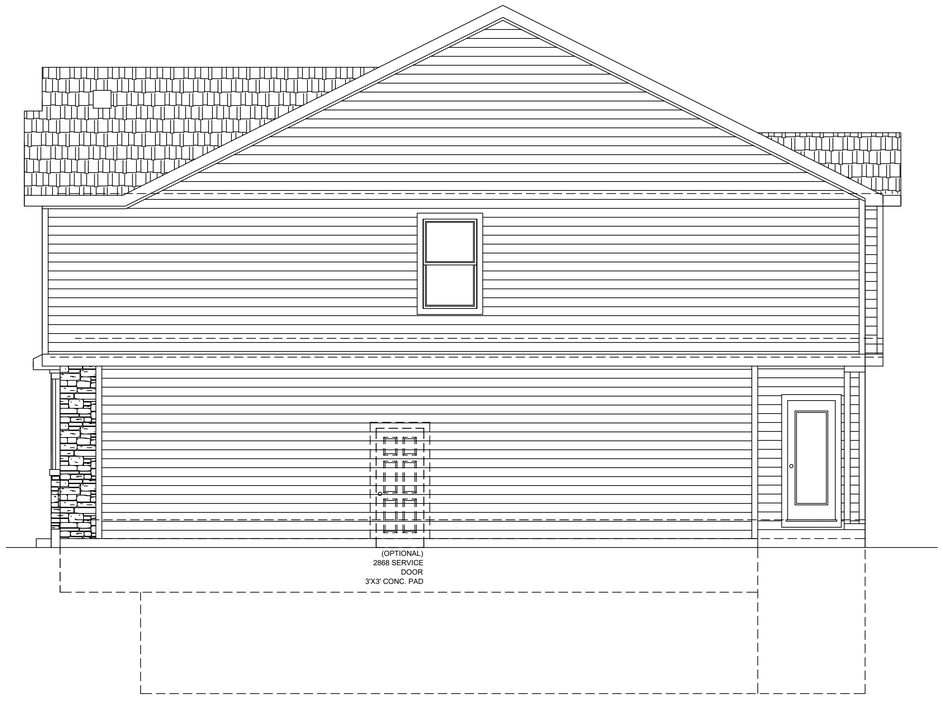




OPT BAY WINDOW
1/4"=1'-0"

REAR ELEVATION "C"
1/4"=1'-0"




GARAGE SIDE ELEVATION "C"
1/4"=1'-0"

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PROJECT NAME
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ELEVATION "C"

SHEET NUMBER
46

# COYOTE CREEK FILING NO. 4
# FINAL PHASE II DRAINAGE REPORT

November 2021

Prepared For:
**Lupton Land, LLC**
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Lone Tree, CO 80124
(303) 587-1966
Contact: Bob Quinette

Prepared By:
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7200 South Alton Way, Suite C400
Centennial, Colorado 80112
303-740-9393
Contact: Aaron Clutter, PE

(Project No. 16093.00)

# Table of Contents

CERTIFICATION STATEMENT ..... ii
I. LOCATION & BASIN DESCRIPTION ..... 1
Project Location and Description ..... 1
II. DRAINAGE BASINS ..... 2
Major Basin Description ..... 2
Proposed Sub-Basin Description ..... 2
III. DRAINAGE DESIGN CRITERIA ..... 4
Development Criteria Reference ..... 4
Hydrologic Criteria ..... 4
Hydraulic Criteria ..... 4
IV. DRAINAGE FACILITY DESIGN ..... 4
General Concept ..... 4
Conformance with Coyote Creek Master Drainage Study ..... 5
V. SUMMARY ..... 5
VI. REFERENCES ..... 5

**Appendices**

A: Vicinity Map, Hydrologic Soils Group, IDF Data, FIRMette
B: Hydrologic Calculation
C: Hydraulic Calculations
D: Coyote Creek Master Drainage Report Reference
E: Drainage Maps

# CERTIFICATION STATEMENT

This Preliminary Drainage Report for the design of the Coyote Creek Filing No. 4 development was prepared by me or under my direct supervision in accordance with the City of Fort Lupton's Standards and Specifications and acceptable professional practices of the industry. We acknowledge that the City of Fort Lupton's review of this Preliminary Drainage Report is only for general conformance with submittal requirements, current design criteria and standard engineering principles and practices. We are also aware of the provisions of the City Code of the City of Fort Lupton.

_____

Andrew J Hugill, Registered Professional Engineer
Colorado Professional Engineer No. 57007
For and on behalf of JR Engineering, LLC

# I. LOCATION & BASIN DESCRIPTION

## Project Location and Description

Coyote Creek Filing No. 4 is a proposed single-family residential Planned Unit Development (PUD) located within Section 5, Township 1 North, Range 66 West of the 6th Principal Meridian, City of Fort Lupton, Weld County, Colorado.

The approximately 13-acre site is bounded by the Shortline Ditch regional channel to the west, Twombly Elementary School to the north, and Coyote Creek Golf Course to the southeast and 4th St. to the south. The site is located roughly 1,000 feet north of 1st St. and 600 feet south of 9th St. A vicinity map is included in Appendix A. The site is located within the Coyote Creek Subdivision with the Vincents East Subdivision directly to the west.

The site is composed of type B soils which are characterized as having a moderate infiltration rate when thoroughly wet. Approximately 90 percent of the site is covered in native grasses with the ground generally sloping from east to west between zero and 3 percent.

This report presents the preliminary drainage analysis for Coyote Creek Filing No. 4. The proposed use for this site will be a residential subdivision composed of 59 single-family detached units with a local park. There is a 30" irrigation line bisecting the approximate center of the site from east to west. There is an existing 30' sanitary sewer easement along the site's western boundary and a sanitary lift station located in the northwest corner of the site.

# II. DRAINAGE BASINS

## Major Basin Description

The existing Coyote Creek Filing No.4 site is vacant with no FIRM map panel available for the subject site but the FIRMette is located in Appendix A. The site is located within Zone X which is a zone of minimal flood hazard.

## Proposed Sub-Basin Description

Existing runoff generated from the site is routed from east to west via sheet flow into the Shortline Ditch. There is also a small portion of the existing site that is depressed with a concrete overflow structure and 18" CMP pipe to drain the area west into the adjacent Shortline ditch. The Shortline ditch routes all runoff from the site north to a regional detention facility.

Sub-basin A1:
Sub-basin A1 is approximately 2.33 acres in size and made up of single family residential area, lawns/open space, streets and sidewalk. Runoff (Q5 = 3.9 cfs, and Q100 = 9.8 cfs) generated in this basin is currently conveyed via sheet flow to Lupton Lane where the flow will ultimately be conveyed southwest via curb and gutter to a 10' Type R sump Inlet at design point 1 (DP1). Flows collected at this inlet will be piped northwest to the Shortline ditch.

Sub-basin A2:
Sub-basin A2 is approximately 1.80 acres in size and made up of single family residential area, lawns/open space, streets and sidewalk. Runoff (Q5 = 3.8 cfs, and Q100 = 8.8 cfs) generated in this basin is currently conveyed via sheet flow to Raffi Road and Lupton Lane where the flow will ultimately be conveyed south west via curb and gutter to a 10' Type R sump Inlet at design point 2 (DP2). Flows collected at this inlet will be piped northwest to the Shortline ditch.

Sub-basin A3:
Sub-basin A3 is approximately 0.48 acres in size and made up of single family residential area, lawns/open space, streets and sidewalk. Runoff (Q5 = 1.1 cfs, and Q100 = 2.6 cfs) generated in this basin is currently conveyed via sheet flow to Raffi Road where the flow will ultimately be conveyed north via curb and gutter to a 10' Type R Inlet at design point 3 (DP3). Flows collected at this inlet will be piped west to the Shortline ditch.

Sub-basin A4:
Sub-basin A4 is approximately 2.94 acres in size and made up of single family residential area, lawns/open space, streets and sidewalk. Runoff (Q5 = 5.7 cfs, and Q100 = 13.8 cfs) generated in this basin is currently conveyed via sheet flow to Lupton Lane and Logan Way where the flow will ultimately be conveyed west via curb and gutter to a 10' Type R Inlet at design point 4 (DP4). Flows collected at this inlet will be piped north then west to the Shortline ditch.

Sub-basin A5:
Sub-basin A5 is approximately 3.88 acres in size and made up of single family residential area, lawns/open space, streets and sidewalk. Runoff (Q5 = 6.4 cfs, and Q100 = 16.1 cfs) generated in

this basin is currently conveyed via sheet flow to Raffi Road and Logan Way where the flow will ultimately be conveyed north via curb and gutter to a 10' Type R Inlet at design point 5 (DP5). Flows collected at this inlet will be piped west to the Shortline ditch.

Sub-basin B1:
Sub-basin B1 is approximately 1.46 acres in size and made up of lawns/open space. Runoff (Q5 = 1.6 cfs, and Q100 = 5.0 cfs) generated in this basin is currently conveyed via sheet flow west directly into the Shortline Ditch.

Sub-basin B2:
Sub-basin B2 is approximately 0.17 acres in size and made up of single family residential area, lawns/open space, streets and sidewalk. Runoff (Q5 = 0.5 cfs, and Q100 = 1.2 cfs) generated in this basin is currently conveyed via sheet flow to Raffi Road where the flow will ultimately be conveyed north via curb and gutter to a crosspan at design point 7 (D). Flows collected at this crosspan will travel approximately 120' along existing curb and gutter before entering an existing concrete rundown into the Shortline Ditch.

# III. DRAINAGE DESIGN CRITERIA

## Development Criteria Reference

Storm Drainage Analysis and Design Criteria for this project were implemented from the City of Fort Lupton Storm Drainage Criteria and the "Urban Storm Drainage Criteria Manual" by Mile High Flood District (MHFD).

The design storms are the 5-year storm event and the 100-year storm event. Storm sewer and roadways have been designed to safely convey the 5-year and 100-year event with inlets. Rainfall intensity data was taken from Table 502 of City of Fort Lupton Criteria which can be found in Appendix A.

## Hydrologic Criteria

All hydrologic data was obtained from the "City of Fort Lupton Standards and Specifications Manual" and the "Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual" Volumes 1, 2, and 3. Onsite drainage improvements were designed based on the 5 year (minor) storm event and the 100-year (major) storm event. Runoff was calculated using the Rational Method, and rainfall intensities for the 5-year and the 100-year storm return frequencies were obtained from Table 502 of the Fort Lupton Criteria Located in Appendix A. Runoff coefficients were determined based on proposed land use and from data in Table 602 from Section 6 of the Fort Lupton Criteria. Time of concentrations were developed using equations from Section 6 of the Fort Lupton Criteria. All runoff calculations and applicable charts and graphs are included in Appendix B.

## Hydraulic Criteria

The Rational Method and USDCM's SF-2 and SF-3 forms were used to determine the runoff from the minor and major storms on the site. UDFCD UD-Inlet v5.05. will be used to size the inlets.

# IV. DRAINAGE FACILITY DESIGN

## General Concept

The proposed Coyote Creek Filing No. 4 site is designed to convey generated runoff via storm sewers, along curb and gutter, and via surface flow to the existing Shortline Ditch on the west side of the site. Secondly, surface overflow paths have been provided, such that the 100-year storm flows remain at least one foot below the finished floor elevation in a fully clogged inlet condition. This report analyses runoff generated on-site and not any runoff generated on the golf course to the east. The Master Drainage study for Coyote creek indicates that the Golf Course is responsible to capture all flow generated from the course.

## Conformance with Coyote Creek Master Drainage Study

Coyote Creek Filing No. 4 was originally studied in the Coyote Creek Master Drainage Study by Merrick and Company dated September 12, 1996. Filing No.4 is known within the Master Study as Basin I. The Master Drainage Study can be found in Appendix C. The original intent for the basin was for Multifamily residential use with a specific road layout and the master study indicates that if the site use, grading, and street alignment change that a Phase II or Phase III report will need to be done. The purpose of this report is to account for the changes from the Master Study.

The Master Study indicates that no detention or water quality is necessary for the site once the City completes the Regional Detention Facility to the north which exists at this time. The Master study also indicates "The golf course will be required to retain all of their runoff on the golf course for all events up to a maximum of the 100-year storm". This report does not account for any runoff generated on the golf course to the east and only analyses the basins on the property which is consistent with the Master Drainage Study.

# V. SUMMARY

The proposed site improvements for the Coyote Creek Filing No. 4 site are consistent with the approved Master Drainage Study referenced herein. On-site detention is not required as all site runoff will be directed to the Shortline Ditch and ultimately the Regional Detention Pond. Once flow data for the Shortline Ditch becomes available, the addition of site flows will be analyzed. It is assumed that there is sufficient capacity in the Shortline Ditch to handle site runoff during the 100 year event. The site has no adverse drainage impacts on adjacent properties, surrounding developments, or downstream infrastructure. As a result, the proposed drainage design outlined in this report meets the latest City of Fort Lupton Storm Drainage Criteria.

The storm system is designed to take enough water to ensure that the roadways can convey the 100 year event safely. 4.10 cfs will ultimately bypass flowby inlets to the north offsite where the flow will travel approximately 150 feet vial curb and gutter to a concrete rundown into the Shortline Ditch.

# VI. REFERENCES

1. 2018 International Fire Code; 2018
2. City of Fort Lupton, Standards and Specifications for the Design and Construction of Public Improvements; 2014
3. City of Fort Lupton and Clear Water Solutions, Inc., 2018 Municipal Water Efficiency Plan; 2018.
4. Merrick & Company, Coyote Creek Master Drainage Study

# Appendix A
# Vicinity Map, Hydrologic Soils Group, IDF Data, FIRMette

N

500 250 0 500

ORIGINAL SCALE: 1" = 500'

APPENDIX A
VICINITY MAP
JOB NO. 16093.00
2021-11-10
SHEET 1 OF 1

J·R ENGINEERING
A Westrian Company

Centennial 303-740-9393 • Colorado Springs 719-593-2593
Fort Collins 970-491-9888 • www.jrengineering.com

Map Scale: 1:2,510 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 35 70 140 210

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

## MAP LEGEND

**Area of Interest (AOI)**

- Area of Interest (AOI)

**Soils**

**Soil Rating Polygons**

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

**Soil Rating Lines**

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

**Soil Rating Points**

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

**Water Features**

- Streams and Canals

**Transportation**

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

**Background**

- Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Weld County, Colorado, Southern Part
Survey Area Data: Version 20, Aug 31, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 19, 2018—Aug 10, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

# Hydrologic Soil Group

| Map unit symbol | Map unit name | Rating | Acres in AOI | Percent of AOI |
|---|---|---|---|---|
| 37 | Nelson fine sandy loam, 0 to 3 percent slopes | B | 6.7 | 41.0% |
| 47 | Olney fine sandy loam, 1 to 3 percent slopes | B | 9.6 | 59.0% |
| **Totals for Area of Interest** | | | **16.2** | **100.0%** |

## Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

## Rating Options

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff: None Specified*

*Tie-break Rule:* Higher

Table 502
Time-Intensity-Frequency Tabulation
for the Rational Method

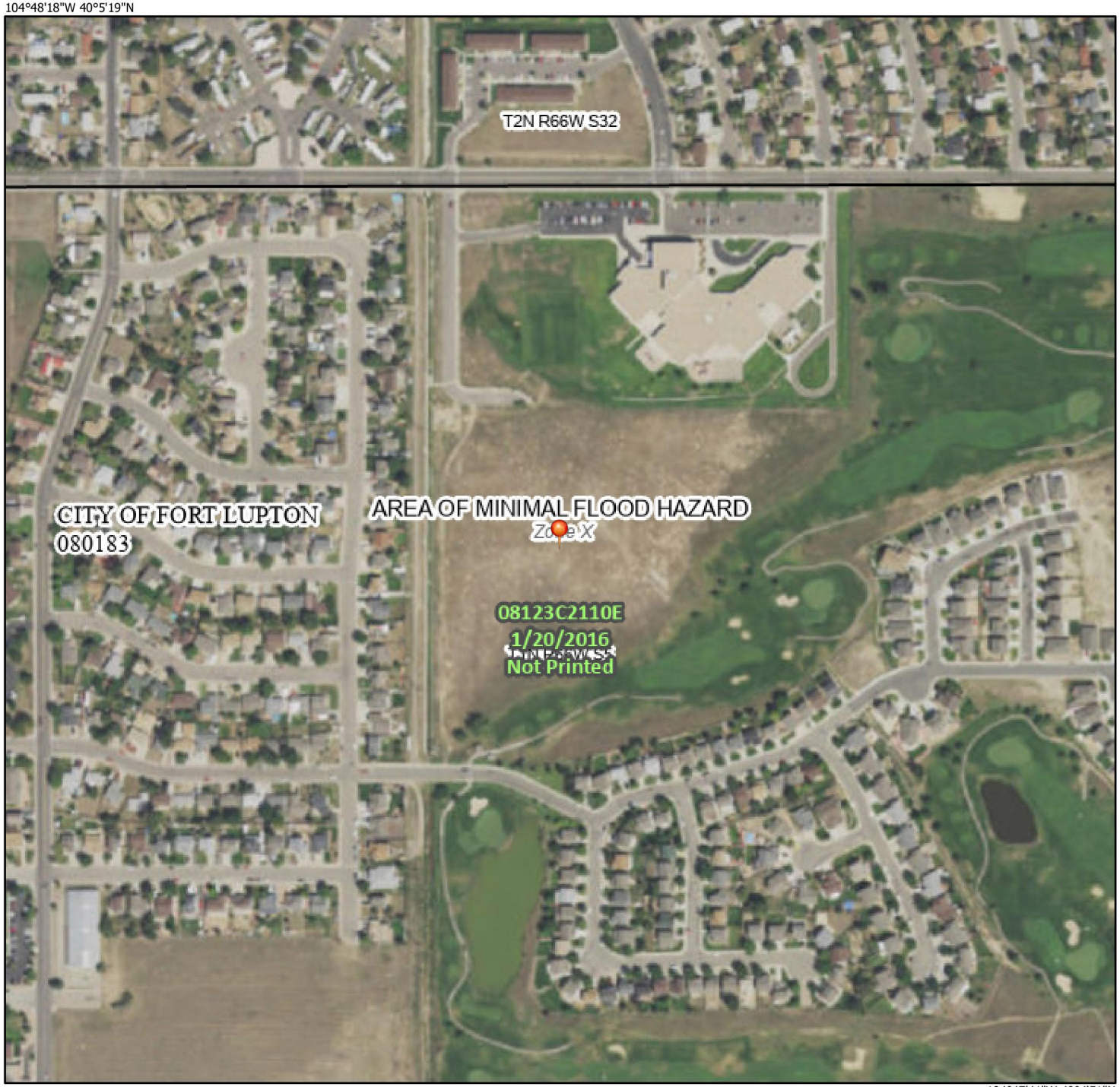
Rainfall Intensity
(in/hr)/duration

| Frequency | 5-min | 10-min | 15-min | 30-min | 60-min |
|---|---|---|---|---|---|
| 2-year | 3.48 | 2.70 | 2.28 | 1.58 | 1.00 |
| 5-year | 4.92 | 3.84 | 3.24 | 2.24 | 1.42 |
| 10-year | 5.88 | 4.56 | 3.84 | 2.66 | 1.68 |
| 50-year | 8.16 | 6.36 | 5.36 | 3.72 | 2.35 |
| 100-year | 9.48 | 7.32 | 6.16 | 4.28 | 2.71 |

# National Flood Hazard Layer FIRMette

FEMA

104°48'18"W 40°5'19"N




104°47'41"W 40°4'51"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

*Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020*

## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

**SPECIAL FLOOD HAZARD AREAS**
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

**OTHER AREAS OF FLOOD HAZARD**
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

**OTHER AREAS**
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

**GENERAL STRUCTURES**
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

**OTHER FEATURES**
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

**MAP PANELS**
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 11/16/2021 at 11:30 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

# Appendix B
# Hydrologic Calculations

# COMPOSITE RUNOFF COEFFICIENT CALCULATIONS

Subdivision: Coyote Creek Filing No. 4
Location: Fort Lupton

Project Name: Liberty Animal Hospital
Project No.: 16093.00
Calculated By: AJH
Checked By:
Date: 12/13/21

| Basin ID | Total Area (ac) | Paved Roads/Walks | | | Single Family | | | Lawns/Open Space | | | Basins Total Weighted 5 YEAR C | Basins Total Weighted 100 YEAR C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Area (ac) | 5 - YEAR C | 100 - YEAR C | Area (ac) | 5 - YEAR C | 100 - YEAR C | Area (ac) | 5 - YEAR C | 100 - YEAR C | | |
| | | | | | | | | | | | | |
| A1 | 2.33 | 0.44 | 0.88 | 0.93 | 1.52 | 0.45 | 0.60 | 0.37 | 0.18 | 0.45 | 0.49 | 0.64 |
| A2 | 1.80 | 0.60 | 0.88 | 0.93 | 1.05 | 0.45 | 0.60 | 0.15 | 0.18 | 0.45 | 0.57 | 0.70 |
| A3 | 0.48 | 0.22 | 0.88 | 0.93 | 0.17 | 0.45 | 0.60 | 0.09 | 0.18 | 0.45 | 0.60 | 0.73 |
| A4 | 2.94 | 0.68 | 0.88 | 0.93 | 1.97 | 0.45 | 0.60 | 0.30 | 0.18 | 0.45 | 0.52 | 0.66 |
| A5 | 3.88 | 0.84 | 0.88 | 0.93 | 2.28 | 0.45 | 0.60 | 0.77 | 0.18 | 0.45 | 0.49 | 0.64 |
| B1 | 1.46 | 0.00 | 0.88 | 0.93 | 0.73 | 0.45 | 0.60 | 0.73 | 0.18 | 0.45 | 0.32 | 0.53 |
| B2 | 0.17 | 0.07 | 0.88 | 0.93 | 0.09 | 0.45 | 0.60 | 0.00 | 0.18 | 0.45 | 0.63 | 0.74 |
| | | | | | | | | | | | | |
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# STANDARD FORM SF-2
# TIME OF CONCENTRATION

Subdivision: Coyote Creek Filing No. 4
Location: 2_SF2

Project Name: Liberty Animal Hospital
Project No.: 16093.00
Calculated By: AJH
Checked By:
Date: 12/13/21

| SUB-BASIN DATA | | | | | | INITIAL/OVERLAND ($T_i$) | | | TRAVEL TIME ($T_t$) | | | | | *tc* CHECK (URBANIZED BASINS) | | | FINAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BASIN ID | D.A. (ac) | Hydrologic Soils Group | Impervious (%) | $C_5$ | $C_{100}$ | $L$ (ft) | $S_o$ (%) | $t_i$ (min) | $L_t$ (ft) | $S_t$ (%) | $K$ | VEL. (ft/s) | $t_t$ (min) | COMP. $t_c$ (min) | TOTAL LENGTH (ft) | Urbanized $t_c$ (min) | $t_c$ (min) |
| | | | | | | | | | | | | | | | | | |
| A1 | 2.33 | B | 52% | 0.49 | 0.64 | 140 | 2.8 | 9.3 | 588 | 1.7 | 20.0 | 2.6 | 3.8 | 13.0 | 728.0 | 13.3 | 13.0 |
| A2 | 1.80 | B | 62% | 0.57 | 0.70 | 108 | 2 | 7.9 | 565 | 1.8 | 20.0 | 2.7 | 3.5 | 11.4 | 673.0 | 13.1 | 11.4 |
| A3 | 0.48 | B | 64% | 0.60 | 0.73 | 70 | 1.64 | 6.4 | 360 | 0.8 | 20.0 | 1.8 | 3.4 | 9.7 | 430.0 | 12.0 | 9.7 |
| A4 | 2.94 | B | 56% | 0.52 | 0.66 | 100 | 3.8 | 6.7 | 760 | 2.1 | 20.0 | 2.9 | 4.4 | 11.1 | 860.0 | 14.2 | 11.1 |
| A5 | 3.88 | B | 51% | 0.49 | 0.64 | 197 | 2.74 | 11.1 | 664 | 2.1 | 20.0 | 2.9 | 3.8 | 14.9 | 861.0 | 13.7 | 13.7 |
| B1 | 1.46 | B | 29% | 0.32 | 0.53 | 100 | 1 | 14.1 | 684 | 0.3 | 20.0 | 1.1 | 10.4 | 24.5 | 784.0 | 13.8 | 13.8 |
| B2 | 0.17 | B | 69% | 0.63 | 0.74 | 67 | 3.87 | 4.4 | 85 | 2 | 20.0 | 2.8 | 0.5 | 4.9 | 152.0 | 10.5 | 5.0 |
| | | | | | | | | | | | | | | | | | |
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*NOTES:*

$$t_C = t_i + t_t \quad (6\text{-}2)$$

Where: $t_c$ = time of concentration (minutes)
$t_i$ = initial time or overland flow time (minutes)
$t_t$ = travel time in the ditch, channel, gutter, storm sewer, etc. (minutes)

$$t_c = \frac{L}{180} + 10 \quad (6\text{-}5)$$

Where: $t_c$ = time of concentration at the first design point (minutes)
L = length of basin (feet)

$$t_i = \frac{1.8(1.1-C5)\sqrt[2]{L}}{\sqrt[3]{s}} \quad (6\text{-}3)$$

Where: $t_i$ = overland flow time (minutes)
$C_5$ = runoff coefficient for 5-year frequency (Table 602)
L = length of overland flow (feet, 500 feet maximum)
s = average basin slope (percent)

For basin lengths greater than 500 feet, the overland flow time needs to be considered in combination with the travel time ($t_t$). The travel time ($t_t$) is calculated using the hydraulic properties of the swale, ditch, channel, or street. Travel time is calculated using Equation 6-4. For preliminary work, the travel time ($t_t$) can be estimated using Figure 602.

$$t_t = \frac{L}{60V} \quad (6\text{-}4)$$

**Table 6-2. NRCS Conveyance factors, K**

| Type of Land Surface | Conveyance Factor, K |
|---|---|
| Heavy meadow | 2.5 |
| Tillage/field | 5 |
| Short pasture and lawns | 7 |
| Nearly bare ground | 10 |
| Grassed waterway | 15 |
| Paved areas and shallow paved swales | 20 |

Use a minimum $t_c$ value of 5 minutes for urbanized areas and a minimum $t_c$ value of 10 minutes for areas that are not considered urban. Use minimum values even when calculations result in a lesser time of concentration.

# STANDARD FORM SF-3

## STORM DRAINAGE SYSTEM DESIGN

(RATIONAL METHOD PROCEDURE)

Subdivision: Coyote Creek Filing No. 4
Location: Fort Lupton
Design Storm: 5-Year

Project Name: Liberty Animal Hospital
Project No.: 16093.00
Calculated By: AJH
Checked By:
Date: 12/13/21

| STREET | Design Point | DIRECT RUNOFF | | | | | | | TOTAL RUNOFF | | | | STREET | | | PIPE | | | | TRAVEL TIME | | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Basin ID | Area (Ac) | Runoff Coeff. | $t_c$ (min) | C*A (Ac) | I (in/hr) | Q (cfs) | tc (min) | C*A (ac) | I (in/hr) | Q (cfs) | $Q_{street}$ (cfs) | C*A (ac) | Slope (%) | $Q_{pipe}$ (cfs) | C*A (ac) | Slope (%) | Pipe Size (inches) | Length (ft) | Velocity (fps) | $t_t$ (min) | |
| | 1 | A1 | 2.33 | 0.49 | 13.0 | 1.14 | 3.46 | 3.9 | | | | | | | | | | | | | | | |
| | 2 | A2 | 1.80 | 0.57 | 11.4 | 1.03 | 3.68 | 3.8 | | | | | | | | | | | | | | | |
| | 2.2 | | | | | | | | 13.0 | 2.17 | 3.46 | 7.5 | | | | 7.5 | 2.2 | 0.5 | 24 | 91 | 5.0 | 0.3 | Runoff from DP 1 and 2 captured by sump inlets |
| | 3 | A3 | 0.48 | 0.60 | 9.7 | 0.29 | 3.93 | 1.1 | | | | | | | | | | | | | | | |
| | 4 | A4 | 2.94 | 0.52 | 11.1 | 1.53 | 3.72 | 5.7 | | | | | | | | | | | | | | | |
| | 5 | A5 | 3.88 | 0.49 | 13.7 | 1.90 | 3.38 | 6.4 | | | | | | | | | | | | | | | |
| | 3.3 | | | | | | | | 13.7 | 3.72 | 3.38 | 12.6 | | | | 12.6 | 3.7 | 0.5 | 24 | 91 | 5.6 | 0.3 | Runoff from DP 3, 4, and 5 captured by on-grade inlets |
| | 6 | B1 | 1.46 | 0.32 | 13.8 | 0.46 | 3.37 | 1.6 | | | | | | | | | | | | | | | |
| | 7 | B2 | 0.17 | 0.63 | 5.0 | 0.11 | 4.92 | 0.5 | | | | | | | | | | | | | | | |
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Notes:
Street and Pipe C*A values are determined by Q/i using the catchment's intensity value.

# STANDARD FORM SF-3

## STORM DRAINAGE SYSTEM DESIGN

(RATIONAL METHOD PROCEDURE)

Subdivision: Coyote Creek Filing No. 4
Location: Fort Lupton
Design Storm: 100-Year

Project Name: Liberty Animal Hospital
Project No.: 16093.00
Calculated By: AJH
Checked By:
Date: 12/13/21

| STREET | Design Point | DIRECT RUNOFF | | | | | | | TOTAL RUNOFF | | | | STREET | | | PIPE | | | | TRAVEL TIME | | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Basin ID | Area (ac) | Runoff Coeff. | $t_c$ (min) | C*A (ac) | I (in/hr) | Q (cfs) | tc (min) | C*A (ac) | I (in/hr) | Q (cfs) | $Q_{street}$ (cfs) | C*A (ac) | Slope (%) | $Q_{pipe}$ (cfs) | C*A (ac) | Slope (%) | Pipe Size (inches) | Length (ft) | Velocity (fps) | $t_t$ (min) | |
| | 1 | A1 | 2.33 | 0.64 | 13.0 | 1.49 | 6.60 | 9.8 | | | | | | | | | | | | | | | |
| | 2 | A2 | 1.80 | 0.70 | 11.4 | 1.26 | 7.02 | 8.8 | | | | | | | | | | | | | | | |
| | 2.2 | | | | | | | | 13.0 | 2.75 | 6.60 | 18.2 | | | | 18.2 | 2.8 | 0.5 | 24 | 91 | 5.8 | 0.3 | |
| | 3 | A3 | 0.48 | 0.73 | 9.7 | 0.35 | 7.50 | 2.6 | | | | | | | | | | | | | | | |
| | 4 | A4 | 2.94 | 0.66 | 11.1 | 1.94 | 7.10 | 13.8 | | | | | | | | | | | | | | | |
| | 5 | A5 | 3.88 | 0.64 | 13.7 | 2.49 | 6.45 | 16.1 | | | | | | | | | | | | | | | |
| | 3.3 | | | | | | | | 13.7 | 4.78 | 6.45 | 30.8 | | | | 30.8 | 4.8 | 0.5 | 24 | 91 | 9.8 | 0.2 | |
| | 6 | B1 | 1.46 | 0.53 | 13.8 | 0.77 | 6.43 | 5.0 | | | | | | | | | | | | | | | |
| | 7 | B2 | 0.17 | 0.74 | 5.0 | 0.13 | 9.40 | 1.2 | | | | | | | | | | | | | | | |
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Notes:
Street and Pipe C*A values are determined by Q/i using the catchment's intensity value.

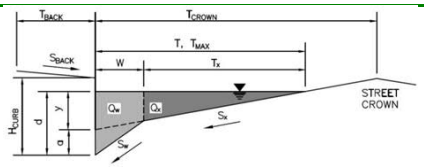
# Appendix C
# Hydraulic Calculations

# ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: Coyote Creek Filing No. 4

Inlet ID: Inlet 1




Gutter Geometry:

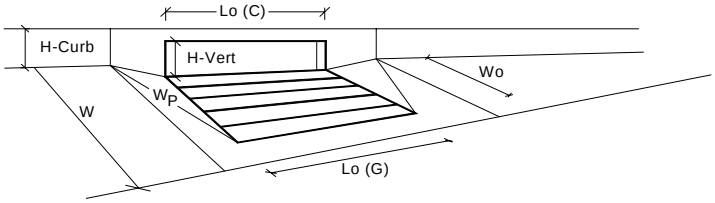
| | | | |
|---|---|---|---|
| Maximum Allowable Width for Spread Behind Curb | $T_{BACK}$ = | 7.0 | ft |
| Side Slope Behind Curb (leave blank for no conveyance credit behind curb) | $S_{BACK}$ = | 0.020 | ft/ft |
| Manning's Roughness Behind Curb (typically between 0.012 and 0.020) | $n_{BACK}$ = | 0.012 | |
| Height of Curb at Gutter Flow Line | $H_{CURB}$ = | 4.00 | inches |
| Distance from Curb Face to Street Crown | $T_{CROWN}$ = | 18.0 | ft |
| Gutter Width | W = | 2.00 | ft |
| Street Transverse Slope | $S_X$ = | 0.020 | ft/ft |
| Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft) | $S_W$ = | 0.083 | ft/ft |
| Street Longitudinal Slope - Enter 0 for sump condition | $S_O$ = | 0.000 | ft/ft |
| Manning's Roughness for Street Section (typically between 0.012 and 0.020) | $n_{STREET}$ = | 0.012 | |

| | | Minor Storm | Major Storm | |
|---|---|---|---|---|
| Max. Allowable Spread for Minor & Major Storm | $T_{MAX}$ = | 18.0 | 18.0 | ft |
| Max. Allowable Depth at Gutter Flowline for Minor & Major Storm | $d_{MAX}$ = | 4.0 | 5.7 | inches |
| Check boxes are not applicable in SUMP conditions | | ☐ | ☐ | |

| | | Minor Storm | Major Storm | |
|---|---|---|---|---|
| MINOR STORM Allowable Capacity is based on Depth Criterion | | | | |
| MAJOR STORM Allowable Capacity is based on Depth Criterion | $Q_{allow}$ = | SUMP | SUMP | cfs |

# INLET IN A SUMP OR SAG LOCATION

*MHFD-Inlet, Version 5.01 (April 2021)*



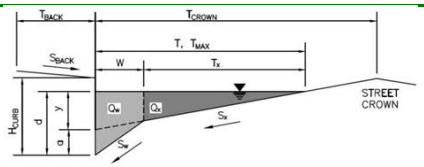

| Design Information (Input) | | MINOR | MAJOR | |
|---|---|---|---|---|
| Type of Inlet | Type = | CDOT Type R Curb Opening | | |
| Local Depression (additional to continuous gutter depression 'a' from above) | $a_{local}$ = | 5.00 | 5.00 | inches |
| Number of Unit Inlets (Grate or Curb Opening) | No = | 3 | 3 | |
| Water Depth at Flowline (outside of local depression) | Ponding Depth = | 4.0 | 5.7 | inches |
| **Grate Information** | | MINOR | MAJOR | ☐ Override Depths |
| Length of a Unit Grate | $L_o$ (G) = | N/A | N/A | feet |
| Width of a Unit Grate | $W_o$ = | N/A | N/A | feet |
| Area Opening Ratio for a Grate (typical values 0.15-0.90) | $A_{ratio}$ = | N/A | N/A | |
| Clogging Factor for a Single Grate (typical value 0.50 - 0.70) | $C_f$ (G) = | N/A | N/A | |
| Grate Weir Coefficient (typical value 2.15 - 3.60) | $C_w$ (G) = | N/A | N/A | |
| Grate Orifice Coefficient (typical value 0.60 - 0.80) | $C_o$ (G) = | N/A | N/A | |
| **Curb Opening Information** | | MINOR | MAJOR | |
| Length of a Unit Curb Opening | $L_o$ (C) = | 5.00 | 5.00 | feet |
| Height of Vertical Curb Opening in Inches | $H_{vert}$ = | 6.00 | 6.00 | inches |
| Height of Curb Orifice Throat in Inches | $H_{throat}$ = | 6.00 | 6.00 | inches |
| Angle of Throat (see USDCM Figure ST-5) | Theta = | 63.40 | 63.40 | degrees |
| Side Width for Depression Pan (typically the gutter width of 2 feet) | $W_p$ = | 2.00 | 2.00 | feet |
| Clogging Factor for a Single Curb Opening (typical value 0.10) | $C_f$ (C) = | 0.10 | 0.10 | |
| Curb Opening Weir Coefficient (typical value 2.3-3.7) | $C_w$ (C) = | 3.60 | 3.60 | |
| Curb Opening Orifice Coefficient (typical value 0.60 - 0.70) | $C_o$ (C) = | 0.67 | 0.67 | |
| **Low Head Performance Reduction (Calculated)** | | MINOR | MAJOR | |
| Depth for Grate Midwidth | $d_{Grate}$ = | N/A | N/A | ft |
| Depth for Curb Opening Weir Equation | $d_{Curb}$ = | 0.17 | 0.31 | ft |
| Combination Inlet Performance Reduction Factor for Long Inlets | $RF_{Combination}$ = | 0.38 | 0.54 | |
| Curb Opening Performance Reduction Factor for Long Inlets | $RF_{Curb}$ = | 0.64 | 0.77 | |
| Grated Inlet Performance Reduction Factor for Long Inlets | $RF_{Grate}$ = | N/A | N/A | |
| | | MINOR | MAJOR | |
| Total Inlet Interception Capacity (assumes clogged condition) | $Q_a$ = | 3.9 | 11.7 | cfs |
| WARNING: Inlet Capacity less than Q Peak for Minor Storm | $Q_{PEAK\ REQUIRED}$ = | 3.9 | 9.8 | cfs |

# ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: Coyote Creek Filing No. 4

Inlet ID: Inlet 2




Gutter Geometry:

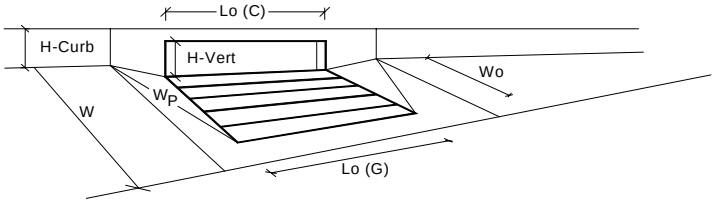
| | | | |
|---|---|---|---|
| Maximum Allowable Width for Spread Behind Curb | $T_{BACK}$ = | 7.0 | ft |
| Side Slope Behind Curb (leave blank for no conveyance credit behind curb) | $S_{BACK}$ = | 0.020 | ft/ft |
| Manning's Roughness Behind Curb (typically between 0.012 and 0.020) | $n_{BACK}$ = | 0.012 | |
| Height of Curb at Gutter Flow Line | $H_{CURB}$ = | 4.00 | inches |
| Distance from Curb Face to Street Crown | $T_{CROWN}$ = | 18.0 | ft |
| Gutter Width | W = | 2.00 | ft |
| Street Transverse Slope | $S_X$ = | 0.020 | ft/ft |
| Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft) | $S_W$ = | 0.083 | ft/ft |
| Street Longitudinal Slope - Enter 0 for sump condition | $S_O$ = | 0.000 | ft/ft |
| Manning's Roughness for Street Section (typically between 0.012 and 0.020) | $n_{STREET}$ = | 0.012 | |

| | | Minor Storm | Major Storm | |
|---|---|---|---|---|
| Max. Allowable Spread for Minor & Major Storm | $T_{MAX}$ = | 18.0 | 18.0 | ft |
| Max. Allowable Depth at Gutter Flowline for Minor & Major Storm | $d_{MAX}$ = | 4.0 | 5.7 | inches |
| Check boxes are not applicable in SUMP conditions | | ☐ | ☐ | |

| | | Minor Storm | Major Storm | |
|---|---|---|---|---|
| MINOR STORM Allowable Capacity is based on Depth Criterion | | | | |
| MAJOR STORM Allowable Capacity is based on Depth Criterion | $Q_{allow}$ = | SUMP | SUMP | cfs |

# INLET IN A SUMP OR SAG LOCATION

*MHFD-Inlet, Version 5.01 (April 2021)*



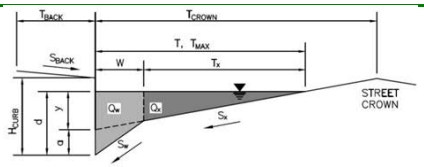

| Design Information (Input) | | MINOR | MAJOR | |
|---|---|---|---|---|
| Type of Inlet | Type = | CDOT Type R Curb Opening | | |
| Local Depression (additional to continuous gutter depression 'a' from above) | $a_{local}$ = | 5.00 | 5.00 | inches |
| Number of Unit Inlets (Grate or Curb Opening) | No = | 3 | 3 | |
| Water Depth at Flowline (outside of local depression) | Ponding Depth = | 4.0 | 5.7 | inches |
| **Grate Information** | | MINOR | MAJOR | ☐ Override Depths |
| Length of a Unit Grate | $L_o$ (G) = | N/A | N/A | feet |
| Width of a Unit Grate | $W_o$ = | N/A | N/A | feet |
| Area Opening Ratio for a Grate (typical values 0.15-0.90) | $A_{ratio}$ = | N/A | N/A | |
| Clogging Factor for a Single Grate (typical value 0.50 - 0.70) | $C_f$ (G) = | N/A | N/A | |
| Grate Weir Coefficient (typical value 2.15 - 3.60) | $C_w$ (G) = | N/A | N/A | |
| Grate Orifice Coefficient (typical value 0.60 - 0.80) | $C_o$ (G) = | N/A | N/A | |
| **Curb Opening Information** | | MINOR | MAJOR | |
| Length of a Unit Curb Opening | $L_o$ (C) = | 5.00 | 5.00 | feet |
| Height of Vertical Curb Opening in Inches | $H_{vert}$ = | 6.00 | 6.00 | inches |
| Height of Curb Orifice Throat in Inches | $H_{throat}$ = | 6.00 | 6.00 | inches |
| Angle of Throat (see USDCM Figure ST-5) | Theta = | 63.40 | 63.40 | degrees |
| Side Width for Depression Pan (typically the gutter width of 2 feet) | $W_p$ = | 2.00 | 2.00 | feet |
| Clogging Factor for a Single Curb Opening (typical value 0.10) | $C_f$ (C) = | 0.10 | 0.10 | |
| Curb Opening Weir Coefficient (typical value 2.3-3.7) | $C_w$ (C) = | 3.60 | 3.60 | |
| Curb Opening Orifice Coefficient (typical value 0.60 - 0.70) | $C_o$ (C) = | 0.67 | 0.67 | |
| **Low Head Performance Reduction (Calculated)** | | MINOR | MAJOR | |
| Depth for Grate Midwidth | $d_{Grate}$ = | N/A | N/A | ft |
| Depth for Curb Opening Weir Equation | $d_{Curb}$ = | 0.17 | 0.31 | ft |
| Combination Inlet Performance Reduction Factor for Long Inlets | $RF_{Combination}$ = | 0.38 | 0.54 | |
| Curb Opening Performance Reduction Factor for Long Inlets | $RF_{Curb}$ = | 0.64 | 0.77 | |
| Grated Inlet Performance Reduction Factor for Long Inlets | $RF_{Grate}$ = | N/A | N/A | |
| | | MINOR | MAJOR | |
| Total Inlet Interception Capacity (assumes clogged condition) | $Q_a$ = | 3.9 | 11.7 | cfs |
| Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK) | $Q_{PEAK\ REQUIRED}$ = | 3.8 | 8.8 | cfs |

# ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: Coyote Creek Filing No. 4

Inlet ID: Inlet 3




**Gutter Geometry:**

| | | | |
|---|---|---|---|
| Maximum Allowable Width for Spread Behind Curb | $T_{BACK}$ = | 7.0 | ft |
| Side Slope Behind Curb (leave blank for no conveyance credit behind curb) | $S_{BACK}$ = | 0.020 | ft/ft |
| Manning's Roughness Behind Curb (typically between 0.012 and 0.020) | $n_{BACK}$ = | 0.012 | |
| Height of Curb at Gutter Flow Line | $H_{CURB}$ = | 4.00 | inches |
| Distance from Curb Face to Street Crown | $T_{CROWN}$ = | 18.0 | ft |
| Gutter Width | W = | 2.00 | ft |
| Street Transverse Slope | $S_X$ = | 0.020 | ft/ft |
| Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft) | $S_W$ = | 0.083 | ft/ft |
| Street Longitudinal Slope - Enter 0 for sump condition | $S_O$ = | 0.008 | ft/ft |
| Manning's Roughness for Street Section (typically between 0.012 and 0.020) | $n_{STREET}$ = | 0.012 | |

| | | Minor Storm | Major Storm | |
|---|---|---|---|---|
| Max. Allowable Spread for Minor & Major Storm | $T_{MAX}$ = | 18.0 | 18.0 | ft |
| Max. Allowable Depth at Gutter Flowline for Minor & Major Storm | $d_{MAX}$ = | 4.0 | 5.7 | inches |
| Allow Flow Depth at Street Crown (check box for yes, leave blank for no) | | ☐ | ☐ | |

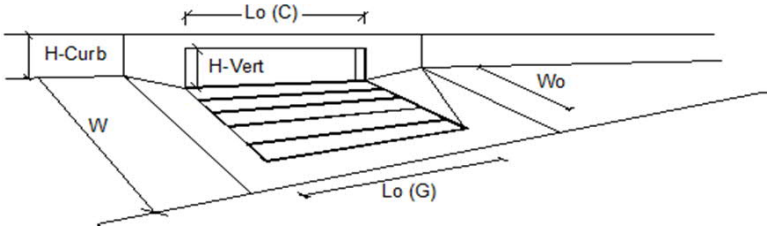
| | | Minor Storm | Major Storm | |
|---|---|---|---|---|
| MINOR STORM Allowable Capacity is based on Depth Criterion | | | | |
| MAJOR STORM Allowable Capacity is based on Depth Criterion | $Q_{allow}$ = | 4.0 | 15.0 | cfs |

Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

# INLET ON A CONTINUOUS GRADE

*MHFD-Inlet, Version 5.01 (April 2021)*




| Design Information (Input) | | MINOR | MAJOR | |
|---|---|---|---|---|
| Type of Inlet | Type = | CDOT Type R Curb Opening | | |
| Local Depression (additional to continuous gutter depression 'a') | $a_{LOCAL}$ = | 5.0 | 5.0 | inches |
| Total Number of Units in the Inlet (Grate or Curb Opening) | No = | 2 | 2 | |
| Length of a Single Unit Inlet (Grate or Curb Opening) | $L_o$ = | 5.00 | 5.00 | ft |
| Width of a Unit Grate (cannot be greater than W, Gutter Width) | $W_o$ = | N/A | N/A | ft |
| Clogging Factor for a Single Unit Grate (typical min. value = 0.5) | $C_f$-G = | N/A | N/A | |
| Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1) | $C_f$-C = | 0.10 | 0.10 | |

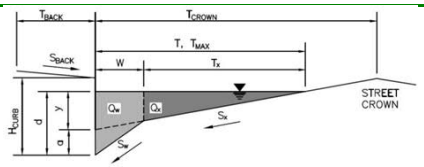
| Street Hydraulics: OK - Q < Allowable Street Capacity' | | MINOR | MAJOR | |
|---|---|---|---|---|
| Total Inlet Interception Capacity | Q = | 1.1 | 2.6 | cfs |
| Total Inlet Carry-Over Flow (flow bypassing inlet) | $Q_b$ = | 0.0 | 0.0 | cfs |
| Capture Percentage = $Q_a/Q_o$ = | C% = | 100 | 100 | % |

# ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: Coyote Creek Filing No. 4

Inlet ID: Inlet 4




Gutter Geometry:

| | | | |
|---|---|---|---|
| Maximum Allowable Width for Spread Behind Curb | $T_{BACK}$ = | 7.0 | ft |
| Side Slope Behind Curb (leave blank for no conveyance credit behind curb) | $S_{BACK}$ = | 0.020 | ft/ft |
| Manning's Roughness Behind Curb (typically between 0.012 and 0.020) | $n_{BACK}$ = | 0.012 | |
| Height of Curb at Gutter Flow Line | $H_{CURB}$ = | 4.00 | inches |
| Distance from Curb Face to Street Crown | $T_{CROWN}$ = | 18.0 | ft |
| Gutter Width | W = | 2.00 | ft |
| Street Transverse Slope | $S_X$ = | 0.020 | ft/ft |
| Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft) | $S_W$ = | 0.083 | ft/ft |
| Street Longitudinal Slope - Enter 0 for sump condition | $S_O$ = | 0.020 | ft/ft |
| Manning's Roughness for Street Section (typically between 0.012 and 0.020) | $n_{STREET}$ = | 0.012 | |

| | | Minor Storm | Major Storm | |
|---|---|---|---|---|
| Max. Allowable Spread for Minor & Major Storm | $T_{MAX}$ = | 18.0 | 18.0 | ft |
| Max. Allowable Depth at Gutter Flowline for Minor & Major Storm | $d_{MAX}$ = | 4.0 | 5.7 | inches |
| Allow Flow Depth at Street Crown (check box for yes, leave blank for no) | | ☐ | ☐ | |

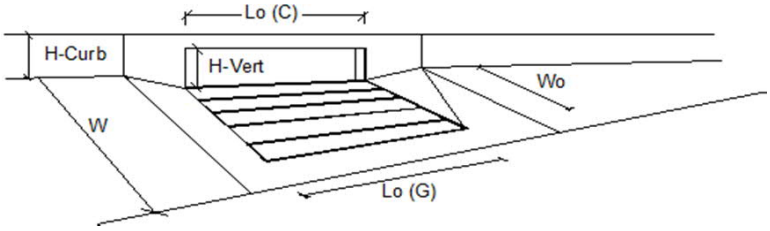
| | | Minor Storm | Major Storm | |
|---|---|---|---|---|
| MINOR STORM Allowable Capacity is based on Depth Criterion | | | | |
| MAJOR STORM Allowable Capacity is based on Depth Criterion | $Q_{allow}$ = | 6.4 | 23.7 | cfs |

Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

# INLET ON A CONTINUOUS GRADE

*MHFD-Inlet, Version 5.01 (April 2021)*




| Design Information (Input) | | MINOR | MAJOR | |
|---|---|---|---|---|
| Type of Inlet | Type = | CDOT Type R Curb Opening | | |
| Local Depression (additional to continuous gutter depression 'a') | $a_{LOCAL}$ = | 5.0 | 5.0 | inches |
| Total Number of Units in the Inlet (Grate or Curb Opening) | No = | 2 | 2 | |
| Length of a Single Unit Inlet (Grate or Curb Opening) | $L_o$ = | 5.00 | 5.00 | ft |
| Width of a Unit Grate (cannot be greater than W, Gutter Width) | $W_o$ = | N/A | N/A | ft |
| Clogging Factor for a Single Unit Grate (typical min. value = 0.5) | $C_f$-G = | N/A | N/A | |
| Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1) | $C_f$-C = | 0.10 | 0.10 | |

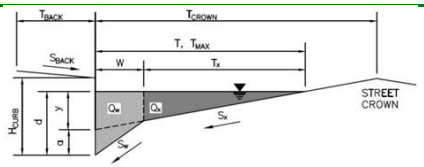
| Street Hydraulics: OK - Q < Allowable Street Capacity' | | MINOR | MAJOR | |
|---|---|---|---|---|
| Total Inlet Interception Capacity | Q = | 5.3 | 8.7 | cfs |
| Total Inlet Carry-Over Flow (flow bypassing inlet) | $Q_b$ = | 0.4 | 5.1 | cfs |
| Capture Percentage = $Q_a/Q_o$ = | C% = | 93 | 63 | % |

# ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: Coyote Creek Filing No. 4

Inlet ID: Inlet 5




Gutter Geometry:

| | | | |
|---|---|---|---|
| Maximum Allowable Width for Spread Behind Curb | $T_{BACK}$ = | 7.0 | ft |
| Side Slope Behind Curb (leave blank for no conveyance credit behind curb) | $S_{BACK}$ = | 0.020 | ft/ft |
| Manning's Roughness Behind Curb (typically between 0.012 and 0.020) | $n_{BACK}$ = | 0.012 | |
| Height of Curb at Gutter Flow Line | $H_{CURB}$ = | 4.00 | inches |
| Distance from Curb Face to Street Crown | $T_{CROWN}$ = | 18.0 | ft |
| Gutter Width | W = | 2.00 | ft |
| Street Transverse Slope | $S_X$ = | 0.020 | ft/ft |
| Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft) | $S_W$ = | 0.083 | ft/ft |
| Street Longitudinal Slope - Enter 0 for sump condition | $S_O$ = | 0.020 | ft/ft |
| Manning's Roughness for Street Section (typically between 0.012 and 0.020) | $n_{STREET}$ = | 0.012 | |

| | | Minor Storm | Major Storm | |
|---|---|---|---|---|
| Max. Allowable Spread for Minor & Major Storm | $T_{MAX}$ = | 18.0 | 18.0 | ft |
| Max. Allowable Depth at Gutter Flowline for Minor & Major Storm | $d_{MAX}$ = | 4.0 | 5.7 | inches |
| Allow Flow Depth at Street Crown (check box for yes, leave blank for no) | | ☐ | ☐ | |

MINOR STORM Allowable Capacity is based on Depth Criterion

MAJOR STORM Allowable Capacity is based on Depth Criterion

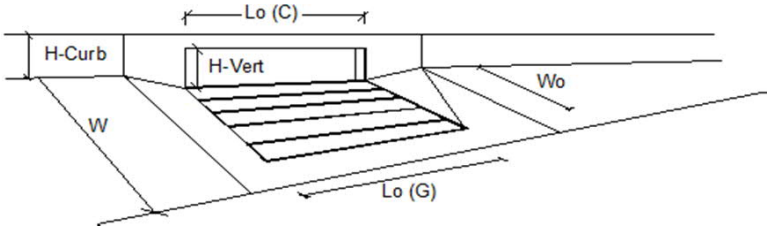
| | | Minor Storm | Major Storm | |
|---|---|---|---|---|
| | $Q_{allow}$ = | 6.4 | 23.7 | cfs |

WARNING: MINOR STORM max. allowable capacity is less than the design flow given on sheet 'Inlet Management'

Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

# INLET ON A CONTINUOUS GRADE

*MHFD-Inlet, Version 5.01 (April 2021)*



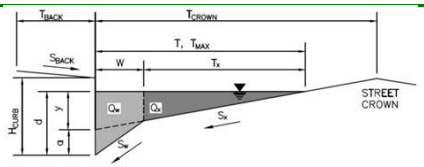

| Design Information (Input) | | MINOR | MAJOR | |
|---|---|---|---|---|
| Type of Inlet | Type = | CDOT Type R Curb Opening | | |
| Local Depression (additional to continuous gutter depression 'a') | $a_{LOCAL}$ = | 5.0 | 5.0 | inches |
| Total Number of Units in the Inlet (Grate or Curb Opening) | No = | 2 | 2 | |
| Length of a Single Unit Inlet (Grate or Curb Opening) | $L_o$ = | 5.00 | 5.00 | ft |
| Width of a Unit Grate (cannot be greater than W, Gutter Width) | $W_o$ = | N/A | N/A | ft |
| Clogging Factor for a Single Unit Grate (typical min. value = 0.5) | $C_f$-G = | N/A | N/A | |
| Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1) | $C_f$-C = | 0.10 | 0.10 | |
| **Street Hydraulics: WARNING: Q > ALLOWABLE Q FOR MINOR STORM'** | | MINOR | MAJOR | |
| Total Inlet Interception Capacity | Q = | 5.8 | 9.3 | cfs |
| Total Inlet Carry-Over Flow (flow bypassing inlet) | $Q_b$ = | 0.6 | 6.8 | cfs |
| Capture Percentage = $Q_a/Q_o$ = | C% = | 90 | 58 | % |

# ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: Coyote Creek Filing No. 4

Inlet ID: Inlet 6




Gutter Geometry:

| | | | |
|---|---|---|---|
| Maximum Allowable Width for Spread Behind Curb | $T_{BACK}$ = | 7.0 | ft |
| Side Slope Behind Curb (leave blank for no conveyance credit behind curb) | $S_{BACK}$ = | 0.020 | ft/ft |
| Manning's Roughness Behind Curb (typically between 0.012 and 0.020) | $n_{BACK}$ = | 0.012 | |
| Height of Curb at Gutter Flow Line | $H_{CURB}$ = | 4.00 | inches |
| Distance from Curb Face to Street Crown | $T_{CROWN}$ = | 18.0 | ft |
| Gutter Width | W = | 2.00 | ft |
| Street Transverse Slope | $S_X$ = | 0.020 | ft/ft |
| Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft) | $S_W$ = | 0.083 | ft/ft |
| Street Longitudinal Slope - Enter 0 for sump condition | $S_O$ = | 0.008 | ft/ft |
| Manning's Roughness for Street Section (typically between 0.012 and 0.020) | $n_{STREET}$ = | 0.012 | |

| | | Minor Storm | Major Storm | |
|---|---|---|---|---|
| Max. Allowable Spread for Minor & Major Storm | $T_{MAX}$ = | 18.0 | 18.0 | ft |
| Max. Allowable Depth at Gutter Flowline for Minor & Major Storm | $d_{MAX}$ = | 4.0 | 5.7 | inches |
| Allow Flow Depth at Street Crown (check box for yes, leave blank for no) | | ☐ | ☐ | |

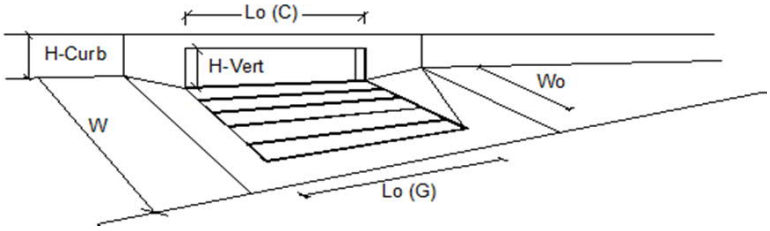
| | | Minor Storm | Major Storm | |
|---|---|---|---|---|
| MINOR STORM Allowable Capacity is based on Depth Criterion | | | | |
| MAJOR STORM Allowable Capacity is based on Depth Criterion | $Q_{allow}$ = | 4.0 | 15.0 | cfs |

Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

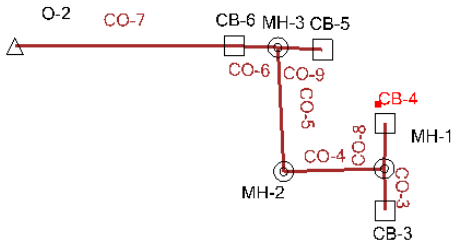
# INLET ON A CONTINUOUS GRADE

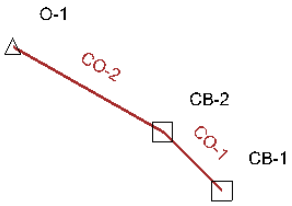
*MHFD-Inlet, Version 5.01 (April 2021)*




| Design Information (Input) | | MINOR | MAJOR | |
|---|---|---|---|---|
| Type of Inlet | Type = | CDOT Type R Curb Opening | | |
| Local Depression (additional to continuous gutter depression 'a') | $a_{LOCAL}$ = | 5.0 | 5.0 | inches |
| Total Number of Units in the Inlet (Grate or Curb Opening) | No = | 2 | 2 | |
| Length of a Single Unit Inlet (Grate or Curb Opening) | $L_o$ = | 5.00 | 5.00 | ft |
| Width of a Unit Grate (cannot be greater than W, Gutter Width) | $W_o$ = | N/A | N/A | ft |
| Clogging Factor for a Single Unit Grate (typical min. value = 0.5) | $C_f$-G = | N/A | N/A | |
| Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1) | $C_f$-C = | 0.10 | 0.10 | |

| Street Hydraulics: OK - Q < Allowable Street Capacity' | | MINOR | MAJOR | |
|---|---|---|---|---|
| Total Inlet Interception Capacity | Q = | 1.0 | 7.8 | cfs |
| Total Inlet Carry-Over Flow (flow bypassing inlet) | $Q_b$ = | 0.0 | 4.1 | cfs |
| Capture Percentage = $Q_a/Q_o$ = | C% = | 100 | 66 | % |


O-2
CO-7
CB-6
MH-3
CB-5
CO-6
CO-9
CO-5
CB-4
MH-1
CO-8
CO-4
CO-3
MH-2
CB-3


O-1
CO-2
CB-2
CO-1
CB-1

## 100-Year Event

| Label | Elevation (Ground) (ft) | Elevation (Rim) (ft) | Elevation (Invert) (ft) | Hydraulic Grade Line (In) (ft) | Flow (Known) (cfs) |
|---|---|---|---|---|---|
| CB-1 | 4,916.18 | 4,916.18 | 4,912.50 | 4,914.52 | 9.80 |
| CB-2 | 4,916.20 | 4,916.20 | 4,912.30 | 4,914.17 | 18.60 |
| CB-3 | 4,915.28 | 4,915.28 | 4,911.86 | 4,913.75 | 8.70 |
| CB-4 | 4,914.84 | 4,914.84 | 4,911.84 | 4,913.74 | 9.30 |
| CB-5 | 4,914.25 | 4,914.25 | 4,911.13 | 4,913.05 | 7.80 |
| CB-6 | 4,914.26 | 4,914.26 | 4,910.82 | 4,912.42 | 28.40 |

## 100-Year Event

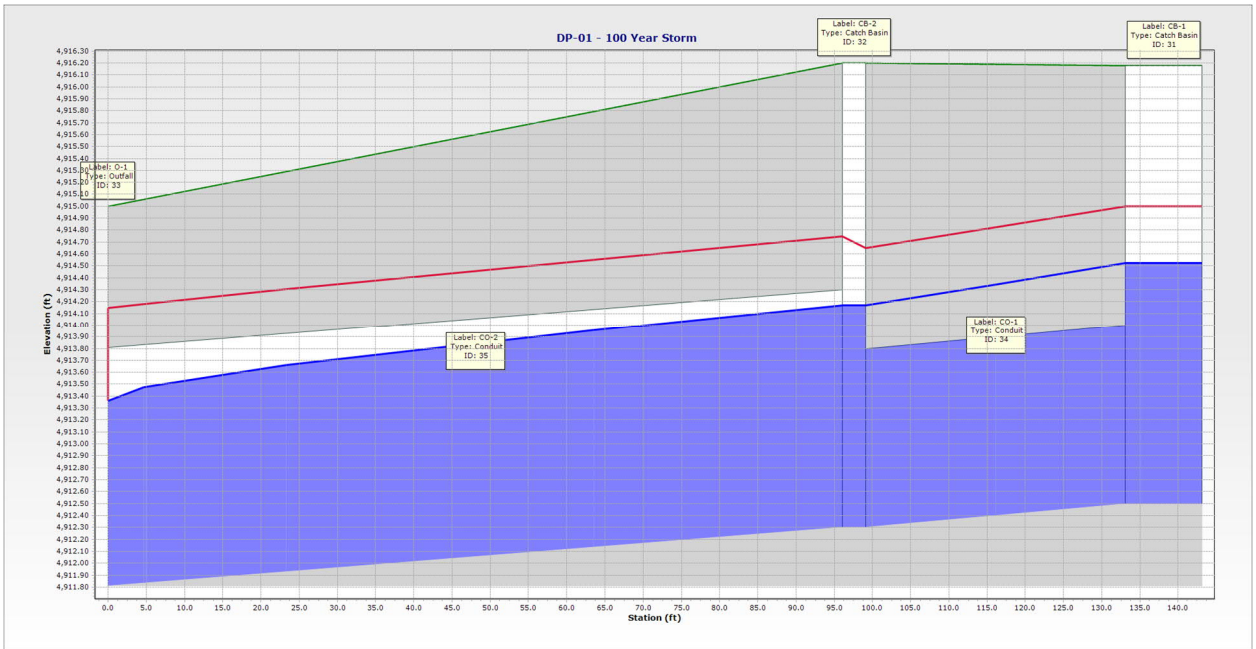
| Label | Diameter (in) | Manning's n | Invert (Start) (ft) | Invert (Stop) (ft) | Length (User Defined) (ft) | Slope (Calculated) (ft/ft) | Flow (cfs) | Velocity (ft/s) | Capacity (Full Flow) (cfs) | Hydraulic Grade Line (In) (ft) | Hydraulic Grade Line (Out) (ft) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO-1 | 18.0 | 0.013 | 4,912.50 | 4,912.30 | 40.5 | 0.005 | 9.80 | 5.55 | 7.38 | 4,914.52 | 4,914.17 |
| CO-2 | 24.0 | 0.013 | 4,912.30 | 4,911.81 | 97.6 | 0.005 | 18.60 | 5.92 | 16.03 | 4,914.17 | 4,913.36 |
| CO-3 | 18.0 | 0.013 | 4,911.86 | 4,911.55 | 20.9 | 0.015 | 8.70 | 4.92 | 12.79 | 4,913.75 | 4,913.61 |
| CO-4 | 24.0 | 0.013 | 4,911.55 | 4,911.32 | 45.9 | 0.005 | 18.00 | 5.73 | 16.01 | 4,913.61 | 4,913.32 |
| CO-5 | 24.0 | 0.013 | 4,911.32 | 4,910.91 | 61.0 | 0.007 | 18.00 | 6.73 | 18.55 | 4,913.32 | 4,912.93 |
| CO-6 | 24.0 | 0.013 | 4,910.91 | 4,910.82 | 16.4 | 0.005 | 25.80 | 8.21 | 16.75 | 4,912.93 | 4,912.60 |
| CO-7 | 24.0 | 0.013 | 4,910.82 | 4,910.27 | 137.1 | 0.004 | 28.40 | 5.20 | 28.66 | 4,912.42 | 4,911.63 |
| CO-8 | 18.0 | 0.013 | 4,911.84 | 4,911.55 | 16.4 | 0.018 | 9.30 | 5.26 | 13.96 | 4,913.74 | 4,913.61 |
| CO-9 | 18.0 | 0.013 | 4,911.13 | 4,910.91 | 20.9 | 0.011 | 7.80 | 4.41 | 10.77 | 4,913.05 | 4,912.93 |

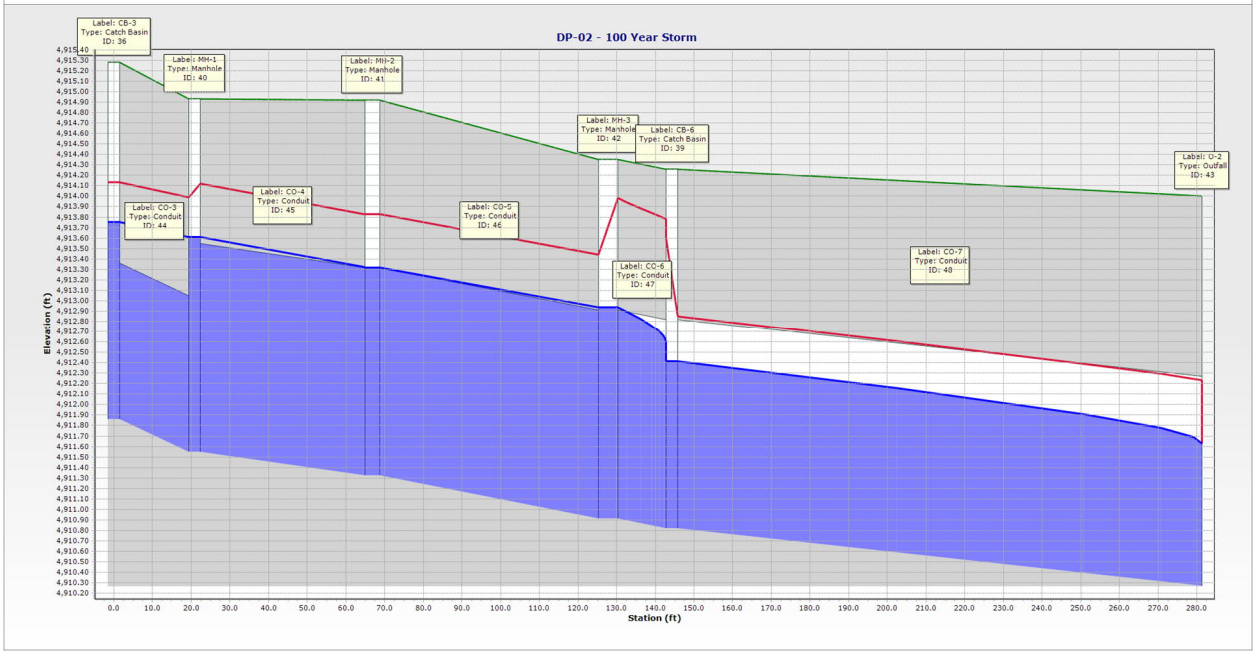
## 100-Year Event

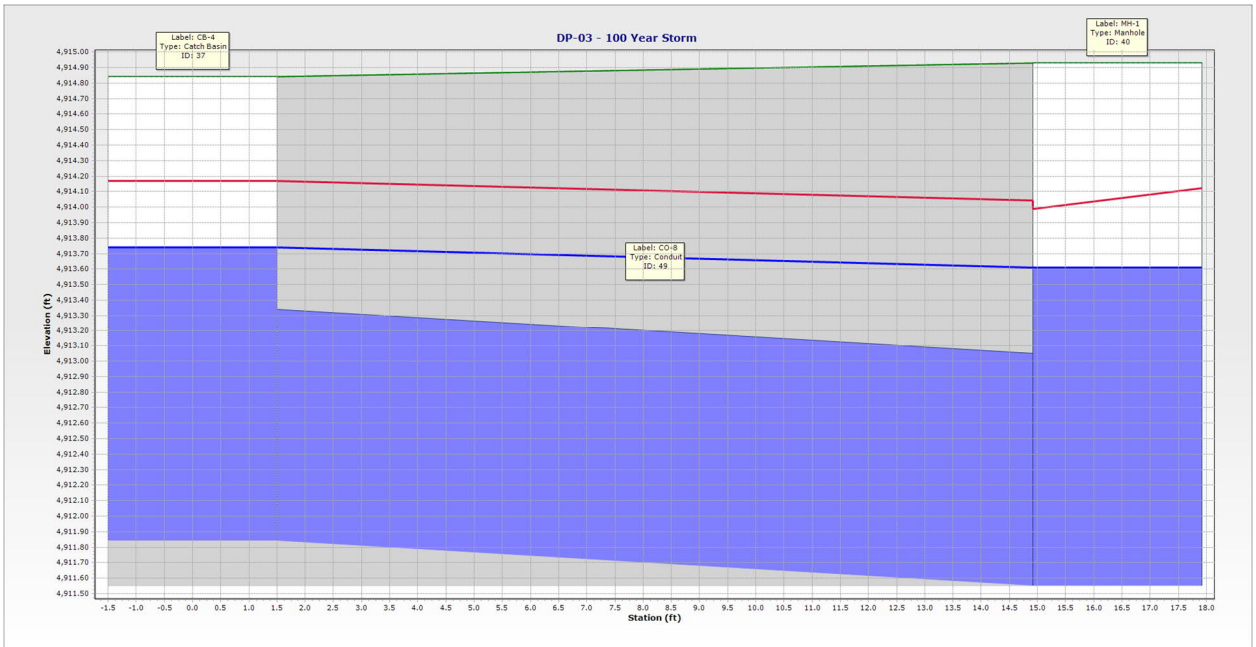
| Label | Flow (Total Out) (cfs) | Energy Grade Line (In) (ft) | Energy Grade Line (Out) (ft) | Hydraulic Grade Line (In) (ft) | Hydraulic Grade Line (Out) (ft) | Elevation (Ground) (ft) | Elevation (Invert) (ft) |
|---|---|---|---|---|---|---|---|
| MH-1 | 18.00 | 4,913.99 | 4,914.12 | 4,913.61 | 4,913.61 | 4,914.93 | 4,911.55 |
| MH-2 | 18.00 | 4,913.83 | 4,913.83 | 4,913.32 | 4,913.32 | 4,914.92 | 4,911.32 |
| MH-3 | 25.80 | 4,913.44 | 4,913.98 | 4,912.93 | 4,912.93 | 4,914.35 | 4,910.91 |

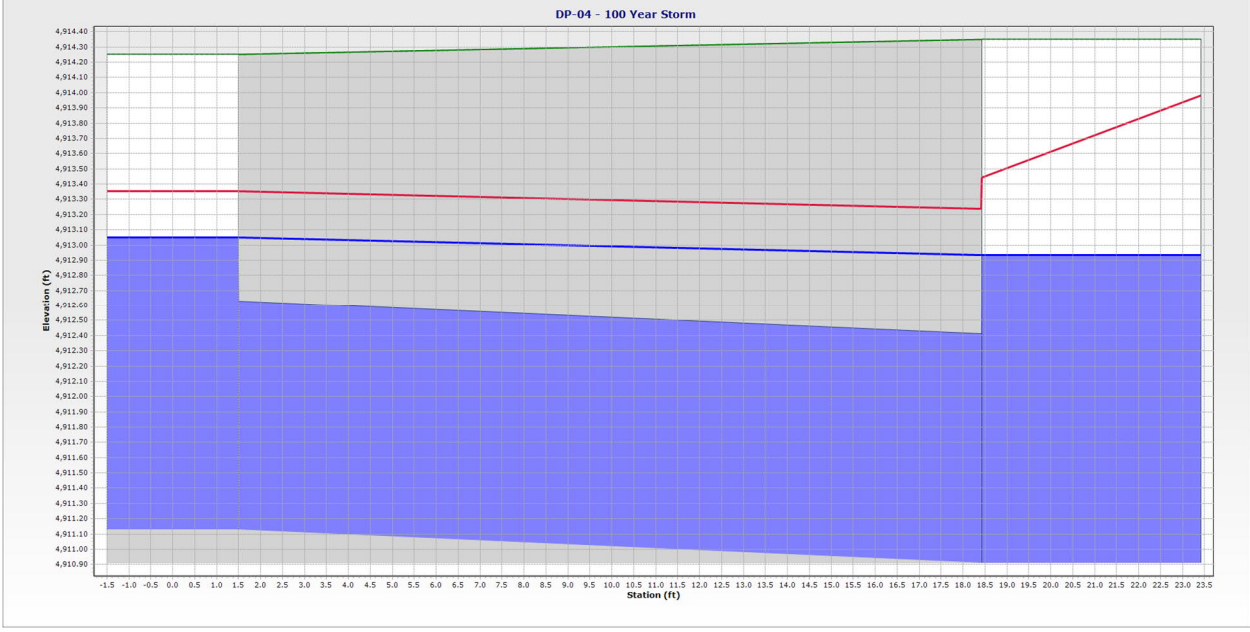
## 100-Year Event

| Label | Elevation (Ground) (ft) | Elevation (Invert) (ft) | Boundary Condition Type | Hydraulic Grade (ft) | Flow (Total Out) (cfs) |
|---|---|---|---|---|---|
| O-1 | 4,915.00 | 4,911.81 | Free Outfall | 4,913.36 | 18.60 |
| O-2 | 4,914.00 | 4,910.27 | Free Outfall | 4,911.63 | 28.40 |


DP-01 - 100 Year Storm
Label: CB-2
Type: Catch Basin
ID: 32
Label: CB-1
Type: Catch Basin
ID: 31
Label: O-1
Type: Outfall
ID: 33
Label: CO-2
Type: Conduit
ID: 35
Label: CO-1
Type: Conduit
ID: 34
Elevation (ft)
Station (ft)


DP-02 - 100 Year Storm
Label: CB-3
Type: Catch Basin
ID: 36
Label: MH-1
Type: Manhole
ID: 40
Label: MH-2
Type: Manhole
ID: 41
Label: MH-3
Type: Manhole
ID: 42
Label: CB-6
Type: Catch Basin
ID: 39
Label: O-2
Type: Outfall
ID: 43
Label: CO-3
Type: Conduit
ID: 44
Label: CO-4
Type: Conduit
ID: 45
Label: CO-5
Type: Conduit
ID: 46
Label: CO-6
Type: Conduit
ID: 47
Label: CO-7
Type: Conduit
ID: 48
Elevation (ft)
Station (ft)


DP-03 - 100 Year Storm
Label: CB-4
Type: Catch Basin
ID: 37
Label: MH-1
Type: Manhole
ID: 40
Label: CO-8
Type: Conduit
ID: 49
Elevation (ft)
Station (ft)


DP-04 - 100 Year Storm
Elevation (ft)
Station (ft)

# Appendix D
# Coyote Creek Master Drainage Report Reference

# COYOTE CREEK
# MASTER DRAINAGE STUDY

SEPTEMBER 12, 1996

Prepared by:

**MERRICK & COMPANY**

MERRICK
Engineers & Architects

Coyote Creek PUD

# FT. LUPTON
# MASTER DRAINAGE STUDY

SEPTEMBER 12, 1996

JOB NO. 18012519
PHASE CODE 15051320
WBS CODE 1.1.4

PREPARED FOR:

NICHOLSON ENTERPRISES, INC.
MR. JIM NICHOLSON
5400 S. SYRACUSE ST., SUITE 100
ENGLEWOOD, CO 80111
(303) 770-6604

PREPARED BY:

MERRICK AND COMPANY
(2450 SOUTH PEORIA STREET)
P.O. BOX 22026
DENVER, CO 80222
(303)751-0741

**FT. LUPTON**
**MASTER DRAINAGE STUDY**
FT. LUPTON, CO
SEPTEMBER 12, 1996

## I. GENERAL LOCATION AND DESCRIPTION

The proposed Ft. Lupton Home Development consists of three single family subdivisions and one apartment subdivision containing a total of a 114 acres. The land was recently annexed into the City of Ft. Lupton from Weld County. It is located due east of the center of Ft. Lupton and is contained within the northwest one-quarter of Section 4 and the northeast one-quarter of Section 5, Township 1 North, Range 66 West of the 6th Principal Meridian. Primarily, it is bounded by State Highway 52 on the south, 9th Street on the north, an existing drainage ditch on the east, and College Ave. (a.k.a. 2950 Road) on the east. Aims Community College comprises a very small portion of the offsite drainage basin east of College Ave.. Other existing features are a water tank on the east side of the site, a farm house on the south, and Twombly Primary School at the northwest corner of the site. Separate from these parcels, but surrounding them is the Ft. Lupton Golf Course - now under construction.

The site is covered with native grasses and weeds. The major drainageway is the ditch flowing from south to north along the west property line. This ditch is trapezoidal in shape, with a top width of 20 feet, a bottom width of 5 feet and a depth of approximately 3 feet. An irrigation facility known as the Fulton Ditch winds its way through the center of the site from south to north. The development is shown on the Flood Insurance Rate Map as Zone C - defined by FEMA as an area of minimal flooding. The Federal Emergency Management Agency has not plotted any floodplains for this site.

## II. DRAINAGE BASINS AND SUB-BASINS

The City of Fort Lupton has no flood insurance rate maps according to the Federal Emergency Management Agency computer data base. The site is shown on the Weld County, Colorado Flood Insurance Rate Map Index. It is located on panel number 080266 0869 C which is not printed due to the area being in Zone C (area of minimal flooding). No other major drainageway planning studies of the area exist.

The drainage basin consists of sandy clay soils generally. The drainage flows from east to west at a 2% slope. Because the site is located along the easterly city limits, there are no planned land uses outside of the development other than the existing uses.

The Fulton Ditch is an irrigation facility which flows from south to north through the center of the site. The Fulton Ditch Manager, Mr. Lysle Dirrim, was contacted to determine site drainage requirements in relation to the ditch. He initially said the 10-year developed flow needs to be piped below the ditch. This requirement has recently changed to allowing no runoff from the sites to enter the ditch. A permit for crossing the ditch is required. A reinforced concrete pipe crossing will not require a casing. All other pipe materials need a concrete or iron casing to

minimize puncture and crushing problems and to allow the inner pipe to be extracted without interfering with the ditch. Concrete cutoff walls are required on both sides of the ditch to a depth of 3.5' to 4' below the pipe. It is preferable to cross with the pipe 3.5' below the ditch. The ditch engineer, Mr. Coby Haden with Rocky Mountain Consultants, will make any decisions if inverted siphon crossings are contemplated.

The overall site and golf course can be divided into two main drainage basins - a northerly and a southerly basin. The basins are divided by a ridge which is pronounced near the east side of the property and becomes less pronounced near the west portion of the property. Runoff from both basins flows from east to west.

One substantial offsite basin is tributary to the site. It is a long, thin basin approximately 2 miles long adjacent to the north side of State Highway 52. This basin contains 137.74 acres. Because this basin is virtually undeveloped, it very rarely generates any runoff. However, during the major storms, runoff from this basin will accumulate at the intersection of State Highway 52 and College Ave, due to the lack of any culverts at the intersection. Runoff will build up to a depth of approximately 2 feet before overtopping and flowing westerly along the southerly boundary of one of the residential subdivisions.

The drainage philosophy developed by the City of Ft. Lupton calls for separating the drainage of the residential sites from the golf course. The golf course will be required to retain all of their runoff on the golf course for all events up to a maximum of the 100-year storm. The residential sites will not be allowed to release any runoff onto the golf course. Detention ponding will not be required for the residential sites. These constraints set up the drainage scheme for the residential sites of routing the 100-year developed storm in storm sewer and streets. The City of Ft. Lupton will construct a regional detention pond downstream of the site in the future to include detention for the residential sites.

## III. DRAINAGE FACILITY DESIGN

The site was divided into 24 site basins and one offsite basin. Runoff from the offsite basin was discussed above. The southerly lots of basin A2 will be built up to confine the offsite flows into the State Highway 52 right-of-way while allowing the entire lot depth to drain to the proposed residential street. This regrading of the lots creates a substantial low point in the street at design points 1 and 2. The storm sewer and inlets have been sized to capture the 100-year storm from basins A1 and A2 at these two design points.

Inlets and storm sewer were also sized for the 100-year storm for basins D1, D2 and D3. This is to prevent any of the residential runoff from flowing onto the golf course as mandated by the City of Ft. Lupton. The storm sewer for these basins will be routed across the golf course and will require an easement.

Inlets and storm sewer for the remaining 19 basins were sized for the 5-year storm. Combining the 5-year and 100-year storm flows in the same storm sewer results in the pipe carrying a maximum flow of 119.29 cfs from design point 21 to the outlet. The 100-year storm for all of the contributing basins at this same point is 223.01 cfs. Subtracting 119.29 from 223.01 results in a maximum overland street flow of 103.72 cfs in the residential streets. The maximum allowable overland flow in a street sloped at 0.5% is 112 cfs for the 100-year storm according to the Ft. Lupton Standards. Although the allowable street capacity is not exceeded, a method will have

to be devised to get the 100-year overland street flow into the existing ditch running along the westerly boundary line of the site. This is in order to prevent the runoff from continuing to the west and adversely impacting adjacent land. This street flow could be routed into the ditch by forcing a sump vertical curve into the street at the westerly boundary line which would force the storm water to turn north. Another method would be to increase the inlet and storm sewer sizes to capture the entire 100-year storm sewer into the pipe - an expensive alternative.

It is our understanding that the City of Ft. Lupton will ultimately construct a regional detention pond north of the school and 100-year developed storm sewer pipe to be extended to this site. If this does not happen in a timely manner, the residential subdivision(s) will be required by the City to construct a temporary detention facility on the future apartment development land and/or the golf course. A basin by basin theoretical detention pond volume requirement table is included for information only. These volumes can be added in any manner for temporary detention pond sizing depending on the phasing of the project.

## IV. WETLAND DETERMINATION AND REVIEW

Mr. Terry McKee with the Army Corps of Engineers has been contacted to locate any wetlands on the site. His letter of response on April 4, 1996 indicated that no wetlands exist on the project. A copy of the letter is included in this report.

## V. REFERENCES

This report has been prepared in conformance with the "City of Fort Lupton Standards and Specifications for the Design and Construction of Public Improvements" dated 1994.

## VI. CONCLUSION

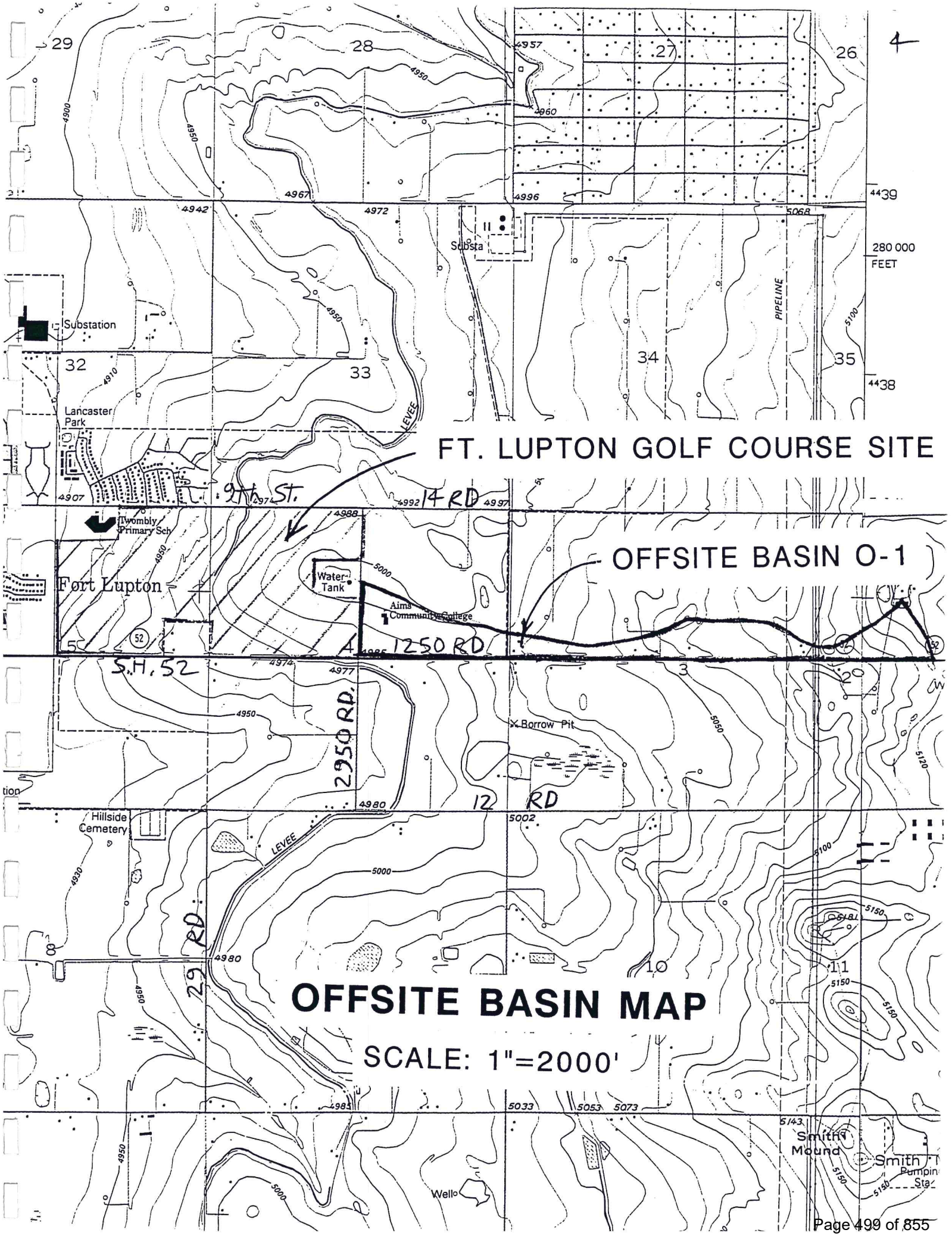
This drainage report has presented general drainage characteristics for the Ft. Lupton Master Drainage Plan, as well as some detention options and storm piping options. This report is intended to lay out the overall drainage philosophy of the project on a preliminary basis. If no changes are made to the residential sites, it can be used on a final basis with the exception of how overland street flow is transferred to the ditch at the westerly boundary line and assuming no major changes in slope are made over the existing condition. However, it is anticipated that lot layouts and street alignments will change as well as grading changes. In that case, the changes will take place with the Phase II or Phase III Drainage Reports.

If you have any questions, please feel free to call.

Respectfully submitted,

**MERRICK & COMPANY**

Mark F. Ericson, P.E.
Project Engineer


FT. LUPTON GOLF COURSE SITE
OFFSITE BASIN O-1
OFFSITE BASIN MAP
SCALE: 1"=2000'
Substation
Lancaster Park
Twombly Primary Sch
Fort Lupton
Water Tank
Aims Community College
Hillside Cemetery
Borrow Pit
Smith Mound
PIPELINE
LEVEE
9th St.
14 RD
1250 RD
S.H. 52
2950 RD.
12 RD
29 RD
280 000 FEET

**DEPARTMENT OF THE ARMY**
CORPS OF ENGINEERS, OMAHA DISTRICT
TRI-LAKES PROJECT OFFICE, 9307 STATE HWY 121
LITTLETON, COLORADO 80123-6901

REPLY TO
ATTENTION OF

April 4, 1996

Mark F. Ericson
Merrick Engineers & Architects
P O Box 22026
Denver, Colorado 80222

Dear Mr. Ericson:

This letter concerns the Ft. Lupton Golf Course Wetlands which are located in the Northwest ¼ of Section 5, Township 1 North, Range 66 West, Weld County, Colorado.

Your project has been reviewed in accordance with Section 404 of the Clean Water Act under which the U.S. Army Corps of Engineers regulates the excavation and discharge of dredged and fill material into waters of the United States including wetlands.

Reference is made to a March 25, 1996 wetlands determination conducted by Mr. Terry McKee of this office. During Mr. McKee's site visit, it was found that no wetlands exist at this site.

This letter is to inform you that the proposed activity, assigned number 199680280, will not require a Department of the Army (DA) Permit.

Although a DA Permit will not be required for the project, this does not eliminate the requirement that other applicable federal, state, and local permits be obtained as required.

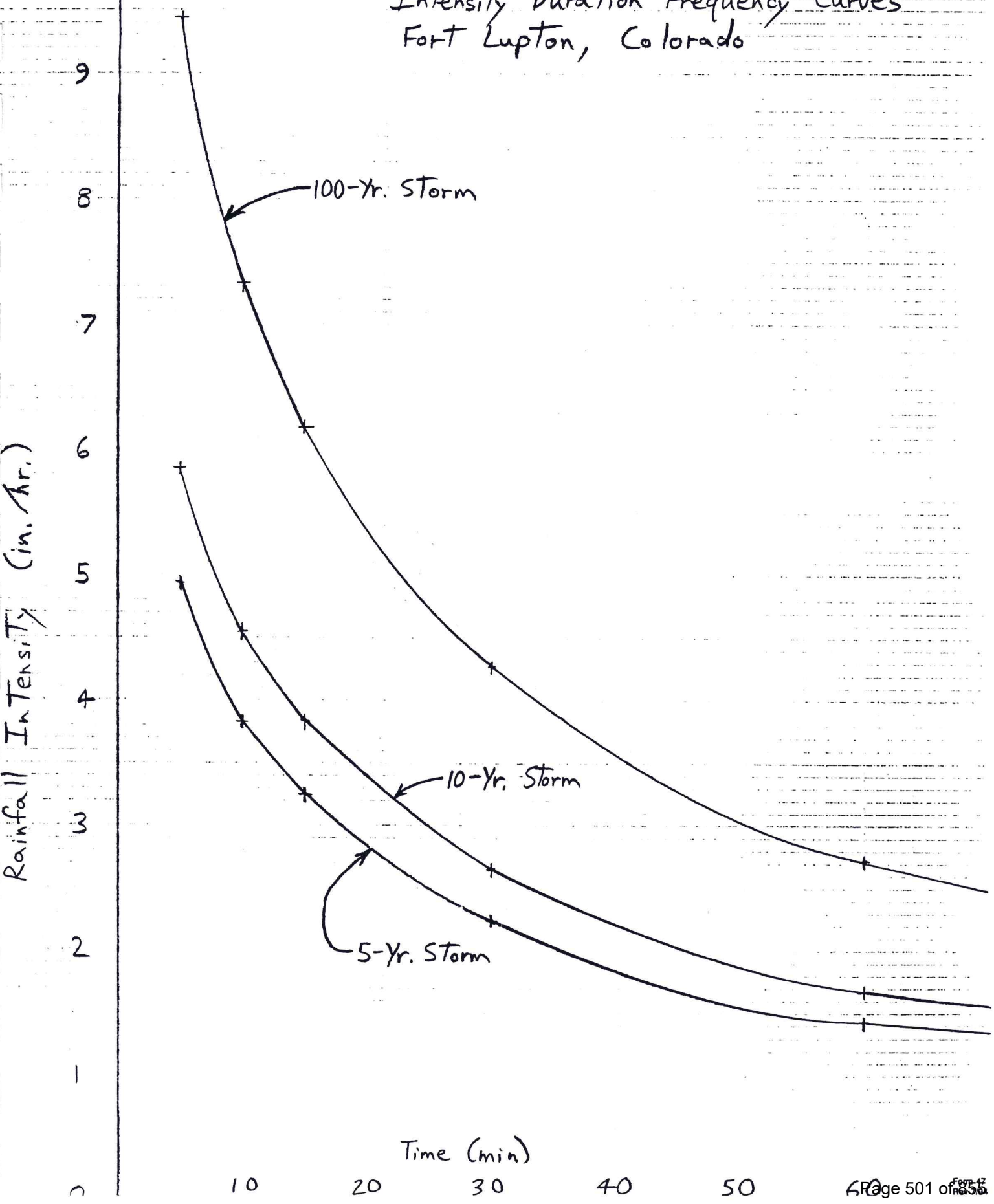
If there are any further questions concerning this matter, please feel free to contact Mr. Terry McKee of this office at 303-979-4120.

Sincerely,

Timothy T. Carey
Project Manager

Printed on Recycled Paper

# Intensity Duration Frequency Curves
## Fort Lupton, Colorado



NATIONAL FLOOD INSURANCE PROGRAM

# FIRM
## FLOOD INSURANCE RATE MAP

WELD COUNTY, COLORADO
(UNINCORPORATED AREAS)

# MAP INDEX

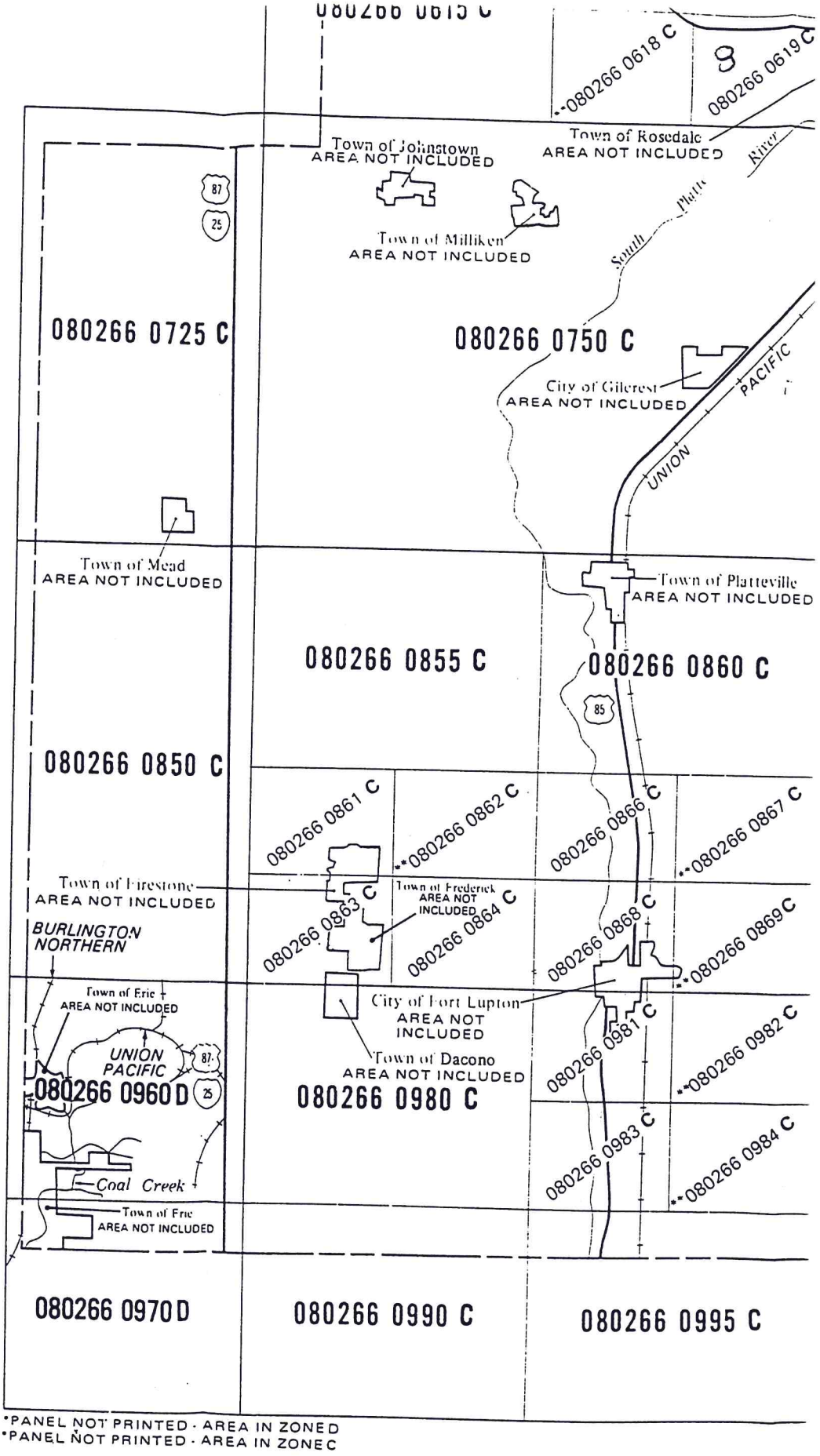
PANELS PRINTED: 75, 325, 475, 480, 485 - 489, 495, 605, 607 - 609, 615 - 617, 619, 626 -629, 635 - 639, 645, 675, 700, 725, 750, 775, 800, 825, 850, 855, 860, 861, 863, 864, 866, 868, 900, 925, 960, 970, 980, 981, 983, 990, 995, 1025

**COMMUNITY-PANEL NUMBERS**
080266 0001-1075

**MAP REVISED:**
SEPTEMBER 27, 1991

Rec ID.
G 008 000011

Ref ID.00015552




*PANEL NOT PRINTED - AREA IN ZONE D
**PANEL NOT PRINTED - AREA IN ZONE C

TABLE 3-1 (42)

RECOMMENDED RUNOFF COEFFICIENTS AND PERCENT IMPERVIOUS

| LAND USE OR SURFACE CHARACTERISTICS | PERCENT IMPERVIOUS | FREQUENCY 2 | 5 | 10 | 100 |
|---|---|---|---|---|---|
| Business: | | | | | |
| Commercial Areas | 95 | .87 | .87 | .88 | .89 |
| Neighborhood Areas | 70 | .60 | .65 | .70 | .80 |
| Residential: | | | | | |
| Single-Family | * | .40 | .45 | .50 | .60 |
| Multi-Unit (detached) | 50 | .45 | .50 | .60 | .70 |
| Multi-Unit (attached) | 70 | .60 | .65 | .70 | .80 |
| 1/2 Acre Lot or Larger | * | .30 | .35 | .40 | .60 |
| Apartments | 70 | .65 | .70 | .70 | .80 |
| Industrial: | | | | | |
| Light Areas | 80 | .71 | .72 | .76 | .82 |
| Heavy Acres | 90 | .80 | .80 | .85 | .90 |
| Parks, Cemetaries: | 7 | .10 | .18 | .25 | .45 |
| Playgrounds: | 13 | .15 | .20 | .30 | .50 |
| Schools: | 50 | .45 | .50 | .60 | .70 |
| Railroad Yard Areas | 20 | .20 | .25 | .35 | .45 |
| Undeveloped Areas: | | | | | |
| Historic Flow Analysis- Greenbelts, Agricultural | 2 | (See "Lawns") | | | |
| Offsite Flow Analysis (when land use not defined) | 45 | .43 | .47 | .55 | .65 |
| Streets: | | | | | |
| Paved | 100 | .87 | .88 | .90 | .93 |
| Gravel (Packed) | 40 | .40 | .45 | .50 | .60 |
| Drive and Walks: | 96 | .87 | .87 | .88 | .89 |
| Roofs: | 90 | .80 | .85 | .90 | .90 |
| Lawns, Sandy Soil | 0 | .00 | .01 | .05 | .20 |
| Lawns, Clayey Soil | 0 | .05 | .15 | .25 | .50 |

NOTE: These Rational Formula coefficients may not be valid for large basins.

*See Figure 2-1 for percent impervious.

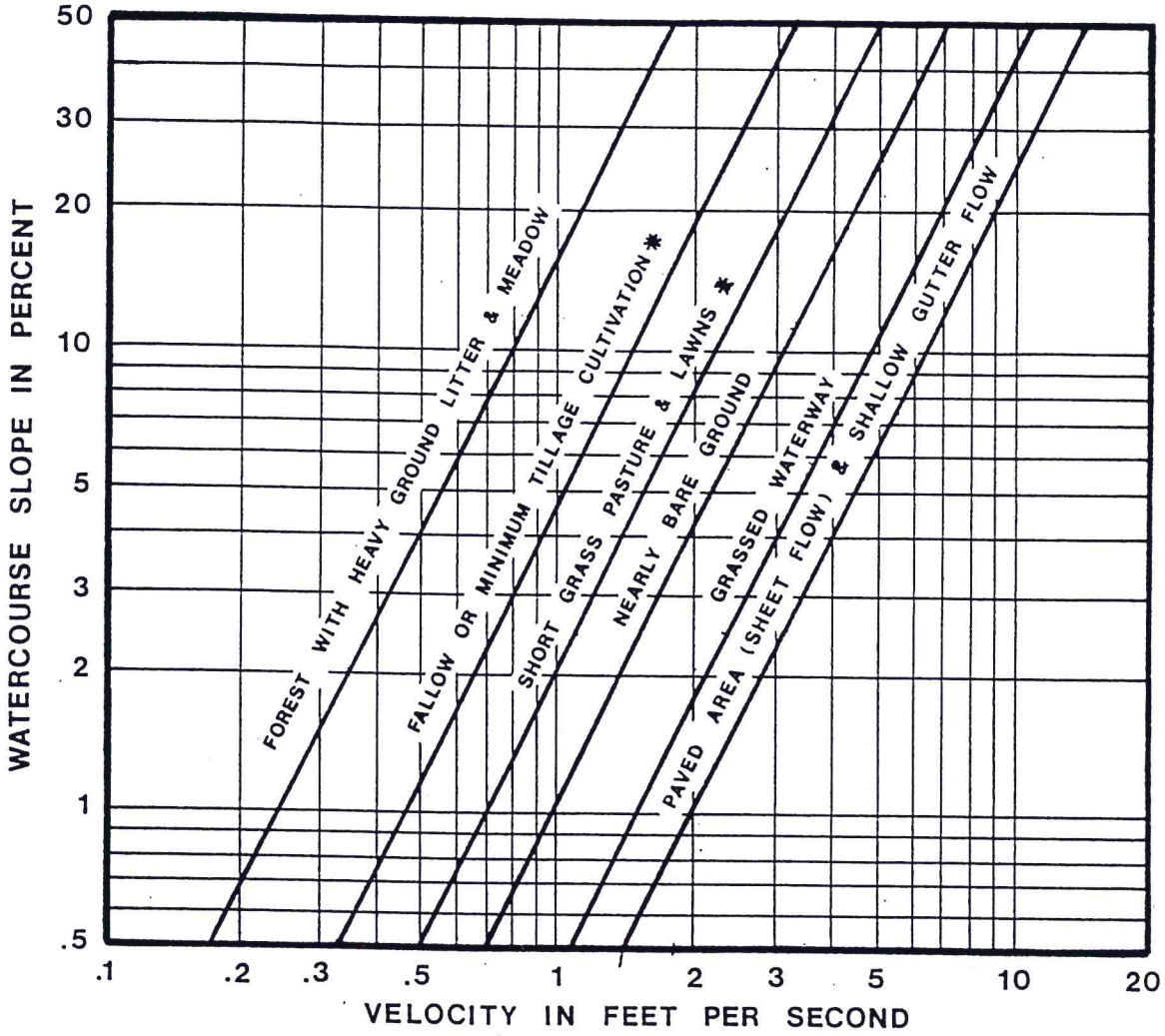



FIGURE 3-2. ESTIMATE OF AVERAGE FLOW VELOCITY FOR USE WITH THE RATIONAL FORMULA.

* MOST FREQUENTLY OCCURRING "UNDEVELOPED" LAND SURFACES IN THE DENVER REGION.

REFERENCE: "Urban Hydrology For Small Watersheds" Technical Release No. 55, USDA, SCS Jan. 1975.

CHANNEL CAPACITY CALCULATION

Ft. Lup Ton
Local Street

Cross Section: 0

NLOB: .025 STCHL: 2.5 NCHL: .016 STCHR: 47.5 NROB: .025

| STAT | ELEV | STAT | ELEV | STAT | ELEV | STAT | ELEV |
|---|---|---|---|---|---|---|---|
| 0.00 | 2.00 | 2.50 | 1.42 | 6.41 | 1.33 | 7.00 | 1.00 |
| 9.00 | 1.17 | 25.00 | 1.49 | 41.00 | 1.17 | 43.00 | 1.00 |
| 43.58 | 1.33 | 47.50 | 1.42 | 50.00 | 2.00 | 0.00 | 0.00 |

| CWSEL | EG | ELMIN | QLOB | QCH | QROB |
|---|---|---|---|---|---|
| Chan Vel | HV | KRATIO | ALOB | ACH | AROB |
| Depth | HL | Top Width | STAT-L | ST-MIDCH | STAT-R |
| Discharge | OL | Froude # | CH-Slope | EG-Slope | FlowRegim |
| 2.00 | 2.799 | 1.00 | 2 | 224 | 2 |
| 7.22 | 0.80 | 0.00 | 1 | 31 | 1 |
| 1.00 | 0.00 | 50 | 0.0 | 25.0 | 50.0 |
| 227 | 0.00 | 1.57 | 0.0100 | 0.0100 | --- |

$Q_{100}$ (Max. Allowable) with Reduction = 0.8(227) = 181.6 cfs
at 1% Slope (Total Street)
= 90.8 cfs (Each Gutter)
Agrees with chart

$Q_{100}$ (Max Allowable) with Reduction
= 2(56) = 112 cfs
at 0.5% Slope (Total Street)

CHANNEL CAPACITY CALCULATION

Cross Section: 0

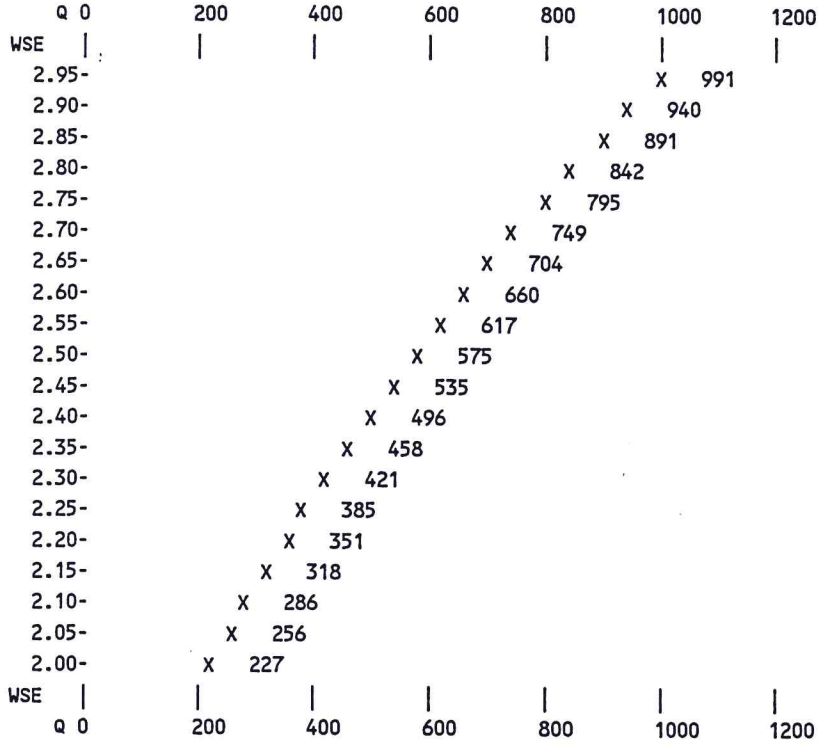
NLOB: .025 STCHL: 2.5 NCHL: .016 STCHR: 47.5 NROB: .025

| STAT | ELEV | STAT | ELEV | STAT | ELEV | STAT | ELEV |
|---|---|---|---|---|---|---|---|
| 0.00 | 2.00 | 2.50 | 1.42 | 6.41 | 1.33 | 7.00 | 1.00 |
| 9.00 | 1.17 | 25.00 | 1.49 | 41.00 | 1.17 | 43.00 | 1.00 |
| 43.58 | 1.33 | 47.50 | 1.42 | 50.00 | 2.00 | 0.00 | 0.00 |

SLOPE = .01

RATING CURVE

WATER SURFACE ELEVATION (in Feet NGVD) vs. DISCHARGE (in CFS)



# Ft. Lupton

$Q_5$ = 7.4 cfs / gutter max. @ 1% slope
= 4.2 cfs / gutter max. @ 0.5% slope
$Q_{100}$ = 92 cfs / gutter max @ 1% slope = 184 cfs Total
= 52 cfs / gutter max @ 0.5% slope = 104 cfs Total

Type R Inlet @ 0.44' Depth - Max. Q (cfs)

| Type R Size | 0.5% | 1.0% | Sump | Sump @ 12" |
|---|---|---|---|---|
| 5' | 3.1 | 3.4 | 4.2 | 11.8 |
| 10' | 4.2 | 5.7 | 8.5 | 23.9 |
| 15' | 4.6 | 6.5 | 13.9 | 28.9 |

# CUHP Input

## Offsite Basin O-1 - Historic

Area = 137.74 ac. = 0.215 SM

L = 1.89 mi.

Lc = 0.91 mi.

% Impervious = 2%

Slope = (5135 - 4985) / 10,000 = 0.015

Tc = N/A

Dep. Storage Pervious = 0.40 in.

Dep. Storage Impervious = 0.100 in.

Initial Infiltration = 3.000 in. Clay Soils

Decay = .0018

Final Infiltration = 0.500 in.

## Computer Results

Input File HFT0110Ø0.CHI

$Q_{100}$ = 98 cfs at $T_p$ = 70 min.

Input File HFT0100S.CHI

$Q_5$ = 26 cfs at $T_p$ = 70 min.

CUHP

HFT01005.CHI 15

```
2      FT. LUPTON OFFSITE BASIN O-1 - Historic Conditions - 8/28/96
01005-YEAR  005 1.42                                    0.000.000.000.00

70 1 15.0         1BASIN O-1*
.2151.8900.910 2.000.015 0.00 0.400.1003.000.00180.5000     0
E
```

U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE AT TIME HFT01005.CHO 16

CUHPE/PC VERSION MODIFIED IN JANUARY 1985

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

FT. LUPTON OFFSITE BASIN O-1 - Historic Conditions - 8/28/96

BASIN ID: -- BASIN COMMENT: BASIN O-1*

| AREA OF BASIN (SQMI) | LENGTH OF BASIN (MI) | DIST TO CENTROID (MI) | IMPERVIOUS AREA (PCT) | SLOPE (FT/FT) | UNIT DURATION (MIN) |
|---|---|---|---|---|---|
| .22 | 1.89 | .91 | 2.00 | .0150 | 5.00 |

| COEFFICIENT (REFLECTING TIME TO PEAK) | COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF) |
|---|---|
| .156 | .265 |

CALCULATED UNIT HYDROGRAPH

| TIME TO PEAK (MIN) | PEAK RATE OF RUNOFF (CFS/SQMI) | UNIT HYDROGRAP PEAK (CFS) | VOLUME OF RUNOFF (AF) |
|---|---|---|---|
| 35.68 | 306.80 | 65.96 | 11.47 |

WIDTH AT 50 = 98. MIN. WIDTH AT 75 = 51. MIN. K50 = .22 K75 = .30

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .40 IN. MAX. IMPERVIOUS RET. = .10 IN.
INFILTRATION = 3.00 IN./HR. DECAY = .00180/SECOND FNINFL = .50 IN./HR.

| TIME | UNIT HYDROGRAPH | TIME | UNIT HYDROGRAPH | TIME | UNIT HYDROGRAPH |
|---|---|---|---|---|---|
| 0. | 0. | 110. | 34. | 220. | 15. |
| 5. | 7. | 115. | 32. | 225. | 14. |
| 10. | 20. | 120. | 31. | 230. | 14. |
| 15. | 35. | 125. | 30. | 235. | 13. |
| 20. | 48. | 130. | 29. | 240. | 13. |
| 25. | 58. | 135. | 28. | 245. | 12. |
| 30. | 64. | 140. | 27. | 250. | 12. |
| 35. | 66. | 145. | 26. | 255. | 11. |
| 40. | 65. | 150. | 25. | 260. | 11. |
| 45. | 62. | 155. | 24. | 265. | 10. |
| 50. | 58. | 160. | 23. | 270. | 10. |
| 55. | 54. | 165. | 22. | 275. | 10. |
| 60. | 50. | 170. | 21. | 280. | 9. |
| 65. | 48. | 175. | 21. | 285. | 9. |
| 70. | 49. | 180. | 20. | 290. | 9. |
| 75. | 48. | 185. | 19. | 295. | 8. |
| 80. | 46. | 190. | 18. | 300. | 8. |
| 85. | 44. | 195. | 18. | 305. | 8. |
| 90. | 42. | 200. | 17. | 310. | 7. |
| 95. | 40. | 205. | 16. | 315. | 0. |

```
100.        38.    *   210.        16.    *     0.          0.    *
105.        36.    *   215.        15.    *     0.          0.    *
1       BASIN ID:          --  BASIN COMMENT:  BASIN 0-1*
```

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 005-YEAR

| TIME (MIN.) | INCREMENT RAINFALL (IN) | TOTAL EXCESS PRECIP | STORM HYDROGRAPH (CFS) | * | TIME (MIN.) | INCREMENT RAINFALL (IN) | TOTAL EXCESS PRECIP | STORM HYDROGRAPH (CFS) | * |
|---|---|---|---|---|---|---|---|---|---|
| 0. | .00 | .000 | 0. | * | 170. | .00 | .000 | 8. | * |
| 5. | .03 | .000 | 0. | * | 175. | .00 | .000 | 7. | * |
| 10. | .05 | .000 | 0. | * | 180. | .00 | .000 | 7. | * |
| 15. | .12 | .002 | 0. | * | 185. | .00 | .000 | 7. | * |
| 20. | .22 | .004 | 0. | * | 190. | .00 | .000 | 7. | * |
| 25. | .35 | .072 | 1. | * | 195. | .00 | .000 | 6. | * |
| 30. | .18 | .133 | 3. | * | 200. | .00 | .000 | 6. | * |
| 35. | .08 | .035 | 6. | * | 205. | .00 | .000 | 6. | * |
| 40. | .06 | .018 | 9. | * | 210. | .00 | .000 | 6. | * |
| 45. | .05 | .008 | 13. | * | 215. | .00 | .000 | 5. | * |
| 50. | .05 | .009 | 15. | * | 220. | .00 | .000 | 5. | * |
| 55. | .04 | .001 | 17. | * | 225. | .00 | .000 | 5. | * |
| 60. | .04 | .001 | 18. | * | 230. | .00 | .000 | 5. | * |
| 65. | .04 | .001 | 18. | * | 235. | .00 | .000 | 5. | * |
| 70. | .04 | .002 | 17. | * | 240. | .00 | .000 | 5. | * |
| 75. | .04 | .001 | 17. | * | 245. | .00 | .000 | 4. | * |
| 80. | .03 | .001 | 16. | * | 250. | .00 | .000 | 4. | * |
| 85. | .03 | .001 | 15. | * | 255. | .00 | .000 | 4. | * |
| 90. | .03 | .001 | 14. | * | 260. | .00 | .000 | 4. | * |
| 95. | .03 | .001 | 14. | * | 265. | .00 | .000 | 4. | * |
| 100. | .02 | .000 | 14. | * | 270. | .00 | .000 | 4. | * |
| 105. | .02 | .000 | 13. | * | 275. | .00 | .000 | 3. | * |
| 110. | .02 | .000 | 13. | * | 280. | .00 | .000 | 3. | * |
| 115. | .02 | .000 | 12. | * | 285. | .00 | .000 | 3. | * |
| 120. | .02 | .000 | 12. | * | 290. | .00 | .000 | 3. | * |
| 125. | .00 | .000 | 11. | * | 295. | .00 | .000 | 3. | * |
| 130. | .00 | .000 | 11. | * | 300. | .00 | .000 | 3. | * |
| 135. | .00 | .000 | 10. | * | 305. | .00 | .000 | 3. | * |
| 140. | .00 | .000 | 10. | * | 310. | .00 | .000 | 3. | * |
| 145. | .00 | .000 | 9. | * | 315. | .00 | .000 | 3. | * |
| 150. | .00 | .000 | 9. | * | 320. | .00 | .000 | 2. | * |
| 155. | .00 | .000 | 9. | * | 325. | .00 | .000 | 2. | * |
| 160. | .00 | .000 | 8. | * | 330. | .00 | .000 | 2. | * |
| 165. | .00 | .000 | 8. | * | 335. | .00 | .000 | 2. | * |

TOTAL PRECIP. = 1.64 (1-HOUR RAIN = 1.42) EXECESS PRECIP. = .293 INCHES
VOLUME OF EXCESS PRECIP = 3. ACRE-FEET
PEAK Q = 18. CFS TIME OF PEAK = 65. MIN.
INFILT.= 3.00 IN/HR DECAY = .00180 FNINF = .50 IN/HR
MAX.PERV.RET.= .40 IN. MAX.IMP.RET.= .10 IN.

1 U.D.F.C.D. CUHPD RUNOFF ANALYSIS EXECUTED ON DATE AT TIME

CUHPE/PC VERSION MODIFIED IN JANUARY 1985 TO WRITE OUTPUT FILE OF STORM HYDROGRAPHS FOR SUBSEQUENT USE WITH MULTI-PLAN RIVER ROUTING ROUTINES OF HEC-1

FT. LUPTON OFFSITE BASIN O-1 - Historic Conditions - 8/28/96

NO HYDROGRAPH VALUES WERE WRITTEN TO AN OUTPUTFILE FOR THIS RUN OF CUHPD.

CUHP

19

FT. LUPTON OFFSITE BASIN O-1 - Historic Conditions - 8/28/96

HFTO11ØØ.CHI

100-YEAR 100 2.71 0.000.000.000.00

0 1 15.0 1BASIN O-1*

2151.8900.910 2.000.015 0.00 0.400.1003.000.00180.5000 0

E

U.D.F.C.D. CUHP RUNOFF ANALYSIS EXECUTED ON DATE AT TIME HFT0110Ø.CHO

CUHPE/PC VERSION MODIFIED IN JANUARY 1985

PRINT OPTION NUMBER SELECTED FOR THIS BASIN IS 7

FT. LUPTON OFFSITE BASIN O-1 - Historic Conditions - 8/28/96

BASIN ID: -- BASIN COMMENT: BASIN O-1*

| AREA OF BASIN (SQMI) | LENGTH OF BASIN (MI) | DIST TO CENTROID (MI) | IMPERVIOUS AREA (PCT) | SLOPE (FT/FT) | UNIT DURATION (MIN) |
|---|---|---|---|---|---|
| .22 | 1.89 | .91 | 2.00 | .0150 | 5.00 |

| COEFFICIENT (REFLECTING TIME TO PEAK) | COEFFICIENT (RELATED TO PEAK RATE OF RUNOFF) |
|---|---|
| .156 | .265 |

CALCULATED UNIT HYDROGRAPH

| TIME TO PEAK (MIN) | PEAK RATE OF RUNOFF (CFS/SQMI) | UNIT HYDROGRAP PEAK (CFS) | VOLUME OF RUNOFF (AF) |
|---|---|---|---|
| 35.68 | 306.80 | 65.96 | 11.47 |

WIDTH AT 50 = 98. MIN. WIDTH AT 75 = 51. MIN. K50 = .22 K75 = .30

RAINFALL LOSSES INPUT W/ BASIN DATA

MAX. PERVIOUS RET. = .40 IN. MAX. IMPERVIOUS RET. = .10 IN.
INFILTRATION = 3.00 IN./HR. DECAY = .00180/SECOND FNINFL = .50 IN./HR.

| TIME | UNIT HYDROGRAPH | | TIME | UNIT HYDROGRAPH | | TIME | UNIT HYDROGRAPH | |
|---|---|---|---|---|---|---|---|---|
| 0. | 0. | * | 110. | 34. | * | 220. | 15. | * |
| 5. | 7. | * | 115. | 32. | * | 225. | 14. | * |
| 10. | 20. | * | 120. | 31. | * | 230. | 14. | * |
| 15. | 35. | * | 125. | 30. | * | 235. | 13. | * |
| 20. | 48. | * | 130. | 29. | * | 240. | 13. | * |
| 25. | 58. | * | 135. | 28. | * | 245. | 12. | * |
| 30. | 64. | * | 140. | 27. | * | 250. | 12. | * |
| 35. | 66. | * | 145. | 26. | * | 255. | 11. | * |
| 40. | 65. | * | 150. | 25. | * | 260. | 11. | * |
| 45. | 62. | * | 155. | 24. | * | 265. | 10. | * |
| 50. | 58. | * | 160. | 23. | * | 270. | 10. | * |
| 55. | 54. | * | 165. | 22. | * | 275. | 10. | * |
| 60. | 50. | * | 170. | 21. | * | 280. | 9. | * |
| 65. | 48. | * | 175. | 21. | * | 285. | 9. | * |
| 70. | 49. | * | 180. | 20. | * | 290. | 9. | * |
| 75. | 48. | * | 185. | 19. | * | 295. | 8. | * |
| 80. | 46. | * | 190. | 18. | * | 300. | 8. | * |
| 85. | 44. | * | 195. | 18. | * | 305. | 8. | * |
| 90. | 42. | * | 200. | 17. | * | 310. | 7. | * |
| 95. | 40. | * | 205. | 16. | * | 315. | 0. | * |

```
100.        38.    *   210.        16.    *     0.        0.    *
105.        36.    *   215.        15.    *     0.        0.    *
1       BASIN ID:          --  BASIN COMMENT:  BASIN O-1*
```

**** STORM NO. = 1 **** DATE OR RETURN PERIOD = 100-YEAR

| TIME (MIN.) | INCREMENT RAINFALL (IN) | TOTAL EXCESS PRECIP | STORM HYDROGRAPH (CFS) | TIME (MIN.) | INCREMENT RAINFALL (IN) | TOTAL EXCESS PRECIP | STORM HYDROGRAPH (CFS) |
|---|---|---|---|---|---|---|---|
| 0. | .00 | .000 | 0. | 180. | .00 | .000 | 43. |
| 5. | .03 | .000 | 0. | 185. | .00 | .000 | 41. |
| 10. | .08 | .000 | 0. | 190. | .00 | .000 | 40. |
| 15. | .12 | .002 | 0. | 195. | .00 | .000 | 38. |
| 20. | .22 | .004 | 0. | 200. | .00 | .000 | 37. |
| 25. | .38 | .097 | 1. | 205. | .00 | .000 | 36. |
| 30. | .68 | .626 | 6. | 210. | .00 | .000 | 34. |
| 35. | .38 | .332 | 18. | 215. | .00 | .000 | 33. |
| 40. | .22 | .172 | 35. | 220. | .00 | .000 | 32. |
| 45. | .17 | .125 | 52. | 225. | .00 | .000 | 31. |
| 50. | .14 | .093 | 68. | 230. | .00 | .000 | 30. |
| 55. | .11 | .067 | 81. | 235. | .00 | .000 | 28. |
| 60. | .11 | .067 | 90. | 240. | .00 | .000 | 27. |
| 65. | .11 | .067 | 96. | 245. | .00 | .000 | 26. |
| 70. | .05 | .013 | 98. | 250. | .00 | .000 | 25. |
| 75. | .05 | .013 | 98. | 255. | .00 | .000 | 24. |
| 80. | .03 | .001 | 96. | 260. | .00 | .000 | 24. |
| 85. | .03 | .001 | 92. | 265. | .00 | .000 | 23. |
| 90. | .03 | .001 | 89. | 270. | .00 | .000 | 22. |
| 95. | .03 | .001 | 87. | 275. | .00 | .000 | 21. |
| 100. | .03 | .001 | 85. | 280. | .00 | .000 | 20. |
| 105. | .03 | .001 | 82. | 285. | .00 | .000 | 20. |
| 110. | .03 | .001 | 79. | 290. | .00 | .000 | 19. |
| 115. | .03 | .001 | 75. | 295. | .00 | .000 | 18. |
| 120. | .03 | .001 | 72. | 300. | .00 | .000 | 17. |
| 125. | .00 | .000 | 69. | 305. | .00 | .000 | 17. |
| 130. | .00 | .000 | 66. | 310. | .00 | .000 | 16. |
| 135. | .00 | .000 | 63. | 315. | .00 | .000 | 16. |
| 140. | .00 | .000 | 60. | 320. | .00 | .000 | 15. |
| 145. | .00 | .000 | 57. | 325. | .00 | .000 | 14. |
| 150. | .00 | .000 | 55. | 330. | .00 | .000 | 14. |
| 155. | .00 | .000 | 52. | 335. | .00 | .000 | 13. |
| 160. | .00 | .000 | 50. | 340. | .00 | .000 | 8. |
| 165. | .00 | .000 | 48. | 345. | .00 | .000 | 5. |
| 170. | .00 | .000 | 46. | 350. | .00 | .000 | 4. |
| 175. | .00 | .000 | 45. | 355. | .00 | .000 | 3. |

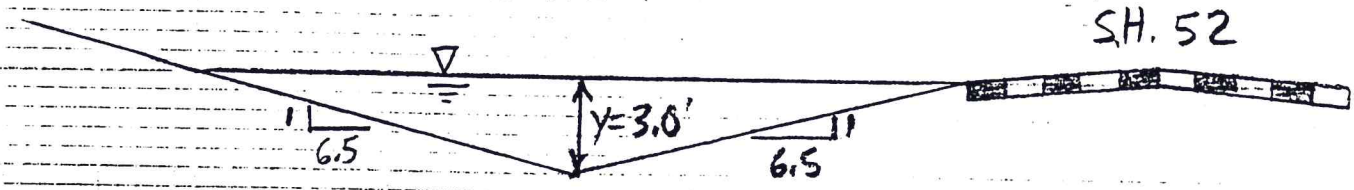
TOTAL PRECIP. = 3.13 (1-HOUR RAIN = 2.71) EXECESS PRECIP. = 1.685 INCHES
VOLUME OF EXCESS PRECIP = 19. ACRE-FEET
PEAK Q = 98. CFS TIME OF PEAK = 70. MIN.
INFILT.= 3.00 IN/HR DECAY = .00180 FNINF = .50 IN/HR
MAX.PERV.RET.= .40 IN. MAX.IMP.RET.= .10 IN.
U.D.F.C.D. CUHPD RUNOFF ANALYSIS EXECUTED ON DATE AT TIME

CUHPE/PC VERSION MODIFIED IN JANUARY 1985 TO WRITE OUTPUT FILE OF STORM HYDROGRAPHS FOR SUBSEQUENT USE WITH MULTI-PLAN RIVER ROUTING ROUTINES OF HEC-1

FT. LUPTON OFFSITE BASIN O-1 - Historic Conditions - 8/28/96

# Existing Ditch Capacity Along S.H. 52

Basin O-1 $Q_{100}$ = 98 cfs from CUHP




n = 0.035 (grass)

s = 0.1%

Y = 3.0'

$Q_{max}$ = 102 cfs > 98 cfs - O.K.

24

# DRAINAGE CALCULATIONS

| | | | | | | |
|---|---|---|---|---|---|---|
| | | **Merrick and Company** | | | | |
| | | Intensity Duration Frequency Calculations | | | | |
| | | Ft. Lupton Master Drainage Study | | | Job No. | 18012519 |
| | | | | | | |
| | | Calculated By: | | Mark Ericson | | |
| | | | | | | |
| | | | | | | |
| | | 2-YEAR | 5-YEAR | 10-YEAR | 50-YEAR | 100-YEAR |
| One-Hour Point Rainfall (In.) | | 1.00 | 1.42 | 1.68 | 2.35 | 2.71 |
| | | | | | | |
| | 5 Min. In./Hr. | 3.48 | 4.94 | 5.85 | 8.18 | 9.43 |
| | 10 Min. In./Hr. | 2.70 | 3.83 | 4.54 | 6.35 | 7.32 |
| | 15 Min. In./Hr. | 2.28 | 3.24 | 3.83 | 5.36 | 6.18 |
| | 30 Min. In./Hr. | 1.58 | 2.24 | 2.65 | 3.71 | 4.28 |
| | 60 Min. In./Hr. | 1.00 | 1.42 | 1.68 | 2.35 | 2.71 |

**Merrick and Company**

Time of Concentration

Ft. Lupton Master Drainage Study

Job No. 18012519

Calculated By: Mark Ericson Date: 8/30/96

Tc=Ti+Tt

Tc Check (Urbanized Basins)

| Sub-Basin Data | | | Initial/Overland Time (ti) | | | Travel: Time (tt) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Desig: | Area Acres | C5 | Length Feet | Slope % | Ti Min | Length Feet | Slope % | Vel. FPS | Tt Min | Comp. Tc | Total Length. Feet | Tc= (L/180)+10 Min | Fina Tc | Remarks |
| A1 | 4.63 | 0.45 | 200 | 3.3 | 11.2 | 600 | 1.8 | 2.7 | 3.7 | 14.9 | 800 | N/A | 15 | |
| A2 | 5.33 | 0.45 | 150 | 3.3 | 9.7 | 1,000 | 1.7 | 2.6 | 6.4 | 16.1 | 1,150 | 16.4 | 16 | |
| A3 | 6.38 | 0.45 | 200 | 2.0 | 13.2 | 1,180 | 1.4 | 2.3 | 8.6 | 21.7 | 1,380 | 17.7 | 18 | |
| A4 | 4.32 | 0.45 | 200 | 2.0 | 13.2 | 450 | 1.6 | 2.5 | 3.0 | 16.2 | 650 | 13.6 | 14 | |
| B1 | 6.61 | 0.45 | 200 | 2.0 | 13.2 | 1,030 | 1.1 | 2.1 | 8.2 | 21.3 | 1,230 | 16.8 | 17 | |
| B2 | 3.72 | 0.45 | 200 | 2.0 | 13.2 | 1,230 | 1.6 | 2.5 | 8.2 | 21.4 | 1,430 | 17.9 | 18 | |
| C1 | 7.67 | 0.45 | 200 | 2.0 | 13.2 | 1,900 | 1.2 | 2.2 | 14.4 | 27.6 | 2,100 | 21.7 | 22 | |
| C2 | 5.79 | 0.45 | 200 | 2.0 | 13.2 | 230 | 2.0 | 2.9 | 1.3 | 14.5 | 430 | 12.4 | 12 | |
| D1 | 3.63 | 0.45 | 140 | 2.0 | 11.0 | 680 | 1.5 | 2.4 | 4.7 | 15.7 | 820 | 14.6 | 15 | |
| D2 | 4.68 | 0.45 | 200 | 2.0 | 13.2 | 550 | 1.3 | 2.2 | 4.2 | 17.3 | 750 | 14.2 | 14 | |
| D3 | 6.01 | 0.45 | 200 | 2.0 | 13.2 | 1,150 | 1.2 | 2.2 | 8.7 | 21.9 | 1,350 | 17.5 | 18 | |
| E1 | 5.05 | 0.45 | 140 | 2.0 | 11.0 | 480 | 1.3 | 2.2 | 3.6 | 14.6 | 620 | 13.4 | 13 | |
| E2 | 1.84 | 0.45 | 200 | 2.0 | 13.2 | 200 | 1.3 | 2.2 | 1.5 | 14.7 | 400 | 12.2 | 12 | |
| F1 | 5.05 | 0.45 | 200 | 2.0 | 13.2 | 250 | 2.0 | 2.9 | 1.4 | 14.6 | 450 | 12.5 | 13 | |
| F2 | 2.02 | 0.45 | 200 | 2.0 | 13.2 | 200 | 1.5 | 2.4 | 1.4 | 14.6 | 400 | 12.2 | 12 | |
| F3 | 1.52 | 0.45 | 200 | 2.0 | 13.2 | 80 | 1.3 | 2.2 | 0.6 | 13.8 | 280 | 11.6 | 12 | |
| G1 | 8.72 | 0.45 | 200 | 2.0 | 13.2 | 1,650 | 1.8 | 2.7 | 10.2 | 23.3 | 1,850 | 20.3 | 20 | |
| G2 | 7.85 | 0.45 | 200 | 2.0 | 13.2 | 900 | 1.7 | 2.6 | 5.8 | 18.9 | 1,100 | 16.1 | 16 | |
| G3 | 2.53 | 0.45 | 200 | 2.5 | 12.2 | 250 | 2.0 | 2.9 | 1.4 | 13.7 | 450 | 12.5 | 13 | |
| H1 | 2.80 | 0.45 | 200 | 2.5 | 12.2 | 1,000 | 1.9 | 2.8 | 6.0 | 18.2 | 1,200 | 16.7 | 17 | |
| H2 | 6.24 | 0.45 | 200 | 2.0 | 13.2 | 2,100 | 1.8 | 2.7 | 13.0 | 26.1 | 2,300 | 22.8 | 23 | |
| I1 | 3.76 | 0.65 | 40 | 2.0 | 4.1 | 470 | 2.3 | 3.0 | 2.6 | 6.7 | 510 | 12.8 | 7 | |
| I2 | 5.88 | 0.65 | 200 | 3.5 | 7.6 | 650 | 2.3 | 3.0 | 3.6 | 11.2 | 850 | 14.7 | 11 | |
| I3 | 3.61 | 0.65 | 60 | 2.0 | 5.0 | 850 | 0.7 | 1.7 | 8.3 | 13.3 | 910 | 15.1 | 13 | |

**Merrick and Company**

Storm Drainage System Design

Ft. Lupton Master Drainage Study

Job No. 18012519

5-Year Storm

Calculated By: Mark Ericson

Date: 8/30/96

| Street | D.P. | Direct Runoff | | | | | | | Total Runoff | | | | Street | | Pipe | | | Travel Time | | | Type R Inlet Size |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Area Des. | Area (Ac) | Run. Coef. | Tc Min | C*A (Ac) | I In/Hr | Q CFS | Tc Sum Min | C*A | I In/Hr | Q CFS | Slop % | Flow CFS | Flow CFS | Slop % | Pipe Size | L Ft | Vel FPS | Tt Min | |
| | 1 | A1 | 4.63 | 0.45 | 15 | 2.08 | 3.24 | 6.75 | | | | | | | | | | | | | Size for Q100 |
| | 2 | A2 | 5.33 | 0.45 | 16 | 2.40 | 3.19 | 7.65 | 16 | 4.48 | 3.19 | 14.30 | | | | | | | | | Size for Q100 |
| | 3 | A3 | 6.38 | 0.45 | 18 | 2.87 | 2.99 | 8.58 | 28 | 7.35 | 2.33 | 17.13 | | | | | | 1400 | 2 | 12 | 15' |
| | 4 | A4 | 4.32 | 0.45 | 14 | 1.94 | 3.36 | 6.53 | 29 | 9.30 | 2.29 | 21.29 | | | | | | 600 | 8 | 1 | 10' |
| | 5 | B1 | 6.61 | 0.45 | 17 | 2.97 | 3.09 | 9.19 | | | | | | | | | | | | | 15' |
| | 6 | B2 | 3.72 | 0.45 | 18 | 1.67 | 2.99 | 5.01 | 18 | 4.65 | 2.99 | 13.90 | | | | | | 400 | 8 | 1 | 10' |
| | 7 | C1 | 7.67 | 0.45 | 22 | 3.45 | 2.70 | 9.32 | 31 | 17.40 | 2.21 | 38.45 | | | | | | 750 | 8 | 2 | 15' |
| | 8 | C2 | 5.79 | 0.45 | 12 | 2.61 | 3.60 | 9.38 | 34 | 20.00 | 2.08 | 41.61 | | | | | | 1500 | 8 | 3 | 15' |
| | 9 | D1 | 3.63 | 0.45 | 15 | 1.63 | 3.24 | 5.29 | | | | | | | | | | | | | Size for Q100 |
| | 10 | D2 | 4.68 | 0.45 | 14 | 2.11 | 3.36 | 7.08 | 15 | 3.74 | 3.24 | 12.12 | | | | | | 300 | 8 | 1 | Size for Q100 |
| | 11 | D3 | 6.01 | 0.45 | 18 | 2.70 | 2.99 | 8.09 | 18 | 6.44 | 2.99 | 19.27 | | | | | | 300 | 8 | 1 | Size for Q100 |
| | 12 | E1 | 5.05 | 0.45 | 13 | 2.27 | 3.48 | 7.91 | | | | | | | | | | | | | Size for Q100 |
| | 13 | E2 | 1.84 | 0.45 | 12 | 0.83 | 3.60 | 2.98 | 13 | 3.10 | 3.48 | 10.79 | | | | | | | | | Size for Q100 |
| | 14 | F1 | 5.05 | 0.45 | 13 | 2.27 | 3.48 | 7.91 | 23 | 11.82 | 2.62 | 30.96 | | | | | | 2200 | 8 | 5 | 10' |
| | 15 | F2 | 2.02 | 0.45 | 12 | 0.91 | 3.60 | 3.27 | 24 | 12.73 | 2.56 | 32.58 | | | | | | 300 | 8 | 1 | 5' |
| | 16 | F3 | 1.52 | 0.45 | 12 | 0.68 | 3.60 | 2.46 | 24 | 13.41 | 2.56 | 34.33 | | | | | | 150 | 8 | 0 | 5' |
| | 17 | G1 | 8.72 | 0.45 | 20 | 3.92 | 2.83 | 11.10 | 36 | 37.34 | 1.99 | 74.30 | | | | | | 900 | 8 | 2 | 15' |
| | 18 | G2 | 7.85 | 0.45 | 16 | 3.53 | 3.17 | 11.20 | 37 | 40.87 | 1.95 | 79.69 | | | | | | 350 | 8 | 1 | 15' |
| | 19 | G3 | 2.53 | 0.45 | 13 | 1.14 | 3.48 | 3.96 | 38 | 42.01 | 1.91 | 80.23 | | | | | | 250 | 8 | 1 | 5' |
| | 20 | H1 | 2.80 | 0.45 | 17 | 1.26 | 3.09 | 3.89 | 39 | 43.27 | 1.87 | 80.91 | | | | | | 450 | 8 | 1 | 5' |
| | 21 | H2 | 6.24 | 0.45 | 23 | 2.81 | 2.62 | 7.36 | 39 | 46.08 | 1.87 | 86.16 | | | | | | | | | 10' |
| | 22 | I1 | 3.76 | 0.65 | 7 | 2.44 | 4.43 | 10.83 | | | | | | | | | | | | | 15' |
| | 23 | I2 | 5.88 | 0.65 | 11 | 3.82 | 3.72 | 14.22 | 11 | 6.27 | 3.72 | 23.31 | | | | | | 250 | 8 | 1 | 15' |
| | 24 | I3 | 3.61 | 0.65 | 15 | 2.35 | 3.24 | 7.60 | | | | | | | | | | | | | Discharge to Ditch |

**Merrick and Company**

Storm Drainage System Design

Ft. Lupton Master Drainage Study

Job No. 18012519

100-Year Storm

Calculated By: Mark Ericson

Date: 8/30/96

| Street | D.P. | Direct Runoff | | | | | | | Total Runoff | | | | Street | | Pipe | | | Travel Time | | | Type R Inlet Size |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Area Des. | Area (Ac) | Run. Coef. | Tc Min | C*A (Ac) | I In/Hr | Q CFS | Tc Sum Min | C*A | I In/Hr | Q CFS | Slo % | Flow CFS | Flow CFS | Slop % | Pipe Size | L Ft | Vel FPS | Tt Min | |
| | 1 | A1 | 4.63 | 0.60 | 15 | 2.78 | 6.18 | 17.17 | | | | | | | | | | | | | 10' |
| | 2 | A2 | 5.33 | 0.60 | 16 | 3.20 | 5.98 | 19.12 | 16 | 5.98 | 5.98 | 35.74 | | | | | | | | | 10' |
| | 3 | A3 | 6.38 | 0.60 | 18 | 3.83 | 5.64 | 21.59 | 28 | 9.80 | 4.44 | 43.53 | | | | | | 1400 | 2 | 12 | Size for Q5 |
| | 4 | A4 | 4.32 | 0.60 | 14 | 2.59 | 6.36 | 16.49 | 29 | 12.40 | 4.37 | 54.17 | | | | | | 600 | 8 | 1 | Size for Q5 |
| | 5 | B1 | 6.61 | 0.60 | 17 | 3.97 | 5.82 | 23.08 | | | | | | | | | | | | | Size for Q5 |
| | 6 | B2 | 3.72 | 0.60 | 18 | 2.23 | 5.64 | 12.59 | 18 | 6.20 | 5.64 | 34.96 | | | | | | 400 | 8 | 1 | Size for Q5 |
| | 7 | C1 | 7.67 | 0.60 | 22 | 4.60 | 5.07 | 23.33 | 31 | 23.20 | 4.21 | 97.66 | | | | | | 750 | 8 | 2 | Size for Q5 |
| | 8 | C2 | 5.79 | 0.60 | 12 | 3.47 | 6.83 | 23.73 | 34 | 26.67 | 3.97 | 105.88 | | | | | | 1500 | 8 | 3 | Size for Q5 |
| | 9 | D1 | 3.63 | 0.60 | 15 | 2.18 | 6.18 | 13.46 | | | | | | | | | | | | | 10' |
| | 10 | D2 | 4.68 | 0.60 | 14 | 2.81 | 6.36 | 17.86 | 15 | 4.99 | 6.18 | 30.81 | | | | | | 300 | 8 | 1 | 10' |
| | 11 | D3 | 6.01 | 0.60 | 18 | 3.61 | 5.64 | 20.34 | 18 | 8.59 | 5.64 | 48.46 | | | | | | 300 | 8 | 1 | 10' |
| | 12 | E1 | 5.05 | 0.60 | 13 | 3.03 | 6.58 | 19.94 | | | | | | | | | | | | | 10' |
| | 13 | E2 | 1.84 | 0.60 | 12 | 1.10 | 6.83 | 7.54 | 13 | 4.13 | 6.58 | 27.20 | | | | | | | | | 5' |
| | 14 | F1 | 5.05 | 0.60 | 13 | 3.03 | 6.58 | 19.94 | 23 | 15.76 | 4.96 | 78.15 | | | | | | 2200 | 8 | 5 | Size for Q5 |
| | 15 | F2 | 2.02 | 0.60 | 12 | 1.21 | 6.83 | 8.28 | 24 | 16.97 | 4.84 | 82.13 | | | | | | 300 | 8 | 1 | Size for Q5 |
| | 16 | F3 | 1.52 | 0.60 | 12 | 0.91 | 6.83 | 6.23 | 24 | 17.88 | 4.84 | 86.54 | | | | | | 150 | 8 | 0 | Size for Q5 |
| | 17 | G1 | 8.72 | 0.60 | 20 | 5.23 | 5.34 | 27.94 | 36 | 49.78 | 3.84 | 191.16 | | | | | | 900 | 8 | 2 | Size for Q5 |
| | 18 | G2 | 7.85 | 0.60 | 16 | 4.71 | 5.98 | 28.17 | 37 | 54.49 | 3.77 | 205.43 | | | | | | 350 | 8 | 1 | Size for Q5 |
| | 19 | G3 | 2.53 | 0.60 | 13 | 1.52 | 6.58 | 9.99 | 38 | 56.01 | 3.70 | 207.24 | | | | | | 250 | 8 | 1 | Size for Q5 |
| | 20 | H1 | 2.80 | 0.60 | 17 | 1.68 | 5.82 | 9.78 | 39 | 57.69 | 3.63 | 209.41 | | | | | | 450 | 8 | 1 | Size for Q5 |
| | 21 | H2 | 6.24 | 0.60 | 23 | 3.74 | 4.96 | 18.57 | 39 | 61.43 | 3.63 | 223.01 | | | | | | | | | Size for Q5 |
| | 22 | I1 | 3.76 | 0.80 | 7 | 3.01 | 8.35 | 25.12 | | | | | | | | | | | | | Size for Q5 |
| | 23 | I2 | 5.88 | 0.80 | 11 | 4.70 | 7.07 | 33.26 | 11 | 7.71 | 7.07 | 54.52 | | | | | | 250 | 8 | 1 | Size for Q5 |
| | 24 | I3 | 3.61 | 0.80 | 15 | 2.89 | 6.18 | 17.85 | | | | | | | | | | | | | Discharge to Ditch |

**Merrick and Company**

Storm Drainage System Design

Ft. Lupton Master Drainage Study

SUMMARY RUNOFF TABLE

| DESIGN POINT | TRIBUTARY BASIN | CONTRI AREA (ACRES) | RUNOFF 5-YEAR STORM (CFS | PEAK 100-YEAR STORM (CFS) |
|---|---|---|---|---|
| 1 | A1 | 4.63 | 6.75 | 17.17 |
| 2 | A1-A2 | 9.96 | 14.30 | 35.74 |
| 3 | A1-A3 | 16.34 | 17.13 | 43.53 |
| 4 | A1-A4 | 20.66 | 21.29 | 54.17 |
| 5 | B1 | 6.61 | 9.19 | 23.08 |
| 6 | B1-B2 | 10.33 | 13.90 | 34.96 |
| 7 | A1-C1 | 38.66 | 38.45 | 97.66 |
| 8 | A1-C2 | 44.45 | 41.61 | 105.88 |
| 9 | D1 | 3.63 | 5.29 | 13.46 |
| 10 | D1-D2 | 8.31 | 12.12 | 30.81 |
| 11 | D1-D3 | 14.32 | 19.27 | 48.46 |
| 12 | E1 | 5.05 | 7.91 | 19.94 |
| 13 | E1-E2 | 6.89 | 10.79 | 27.20 |
| 14 | D1-F1 | 26.26 | 30.96 | 78.15 |
| 15 | D1-F2 | 28.28 | 32.58 | 82.13 |
| 16 | D1-F3 | 29.80 | 34.33 | 86.54 |
| 17 | A1-G1 | 82.97 | 74.30 | 191.16 |
| 18 | A1-G2 | 90.82 | 76.69 | 205.43 |
| 19 | A1-G3 | 93.35 | 80.23 | 207.24 |
| 20 | A1-H1 | 96.15 | 80.91 | 209.41 |
| 21 | A1-H2 | 102.39 | 86.16 | 223.01 |
| 22 | I1 | 3.76 | 10.83 | 25.12 |
| 23 | I1-I2 | 9.64 | 23.31 | 54.52 |
| 24 | I3 | 3.61 | 7.60 | 17.85 |

**Merrick and Company**

Storm Drainage System Design

Ft. Lupton Master Drainage Study — Job No. 18012519

Calculated By: Mark Ericson

Date: 8/30/96

Storm Sewer Sizing

Based on 1% Slope

| D.P. | Q5 | Q100 | Basin Q in Pipe | C5*A | i5 | C100*A | i100 | Total Q in Pipe | Req'd. RCP Pipe Dia. (in.) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 6.75 | 17.17 | 17.17 | | | | | | 24" |
| 2 | 7.65 | 19.12 | 19.12 | | | | | | 24" |
| 2 to 3 | | | | | | 5.98 | 5.98 | 35.76 | 30" |
| 3 | 8.58 | 21.59 | 8.58 | | | | | | 18" |
| 3 to 4 | | | | 4.81 | 2.29 | 5.98 | 4.37 | 37.15 | 30" |
| 4 | 6.53 | 16.49 | 6.53 | | | | | | 18" |
| 4 to Junct. | | | | 9.45 | 2.29 | 5.98 | 4.37 | 47.77 | 36" |
| 5 | 9.19 | 23.08 | 9.19 | | | | | | 18" |
| 6 | 5.01 | 12.59 | 5.01 | | | | | | 18" |
| 6 to Junct. | | | | 4.64 | 2.99 | | | 13.87 | 21" |
| Junct. to 7 | | | | 9.45 | 2.21 | 5.98 | 4.21 | 46.06 | 36" |
| 7 | 9.32 | 23.33 | 9.32 | | | | | | 18" |
| 7 to 8 | | | | 12.90 | 2.21 | 5.98 | 4.21 | 53.68 | 36" |
| 8 | 0.09 | 12.05 | 9.41 | | | | | | 18" |
| 8 to Junct. | 9.38 | 23.73 | 9.38 | 15.51 | 2.08 | 5.98 | 3.97 | 56.00 | 36" |
| 9 | 5.29 | 13.46 | 13.46 | | | | | | 21" |
| 10 | 7.08 | 17.86 | 17.86 | | | | | | 24" |
| 10 to 11 | | | | 0.00 | 0.00 | 4.99 | 6.18 | 30.84 | 27" |
| 11 | 8.09 | 20.34 | 20.34 | | | | | | 24" |
| 11 to Junct. | | | | 0.00 | 0.00 | 8.59 | 5.64 | 48.45 | 36" |
| 12 | 7.91 | 19.94 | 19.94 | | | | | | 24" |
| 13 | 2.98 | 7.54 | 7.54 | | | | | | 18" |
| 13 to Junct. | | | | 3.10 | 3.48 | 0.00 | 0.00 | 10.79 | 21" |
| Junct. to 14 | | | | 3.10 | 3.48 | 8.59 | 4.96 | 53.39 | 36" |
| 14 | 7.91 | 19.94 | 7.91 | | | | | | 18" |
| 14 to 15 | | | | 5.37 | 2.62 | 8.59 | 4.96 | 56.68 | 36" |
| 15 | 3.27 | 8.28 | 3.27 | | | | | | 18" |
| 15 to 16 | | | | 6.28 | 2.56 | 8.59 | 4.84 | 57.65 | 36" |
| 16 | 2.46 | 6.23 | 2.46 | | | | | | 18" |
| 16 to Junct. | | | | 6.96 | 2.56 | 8.59 | 4.84 | 59.39 | 36" |
| Junct. to 17 | | | | 22.47 | 1.99 | 14.57 | 3.84 | 100.66 | 42" |
| 17 | 11.10 | 27.94 | 11.10 | | | | | | 21" |
| 17 to 18 | | | | 26.39 | 1.99 | 14.57 | 3.84 | 108.46 | 48" |
| 18 | 11.20 | 28.17 | 11.20 | | | | | | 21" |
| 18 to 19 | | | | 29.92 | 1.95 | 14.57 | 3.77 | 113.27 | 48" |
| 19 | 3.96 | 9.99 | 3.96 | | | | | | 18" |
| 19 to 20 | | | | 31.44 | 1.91 | 14.57 | 3.70 | 113.96 | 48" |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 20 | 3.89 | 9.78 | 3.89 | | | | | | 18" | |
| 20 to 21 | | | | 32.70 | 1.87 | 14.57 | 3.63 | 114.04 | 48" | |
| 21 | 7.36 | 18.57 | 7.36 | | | | | | 18" | |
| 21 to Outlet | | | | 35.51 | 1.87 | 14.57 | 3.63 | 119.29 | 48" | |
| 22 | 10.83 | 25.12 | 10.83 | | | | | | 21" | |
| 23 | 14.22 | 33.26 | 14.22 | | | | | | 18" | |
| 23 to Outlet | | | | 6.27 | 3.72 | | | 23.32 | 27" | |
| 24 | 7.60 | 17.85 | N/A | | | | | | | |

32

**Merrick and Company**

Detention Pond Calculations

Ft. Lupton Master Drainage Study | Job No. 18012519

For Information Only - No Onsite Detention Is Required

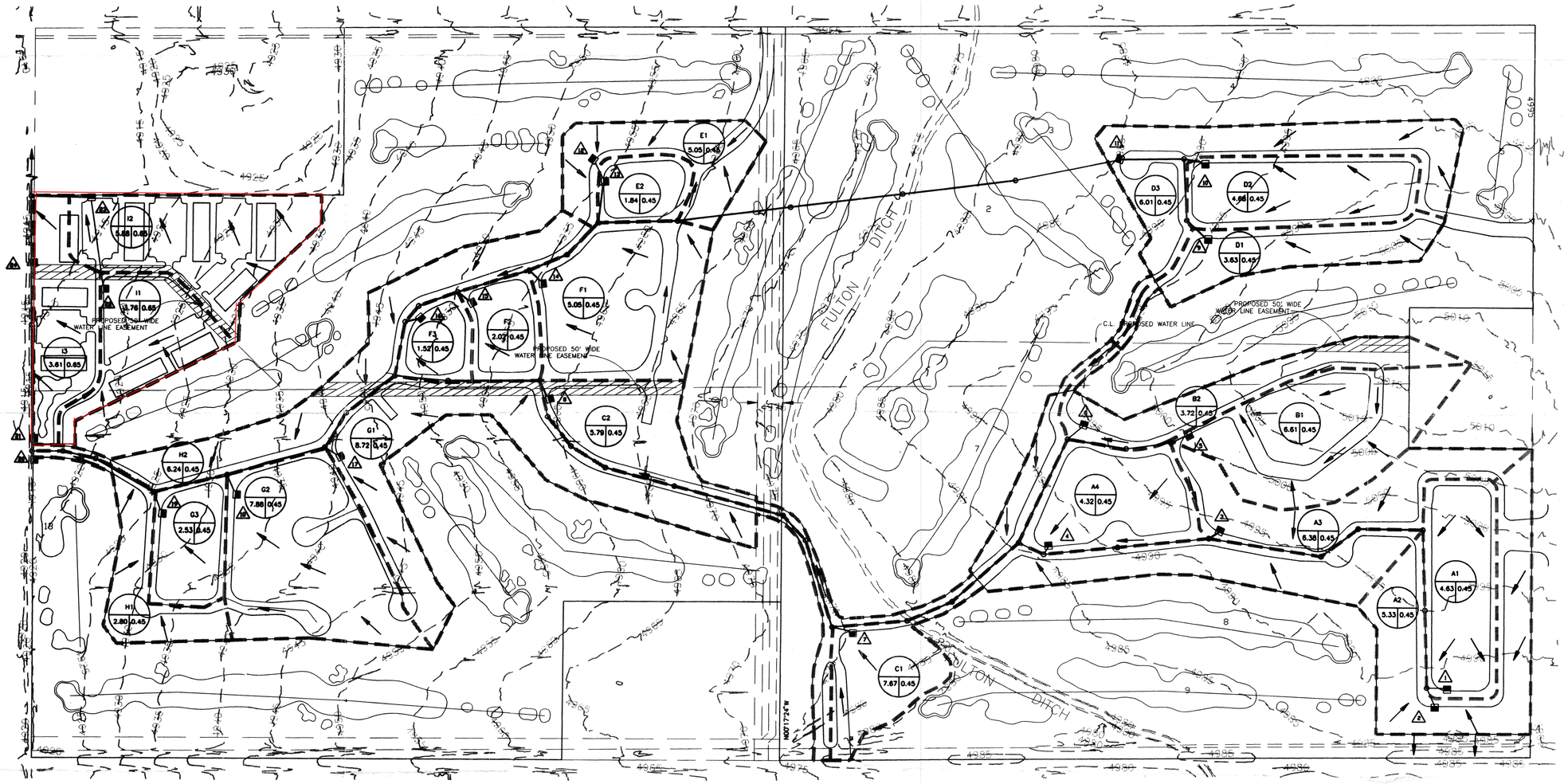
Calculated By: Mark Ericson

Formulas: K10 = (0.95I - 1.90)/100

K100 = (1.78I - 0.002I^2 - 3.56)/1000

V = KA

| Basin | Area (Acres) | Percent Imperv. (I) | K10 | K100 | V10 (Ac. Ft.) | V10 (CF) | V100 (Ac. Ft.) | V100 (CF) |
|---|---|---|---|---|---|---|---|---|
| A1 | 4.63 | 43 | 0.0390 | 0.0693 | 0.180 | 7856 | 0.321 | 13973 |
| A2 | 5.33 | 43 | 0.0390 | 0.0693 | 0.208 | 9043 | 0.369 | 16086 |
| A3 | 6.38 | 43 | 0.0390 | 0.0693 | 0.249 | 10825 | 0.442 | 19254 |
| A4 | 4.32 | 43 | 0.0390 | 0.0693 | 0.168 | 7330 | 0.299 | 13037 |
| B1 | 6.61 | 43 | 0.0390 | 0.0693 | 0.257 | 11215 | 0.458 | 19948 |
| B2 | 3.72 | 43 | 0.0390 | 0.0693 | 0.145 | 6312 | 0.258 | 11227 |
| C1 | 7.67 | 43 | 0.0390 | 0.0693 | 0.299 | 13013 | 0.531 | 23147 |
| C2 | 5.79 | 43 | 0.0390 | 0.0693 | 0.226 | 9824 | 0.401 | 17474 |
| D1 | 3.63 | 43 | 0.0390 | 0.0693 | 0.141 | 6159 | 0.251 | 10955 |
| D2 | 4.68 | 43 | 0.0390 | 0.0693 | 0.182 | 7940 | 0.324 | 14124 |
| D3 | 6.01 | 43 | 0.0390 | 0.0693 | 0.234 | 10197 | 0.416 | 18138 |
| E1 | 5.05 | 43 | 0.0390 | 0.0693 | 0.197 | 8568 | 0.350 | 15241 |
| E2 | 1.84 | 43 | 0.0390 | 0.0693 | 0.072 | 3122 | 0.127 | 5553 |
| F1 | 5.05 | 43 | 0.0390 | 0.0693 | 0.197 | 8568 | 0.350 | 15241 |
| F2 | 2.02 | 43 | 0.0390 | 0.0693 | 0.079 | 3427 | 0.140 | 6096 |
| F3 | 1.52 | 43 | 0.0390 | 0.0693 | 0.059 | 2579 | 0.105 | 4587 |
| G1 | 8.72 | 43 | 0.0390 | 0.0693 | 0.340 | 14795 | 0.604 | 26316 |
| G2 | 7.85 | 43 | 0.0390 | 0.0693 | 0.306 | 13319 | 0.544 | 23691 |
| G3 | 2.53 | 43 | 0.0390 | 0.0693 | 0.099 | 4293 | 0.175 | 7635 |
| H1 | 2.80 | 43 | 0.0390 | 0.0693 | 0.109 | 4751 | 0.194 | 8450 |
| H2 | 6.24 | 43 | 0.0390 | 0.0693 | 0.243 | 10587 | 0.432 | 18832 |
| I1 | 3.76 | 70 | 0.0646 | 0.1112 | 0.243 | 10581 | 0.418 | 18220 |
| I2 | 5.88 | 70 | 0.0646 | 0.1112 | 0.380 | 16546 | 0.654 | 28492 |
| I3 | 3.61 | 70 | 0.0646 | 0.1112 | 0.233 | 10158 | 0.402 | 17493 |
| TOTAL | 115.64 | | | | | 211006 | | 373210 |




## LEGEND

- 5000 — STAKING POINT
- EXISTING CONTOUR
- PROPOSED CONTOUR
- PLAYING AREA BOUNDARY
- STORM MANHOLE
- STORM SEWER
- STORM INLET
- DIRECTION OF FLOW
- DESIGN POINT
- DRAINAGE BASIN BOUNDARY
- H1 2.80 0.45 — BASIN DESIGNATION; AREA (acres); 5-YEAR RUNOFF COEFFICIENT

MAGNETIC

PROJECT NAME: FORT LUPTON GOLF COURSE
CLIENT NAME: CLIENT
REVISION NO.:REV
DRAWING DATE: 4/10/97
DRAWING NAME: MDR.DWG
PROJECT NO.: 18012689

DWGNAME: I:\ACL\18012689\DRAWINGS\MDR.DWG PLOT DATE: 04/10/97 PLOT TIME: 15:21:49

| REV | REVISION DESCRIPTION | DATE | CHANGED BY | CHECKED BY | APPROVED BY |
|---|---|---|---|---|---|


Engineers & Architects
MERRICK
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DENVER, COLORADO 80222
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| | REVIEW | | |
| | APPROVED | | |
| | CAD FILE NAME | | |

CLIENT PROJECT NO.: —

MERRICK PROJECT NO.: 18012689

SCALE: 1" = 200'

TITLE:

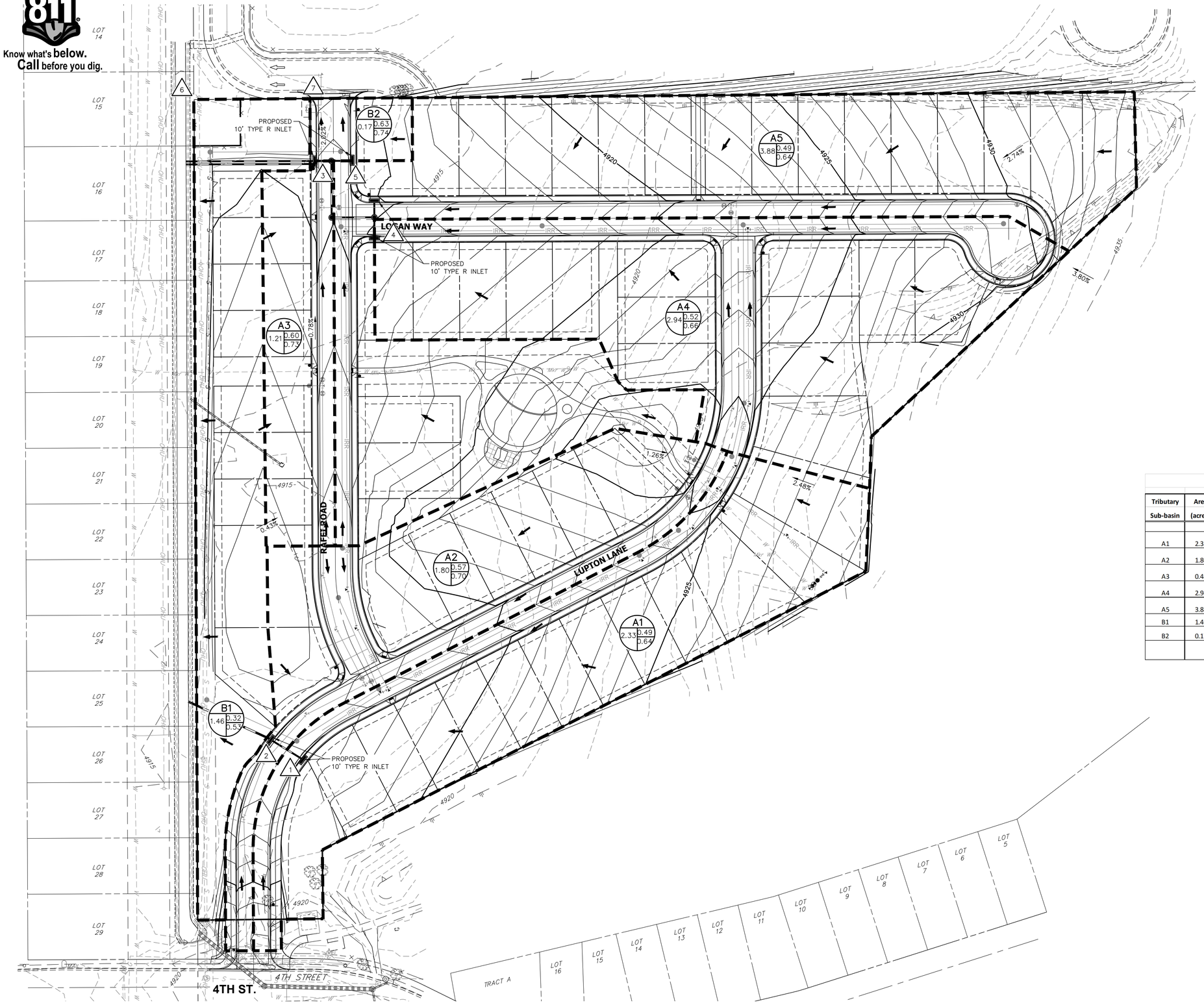
# FORT LUPTON MASTER DRAINAGE PLAN

| REVISION: | DRAWING NO.: | SHEET NO.: |
|---|---|---|
| A | MDR.DWG | 1 OF 1 |

# Appendix E
# Drainage Maps

# COYOTE CREEK FILING NO. 4

811 Know what's below. Call before you dig.




**BASIN SUMMARY TABLE**

| Tributary Sub-basin | Area (acres) | Percent Impervious | $C_5$ | $C_{100}$ | $t_c$ (min) | $Q_5$ (cfs) | $Q_{100}$ (cfs) |
|---|---|---|---|---|---|---|---|
| A1 | 2.33 | 52% | 0.49 | 0.64 | 13.0 | 3.9 | 9.8 |
| A2 | 1.80 | 62% | 0.57 | 0.70 | 11.4 | 3.8 | 8.8 |
| A3 | 0.48 | 64% | 0.60 | 0.73 | 9.7 | 1.1 | 2.6 |
| A4 | 2.94 | 56% | 0.52 | 0.66 | 11.1 | 5.7 | 13.8 |
| A5 | 3.88 | 51% | 0.49 | 0.64 | 13.7 | 6.4 | 16.1 |
| B1 | 1.46 | 29% | 0.32 | 0.53 | 13.8 | 1.6 | 5.0 |
| B2 | 0.17 | 69% | 0.63 | 0.74 | 5.0 | 0.5 | 1.2 |

50 25 0 50 100
ORIGINAL SCALE: 1" = 50'

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| No. | REVISION | BY | DATE |
|---|---|---|---|
| | | | |

| | |
|---|---|
| H-SCALE | 1"=50' |
| V-SCALE | 1"=X' |
| DATE | 12/13/21 |
| DESIGNED BY | AJH |
| DRAWN BY | XXX |
| CHECKED BY | |

COYOTE CREEK FILING NO. 4

FINAL DRAINAGE PLAN

SHEET 18 OF 27

JOB NO. 16093.00

# TRAFFIC IMPACT STUDY

**To:** **Roy Vestal** → Fort Lupton EST 1836

**From:** **Eli Farney, PE, PTOE**

**Date:** **November 12, 2021**

**Case No.** **Coyote Creek Filing No. 4**

# Coyote Creek Filing No. 4
# Single-Family Detached Housing Development

59 Units

North Side of 4th Street – 1 Mile East of US Route 85

Fort Lupton, CO

**November 2021**

**Prepared By:**

J·R ENGINEERING

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J·R ENGINEERING

# Table of Contents


1. Executive Summary……..……..4

2. Introduction ……..……5
   a. Vicinity Map
   b. Proposed Site Plan

3. Existing Conditions……7
   a. Existing Traffic Volumes
   b. 2021 Existing Traffic Volumes and Lane Geometry
   c. 2021 Existing Conditions Level of Service

4. Proposed Conditions……..10
   a. Traffic Growth Forecast
   b. Site Trip Generation
   c. Site Trip Distribution
   d. Site-Generated Traffic Volumes
   e. 2022 Opening Day Background Traffic Volumes
   f. 2040 Future Year Background Traffic Volumes
   g. 2022 Opening Day Traffic Volumes
   h. 2040 Future Year Traffic Volumes

5. Traffic Evaluation……..……17
   a. Analysis Methodology
   b. Peak Hour Definition
   c. 2022 Opening Day Intersection Level of Service
   d. 2040 Opening Day Intersection Level of Service

6. Improvements Analysis……..……..20
   a. Roadway & Intersection Modifications
   b. Traffic Signal Warrant Analysis

7. Conclusion……..……21

I. Appendices.....22
a. Appendix 1 – Existing Traffic Counts
b. Appendix 2 – Trip Generation Report
c. Appendix 3 – Synchro Reports

# List of Figures

Figure 1 – Vicinity Map.....5
Figure 2 – Proposed Site Plan & Study Intersection.....6
Figure 3 – Through Movement Tube Count Location.....7
Figure 4 – 2021 Existing Traffic Volumes and Lane Geometry.....8
Figure 6 – Site-Generated Peak HourTraffic Volumes.....11
Figure 7 – 2022 Opening Day Background Traffic Volumes.....13
Figure 8 – 2040 Future Year Background Traffic Volumes.....14
Figure 8 – 2022 Opening Day Total Traffic Volumes.....15
Figure 9 – 2040 Future Year Total Traffic Volumes.....16

# List of Tables

Table 1 – Traffic Impact Study Objectives.....4
Table 2 – Peak Hour Definition.....14
Table 3 – 2022 Intersection Level of Service.....15
Table 4 – 2022 Queue Lengths .....15

# 1 - Executive Summary

JR Engineering has prepared a comprehensive Traffic Impact Study (TIS) for the proposed Coyote Creek Filing Number 4 single-family attached housing development on the north side of 4th Street one mile east of US Route 85 in Fort Lupton, Colorado.

The contents of this TIS include the objectives stated in **Table 1**:

**Table 1 –** Traffic Impact Study Objectives

| Traffic Impact Study Objectives |
|---|
| 2021 Existing Traffic Operations |
| 2022 Opening Day Traffic Analysis |
| 2040 Future Year Traffic Analysis |

## Key Findings of this Traffic Impact Study:

| Description | Evaluation |
|---|---|
| Intersection Analysis<br>Existing Conditions | I1: 9th Street & School Access Road: All approaches Level of Service C or better<br>I2: 4th Street & Beth Avenue: All approaches Level of Service A |
| Intersection Analysis<br>2022 Opening Day | I1: 9th Street & School Access Road: All approaches Level of Service C or better<br>I2: 4th Street & Beth Avenue: All approaches Level of Service A<br>A1: 4th Street & Access/Logan: All approaches Level of Service A |
| Intersection Analysis<br>2040 Future Year | I1: 9th Street & School Access Road: All approaches Level of Service C or better<br>I2: 4th Street & Beth Avenue: All approaches Level of Service A<br>A1: 4th Street & Access/Logan: All approaches Level of Service A |
| Proposed Roadway Improvements<br>(Turn lanes, acceleration lanes, etc) | Due to low traffic volumes and high Levels of Service, no new turn lane improvements are expected to be required to support movements to and from the development. There is an existing two-way-left-turn lane on 9th Street that can be re-striped to provide a westbound left-turn lane to the access road to the site |

# 2 - Introduction

JR Engineering (JR) has completed a review of the existing and Opening Day traffic operations at the two study intersections that will serve the proposed development access points. **Figure 1** shows a vicinity map of the proposed site.

**Figure 1:** Proposed Coyote Creek Filing No. 4 Development - Vicinity Map

# Proposed Site Plan & Study Intersections

Figure 2 shows the proposed Site Plan & Study Intersection locations.

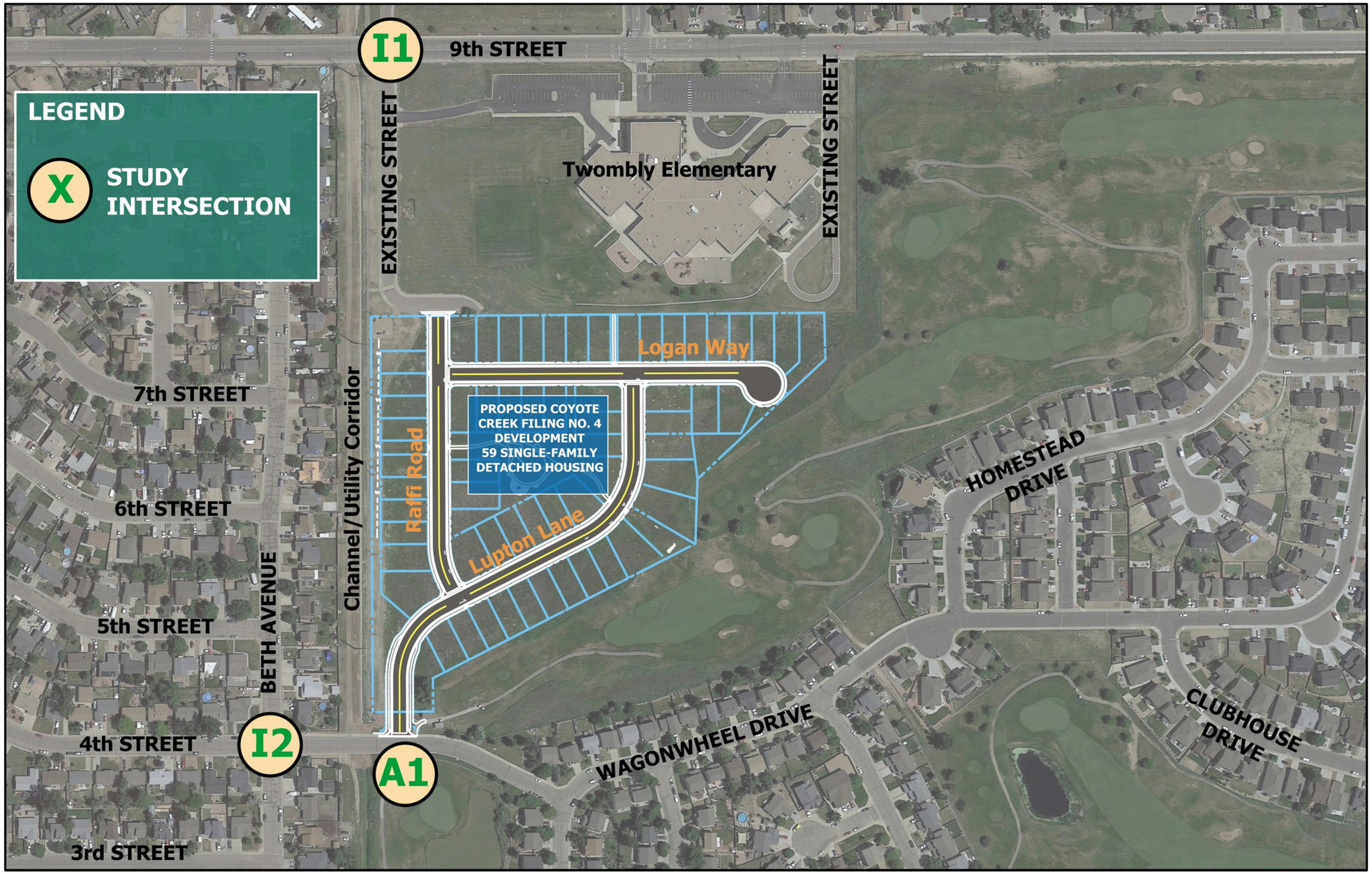



**Figure 2:** Site Plan and Study Intersection Location

# 3 – Existing Conditions

## Existing Traffic Volumes

Existing intersection turning movement traffic counts were gathered in the field by All Traffic Data at the two intersections shown in **Figure 3**. The existing turning movement traffic volumes are shown in **Figure 4**.

- **Intersection Turning Movement Counts** – 9th Street & Existing School Access Road
  - Collected on Tuesday, November 9, 2021 from 7:00 a.m. to 6:00 p.m.

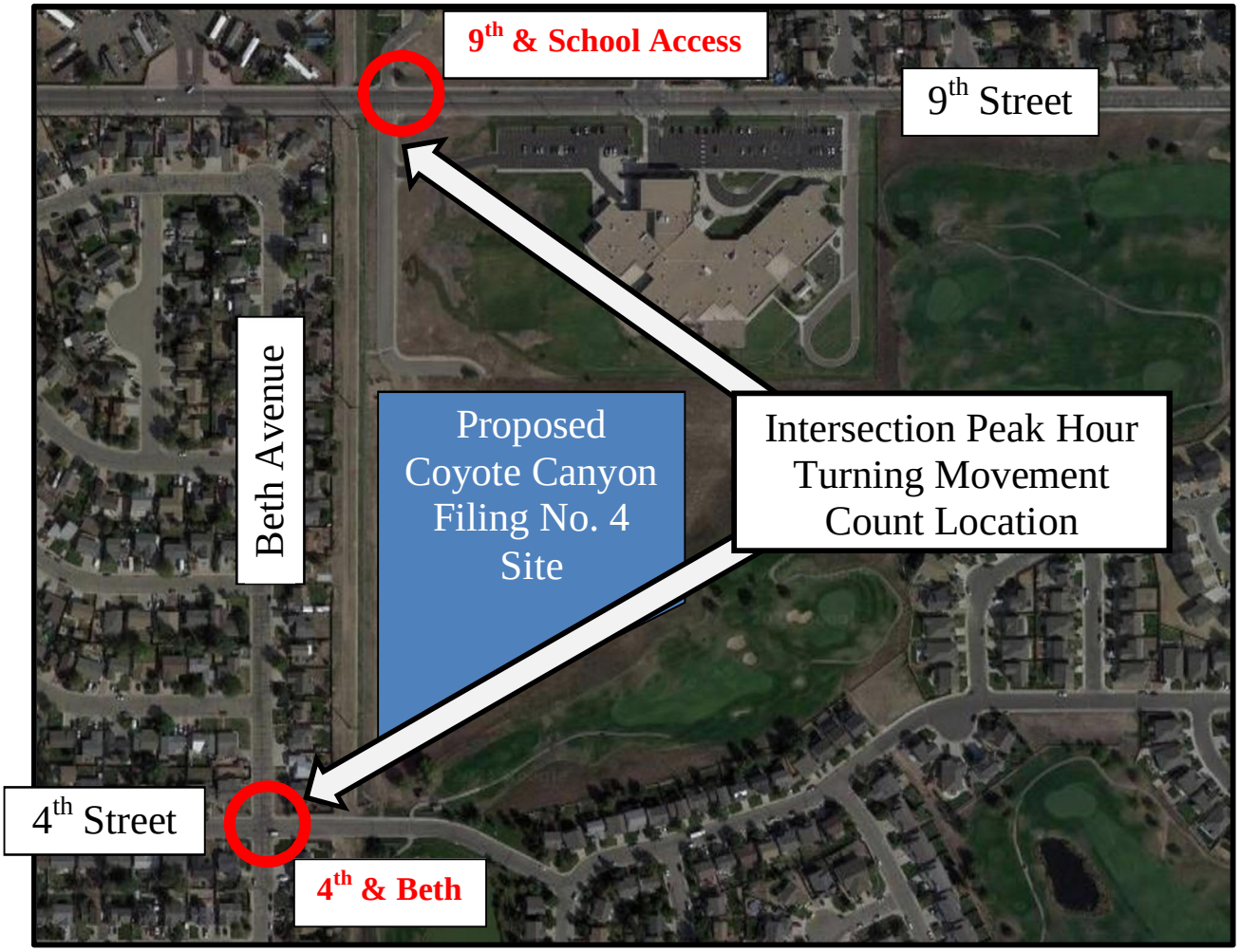



**Figure 3:** Peak Hour Intersection Turning Movement Count Locations

Traffic count data is available in **Appendix 2**

# 2021 Existing Traffic Volumes and Lane Geometry

Figure 4 shows the existing lane geometry and traffic volumes during the AM and PM peak hours.

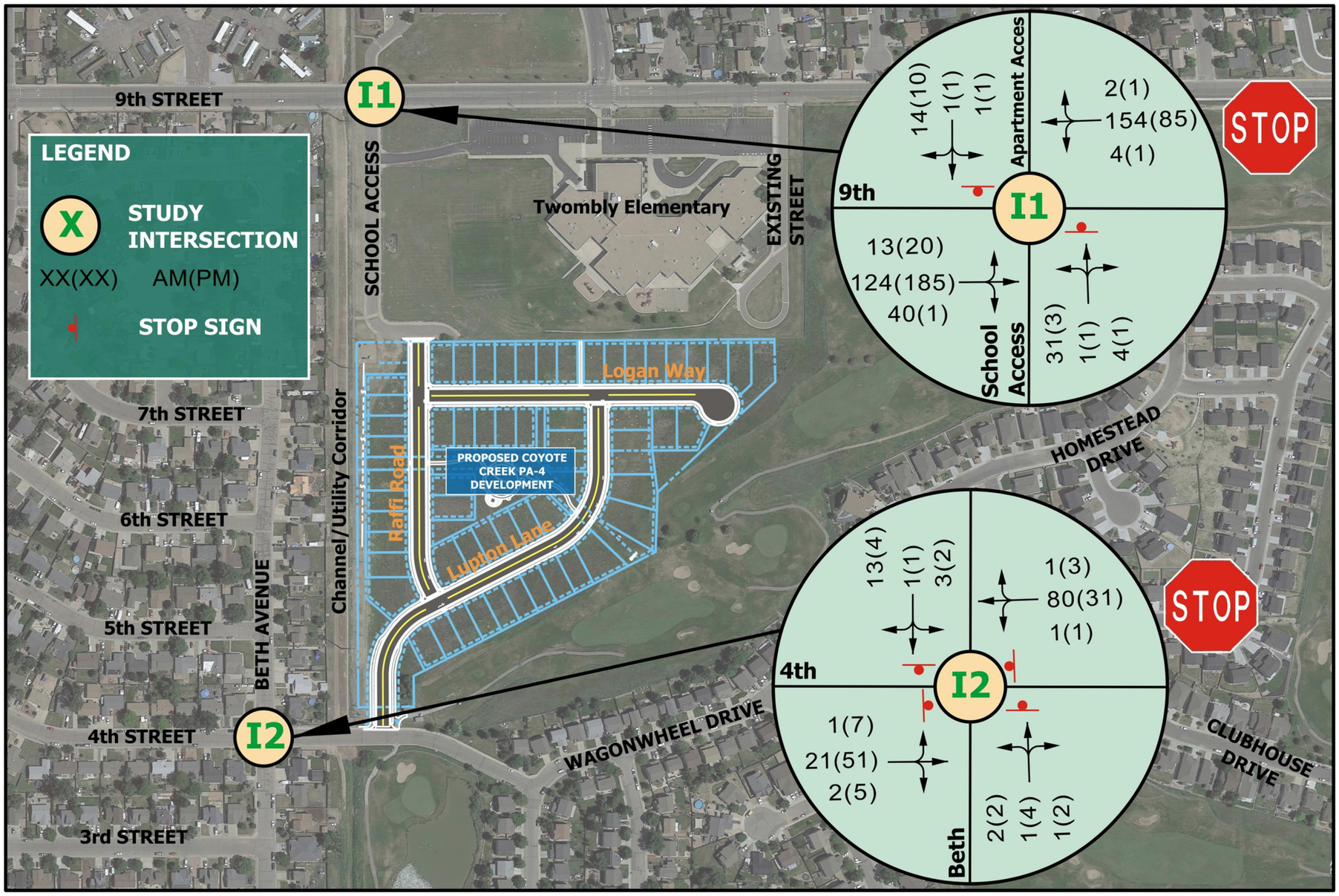



**Figure 4:** 2021 Existing Traffic Volumes

## Existing Conditions - Level of Service

The two existing intersections that will serve as the primary access points to Coyote Creek Filing Number 4 were analyzed using the intersection turning movement traffic counts taken in November 2021.

**Table 3 –** Stop Controlled Intersection Level of Service – **2021 Existing Conditions**

| Stop-Controlled Intersection | Direction | Opening Day Traffic LOS | |
|---|---|---|---|
| | | AM Peak Hour | PM Peak Hour |
| **I1** – 9th Street & School Access Road (TWO WAY STOP) | EB | N/A | N/A |
| | WB | N/A | N/A |
| | SB | B | A |
| | NB | C | B |
| **I2** – 4th Street & Beth Avenue (ALL-WAY STOP) | EB | A | A |
| | WB | A | A |
| | SB | A | A |
| | NB | A | A |

# 4 – Proposed Conditions

## Traffic Growth Forecast

The proposed Coyote Creek development generates an estimated 557 weekday trips per day and is considered a small development.

Growth of existing vehicular traffic was estimated using DRCOG 2020 and 2050 ADT estimates. The growth rate was applied to existing volumes to estimate background traffic volumes.

| STREET | GROWTH RATE | SOURCE |
|---|---|---|
| 4th Street | 3.7% | DRCOG |
| 9th Street | 3% | Estimate since no information provided by DRCOG |

## Trip Generation

The ADT and turning movement counts were estimated using the standard ITE Land Use Code 210 for Single-Family Detached based on number units. No adjustments were made for internal capture nor pass-by trips.

**The proposed single-family development of 59 units produces the following volumes based on ITE:**

| Item | Trips Generated | Description |
|---|---|---|
| Average Daily Trips (ADT) | 557 | ADT |
| AM Entering Site | 11 | AM Peak Hour |
| AM Exiting Site | 33 | AM Peak Hour |
| PM Entering Site | 37 | PM Peak Hour |
| PM Exiting Site | 21 | PM Peak Hour |

The Trip Generation report is included in **Appendix 3**.

## Trip Distribution

Based on discussions held with the City of Fort Lupton regarding the distribution of site-generated traffic, it was determined that:

- 80% of vehicles will travel to/from the south via 4th Street
- 20% of vehicles will travel to/from the north via 9th Street

# Site-Generated Trip Assignment & Distribution

Figure 5 shows the site-generated trip assignment and distribution.

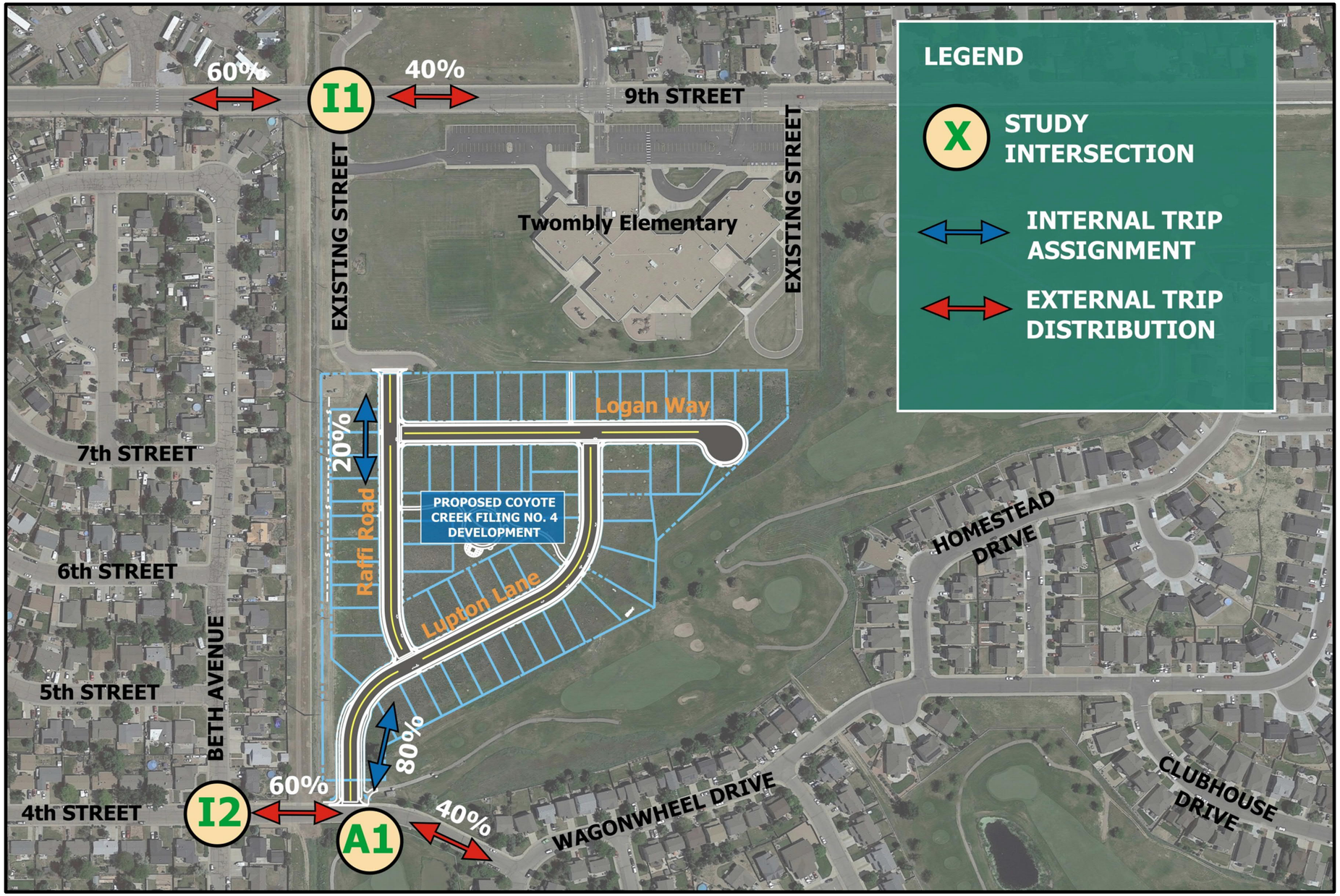



**Figure 5:** Site-Generated Trip Assignment and Distribution

## Site-Generated Peak Hour Traffic Volumes

Figure 6 shows the traffic volumes generated by the proposed development.

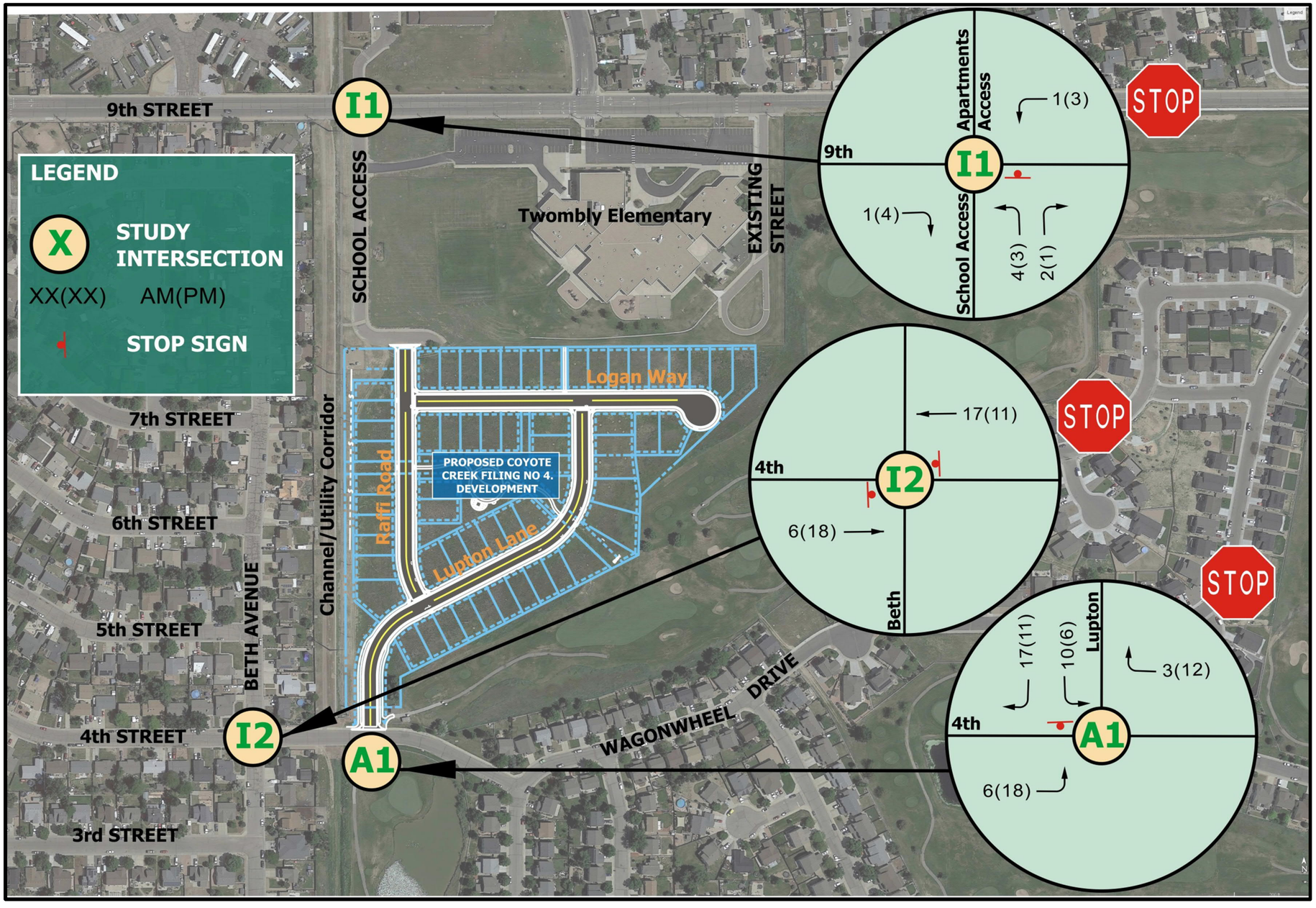



**Figure 6:** Site-Generated Traffic Volumes

# 2022 Opening Day – Peak Hour Background Traffic Volumes

Figure 7 shows the 2022 Opening Day total traffic volumes during the AM and PM peak hours.

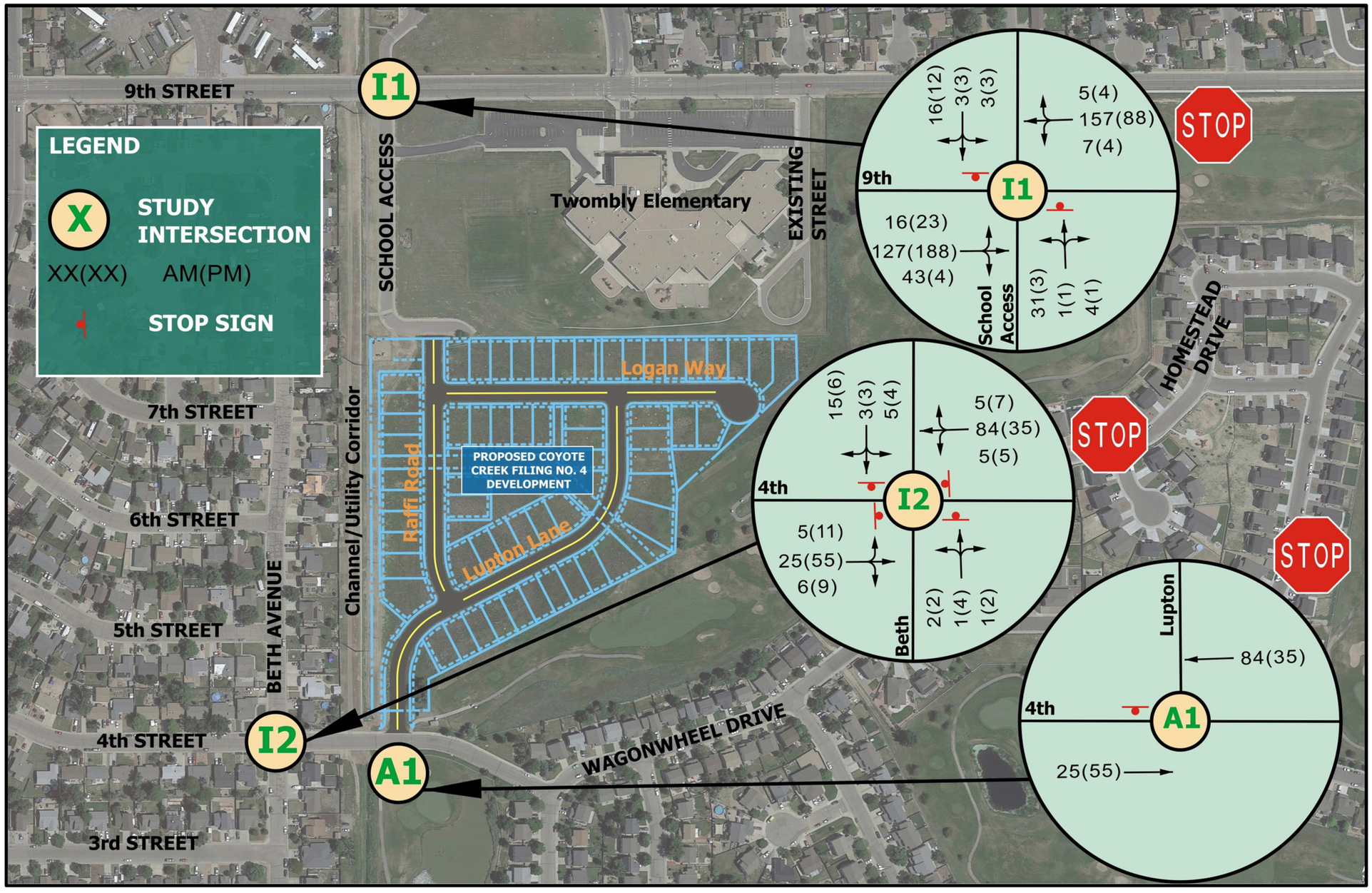



**Figure 7:** Opening Day 2022 Background Traffic Volumes

# 2040 Future Year – Peak Hour Background Traffic Volumes

**Figure 8** shows the 2040 Opening Day total traffic volumes during the AM and PM peak hours.

**Figure 8:** Future Year 2040 Background Traffic Volumes

# 2022 Opening Day – Peak Hour Total Traffic Volumes

**Figure 9** shows the 2022 Opening Day total traffic volumes during the AM and PM peak hours.

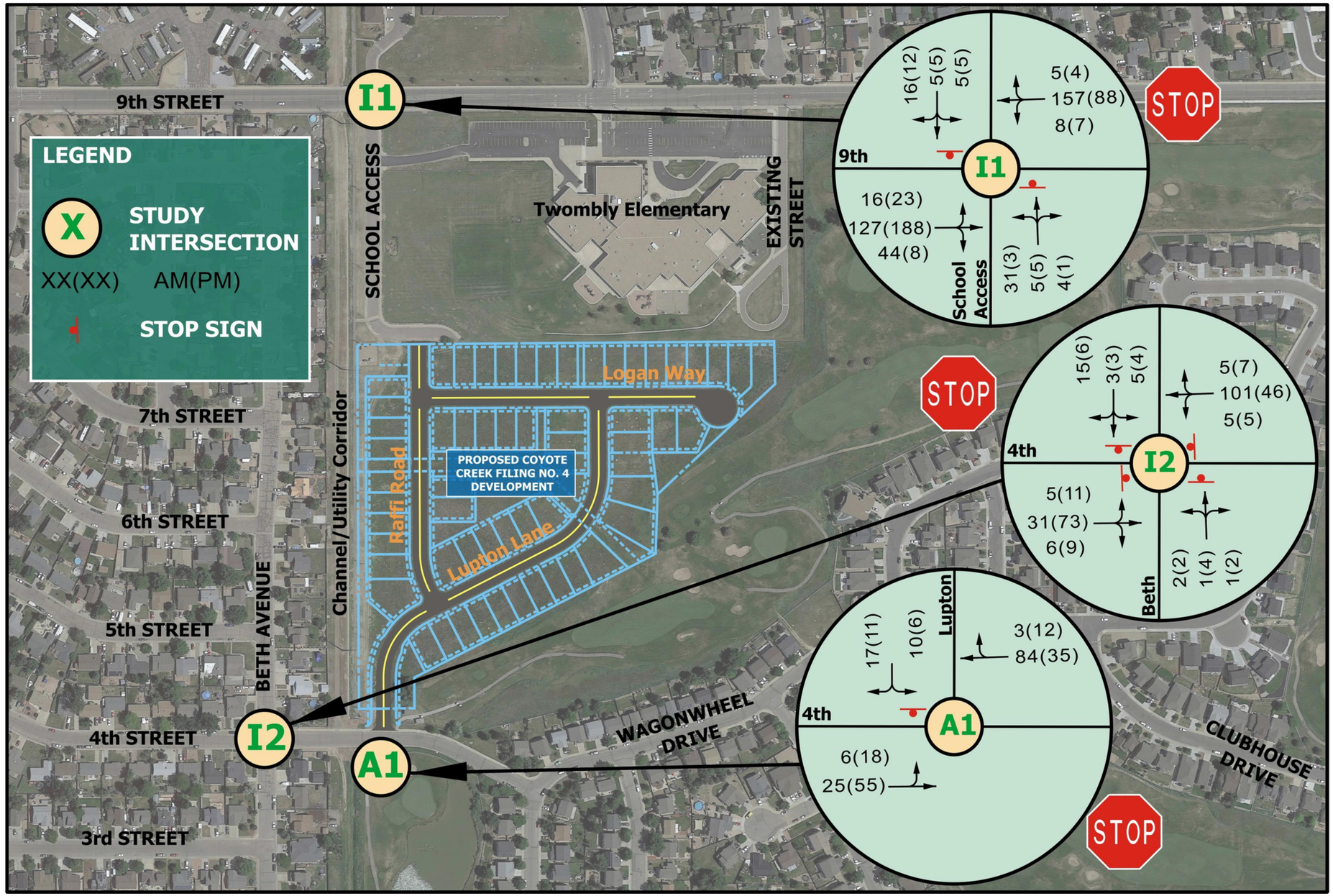



**Figure 9:** Opening Day 2022 Total Traffic Volumes

# 2040 Future Year – Peak Hour Total Traffic Volumes

Figure 10 shows the 2040 Opening Day total traffic volumes during the AM and PM peak hours.

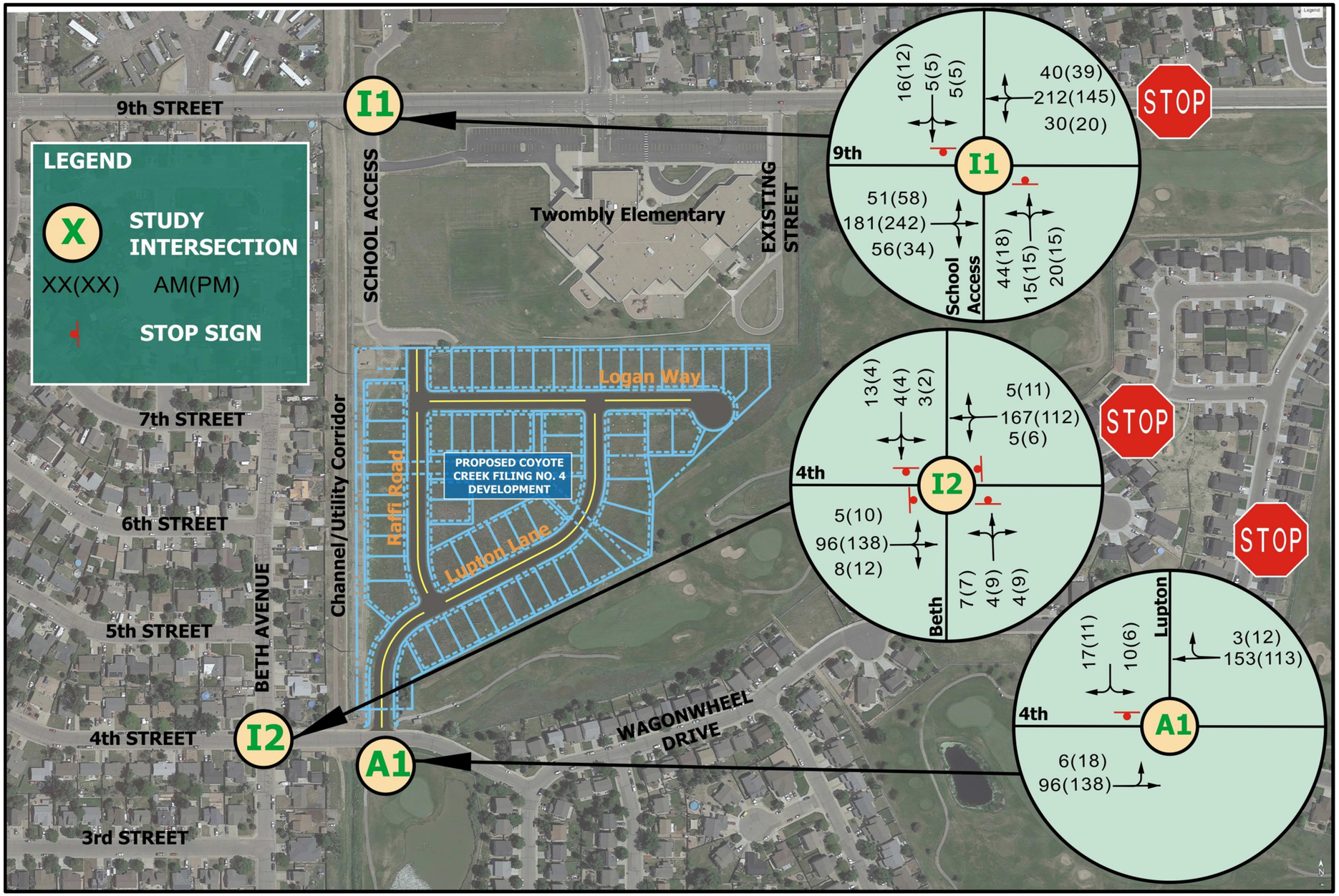



**Figure 10:** Opening Day 2040 Future Year Total Traffic Volumes

# 5 – Traffic Evaluation – Level of Service

## Analysis Methodology

The premise of the Traffic Analysis methodology is as follows:

1. Estimate traffic volumes generated by the development
2. Input estimated volumes into Synchro and analyze the Study Intersection during peak hours
3. Determine operating Level of Service for the Study Intersection during peak hours

The Study intersection was analyzed using the HCM 6th Edition methodology for:

- 2022 Opening Day
- 2040 Future Year

The Synchro report for these analyses are included in **Appendix 4**.

## Peak Hour Definition

Based on the traffic counts, **Table 2** shows the peak hours for 4th Street and 9th Street.

**Table 2 –** Peak Hour Definition

| Peak Hour | Hours |
|---|---|
| Morning (AM Peak) | 7:30 a.m. to 8:30 a.m. |
| Evening (PM Peak) | 5:00 p.m. to 6:00 p.m. |

## Study Intersections – Opening Day 2022 Level of Service

The intersections were analyzed for the 2022 Opening Day scenario. **Table 3** indicates the 2022 Level of Service for the intersection.

**Table 3 –** Stop Controlled Intersection Level of Service – **2022 Opening Day**

| Stop Controlled Intersection | Direction | Opening Day Traffic LOS | |
|---|---|---|---|
| | | AM Peak Hour | PM Peak Hour |
| I1 – 9th & Access (One-Way Stop) | EB | N/A | N/A |
| | WB | N/A | N/A |
| | NB | C | B |
| | SB | B | B |
| I2 – 4th & Beth (All-Way Stop) | EB | A | A |
| | WB | A | A |
| | NB | A | A |
| | SB | A | A |
| A1 – 4th & Logan | EB | N/A | N/A |
| | WB | N/A | N/A |
| | SB | A | A |

## Study Intersections – Future Year 2040 Level of Service

The intersections were analyzed for the 2022 Opening Day scenario. **Table 3** indicates the 2022 Level of Service for the intersection.

**Table 3 –** Stop Controlled Intersection Level of Service – **2040 Future Year**

| Stop Controlled Intersection | Direction | Opening Day Traffic LOS | |
|---|---|---|---|
| | | AM Peak Hour | PM Peak Hour |
| I1 – 9th & Access (One-Way Stop) | EB | N/A | N/A |
| | WB | N/A | N/A |
| | NB | C | C |
| | SB | B | B |
| I2 – 4th & Beth (All-Way Stop) | EB | A | A |
| | WB | A | A |
| | NB | A | A |
| | SB | A | A |
| A1 – 4th & Logan | EB | A | A |
| | WB | A | A |
| | SB | A | A |

# 6 – Improvement Analysis

## Roadway & Intersection Modifications

The existing roadways that will serve the proposed development are classified as follows:

**9th Street –** 2-Lane Urban Collector
**4th Street** – 2-Lane Minor Collector

Based on 2040 Total Traffic volumes, no new turn lanes are anticipated to be required to support the development. There is an existing two-way-left-turn lane on 9th Street that can be re-striped to provide a dedicated left-turn lane for turns into the site access road.

## Traffic Signal Warrant Analysis

A peak hour signal warrant analysis was conducted for:

- 4th & Beth
- 9th & School Access/Apartment Access

For the signal warrant analysis, 2040 Future Year traffic volumes were used.

**4th & Beth -** ***Does not meet Peak Hour Warrant in 2040***

**9th & School Access/Apartment Access -** ***Does not meet Peak Hour Warrant in 2040***

The intersection was analyzed for Warrant 3, Peak Hour according to the MUTCD. The intersection did not meet this warrant for signalization due to low traffic volumes on all approaches.

# 7 – Conclusion

The proposed development along 4th Street is expected to have no significant impact on existing infrastructure traffic operations. Below is a summary of the findings of this TIS.

## Site Generated Traffic

| Item | Trips Generated | Description |
|---|---|---|
| Average Daily Trips (ADT) | 557 | ADT |
| AM Entering Site | 11 | AM Peak Hour |
| AM Exiting Site | 33 | AM Peak Hour |
| PM Entering Site | 37 | PM Peak Hour |
| PM Exiting Site | 21 | PM Peak Hour |

## Evaluation Conclusions

| Description | Evaluation |
|---|---|
| Intersection Analysis<br>Existing Conditions | I1: 9th Street & School Access Road: All approaches Level of Service C or better<br>I2: 4th Street & Beth Avenue: All approaches Level of Service A |
| Intersection Analysis<br>2022 Opening Day | I1: 9th Street & School Access Road: All approaches Level of Service C or better<br>I2: 4th Street & Beth Avenue: All approaches Level of Service A<br>A1: 4th Street & Access/Logan: All approaches Level of Service A |
| Intersection Analysis<br>2040 Future Year | I1: 9th Street & School Access Road: All approaches Level of Service C or better<br>I2: 4th Street & Beth Avenue: All approaches Level of Service A<br>A1: 4th Street & Access/Logan: All approaches Level of Service A |
| Proposed Roadway Improvements<br>(Turn lanes, acceleration lanes, etc) | Due to low traffic volumes and high Levels of Service, no new turn lane improvements are expected to be required to support movements to and from the development. There is an existing two-way-left-turn lane on 9th Street that can be re-striped to provide a westbound left-turn lane to the access road to the site |
| Traffic Signal Warrants | None of the study intersections will meet Peak Hour warrants for 2040 Future Year |

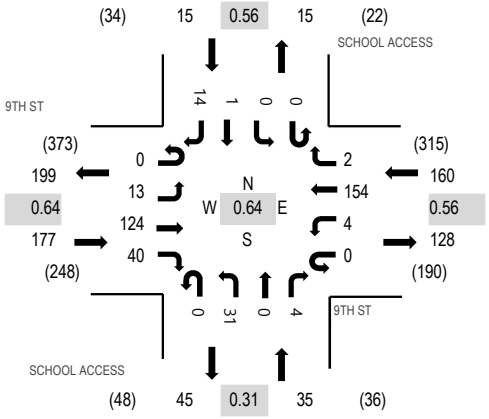
# APPENDIX 1

## Existing Traffic Counts

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

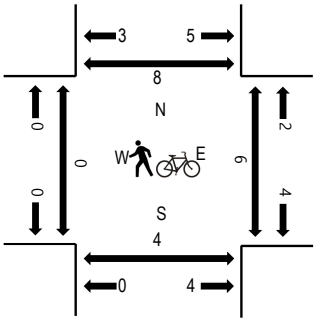
**Location:** 1 SCHOOL ACCESS & 9TH ST AM
**Date:** Tuesday, November 9, 2021
**Peak Hour:** 07:30 AM - 08:30 AM
**Peak 15-Minutes:** 08:15 AM - 08:30 AM

## Peak Hour - All Vehicles




Note: Total study counts contained in parentheses.

## Peak Hour - Pedestrians/Bicycles on Crosswalk



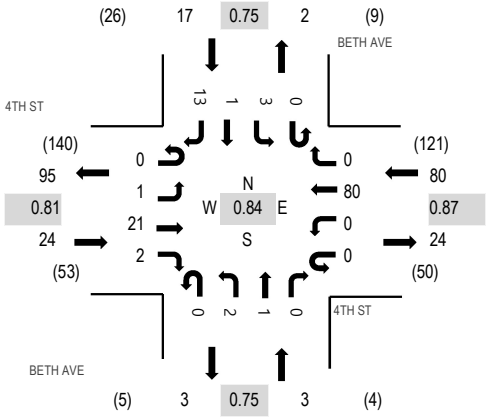

## Traffic Counts

| Interval Start Time | 9TH ST Eastbound | | | | 9TH ST Westbound | | | | SCHOOL ACCESS Northbound | | | | SCHOOL ACCESS Southbound | | | | | Rolling Hour | Pedestrian Crossings | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | U-Turn | Left | Thru | Right | U-Turn | Left | Thru | Right | U-Turn | Left | Thru | Right | U-Turn | Left | Thru | Right | Total | | West | East | South | North |
| 7:00 AM | 0 | 2 | 15 | 1 | 0 | 0 | 56 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 6 | 81 | 299 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 4 | 25 | 2 | 0 | 0 | 55 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 11 | 98 | 334 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 3 | 25 | 8 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 59 | 387 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 2 | 21 | 4 | 0 | 0 | 27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 61 | 366 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 3 | 55 | 11 | 0 | 4 | 34 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 1 | 1 | 116 | 334 | 0 | 0 | 2 | 1 |
| 8:15 AM | 0 | 5 | 23 | 17 | 0 | 0 | 72 | 2 | 0 | 24 | 0 | 4 | 0 | 0 | 0 | 4 | 151 | | 0 | 6 | 0 | 6 |
| 8:30 AM | 0 | 1 | 10 | 0 | 0 | 0 | 26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 38 | | 0 | 0 | 0 | 1 |
| 8:45 AM | 0 | 0 | 11 | 0 | 0 | 0 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 29 | | 0 | 0 | 0 | 0 |
| Count Total | 0 | 20 | 185 | 43 | 0 | 4 | 309 | 2 | 0 | 32 | 0 | 4 | 0 | 1 | 1 | 32 | 633 | | 0 | 6 | 2 | 8 |
| Peak Hour | 0 | 13 | 124 | 40 | 0 | 4 | 154 | 2 | 0 | 31 | 0 | 4 | 0 | 0 | 1 | 14 | 387 | | 0 | 6 | 2 | 7 |

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

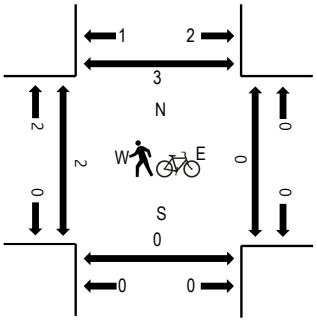
**Location:** 2 BETH AVE & 4TH ST AM
**Date:** Tuesday, November 9, 2021
**Peak Hour:** 07:00 AM - 08:00 AM
**Peak 15-Minutes:** 07:15 AM - 07:30 AM

## Peak Hour - All Vehicles




Note: Total study counts contained in parentheses.

## Peak Hour - Pedestrians/Bicycles on Crosswalk



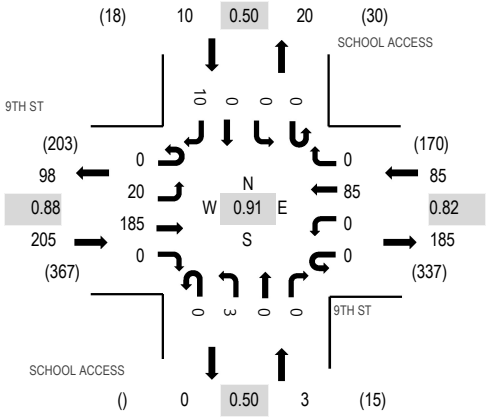

## Traffic Counts

| Interval Start Time | 4TH ST Eastbound | | | | 4TH ST Westbound | | | | BETH AVE Northbound | | | | BETH AVE Southbound | | | | Total | Rolling Hour | Pedestrian Crossings | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | U-Turn | Left | Thru | Right | U-Turn | Left | Thru | Right | U-Turn | Left | Thru | Right | U-Turn | Left | Thru | Right | | | West | East | South | North |
| 7:00 AM | 0 | 1 | 6 | 2 | 0 | 0 | 22 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 4 | 36 | 124 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 7 | 0 | 0 | 0 | 23 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 5 | 37 | 117 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 2 | 0 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 20 | 95 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 6 | 0 | 0 | 0 | 19 | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 3 | 31 | 93 | 2 | 0 | 0 | 3 |
| 8:00 AM | 0 | 1 | 6 | 0 | 0 | 0 | 14 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 29 | 80 | 0 | 0 | 0 | 3 |
| 8:15 AM | 0 | 0 | 6 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 1 | 7 | 1 | 0 | 0 | 6 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 18 | | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 1 | 5 | 1 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 18 | | 0 | 0 | 0 | 0 |
| Count Total | 0 | 4 | 45 | 4 | 0 | 0 | 118 | 3 | 0 | 2 | 2 | 0 | 0 | 5 | 1 | 20 | 204 | | 2 | 0 | 0 | 6 |
| Peak Hour | 0 | 1 | 21 | 2 | 0 | 0 | 80 | 0 | 0 | 2 | 1 | 0 | 0 | 3 | 1 | 13 | 124 | | 2 | 0 | 0 | 3 |

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

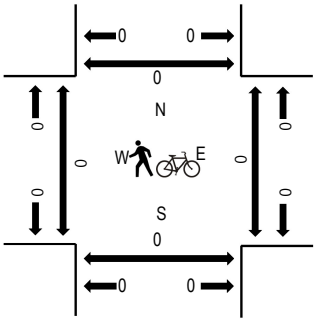
**Location:** 1 SCHOOL ACCESS & 9TH ST PM
**Date:** Tuesday, November 9, 2021
**Peak Hour:** 05:00 PM - 06:00 PM
**Peak 15-Minutes:** 05:15 PM - 05:30 PM

## Peak Hour - All Vehicles




Note: Total study counts contained in parentheses.

## Peak Hour - Pedestrians/Bicycles on Crosswalk



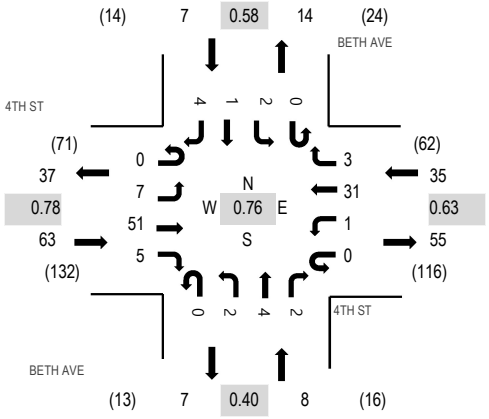

## Traffic Counts

| Interval Start Time | 9TH ST Eastbound | | | | 9TH ST Westbound | | | | SCHOOL ACCESS Northbound | | | | SCHOOL ACCESS Southbound | | | | | Rolling Hour | Pedestrian Crossings | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | U-Turn | Left | Thru | Right | U-Turn | Left | Thru | Right | U-Turn | Left | Thru | Right | U-Turn | Left | Thru | Right | Total | | West | East | South | North |
| 4:00 PM | 0 | 2 | 44 | 0 | 0 | 0 | 26 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 3 | 81 | 267 | 0 | 0 | 1 | 0 |
| 4:15 PM | 0 | 3 | 31 | 0 | 0 | 0 | 21 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 59 | 262 | 0 | 1 | 1 | 0 |
| 4:30 PM | 0 | 1 | 30 | 0 | 0 | 0 | 16 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | 286 | 0 | 0 | 0 | 2 |
| 4:45 PM | 0 | 4 | 47 | 0 | 0 | 0 | 22 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 3 | 77 | 302 | 0 | 0 | 0 | 1 |
| 5:00 PM | 0 | 5 | 45 | 0 | 0 | 0 | 22 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 76 | 303 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 3 | 55 | 0 | 0 | 0 | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 83 | | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 6 | 40 | 0 | 0 | 0 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 66 | | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 6 | 45 | 0 | 0 | 0 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 78 | | 0 | 0 | 0 | 0 |
| Count Total | 0 | 30 | 337 | 0 | 0 | 0 | 170 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 18 | 570 | | 0 | 1 | 2 | 3 |
| Peak Hour | 0 | 20 | 185 | 0 | 0 | 0 | 85 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 10 | 303 | | 0 | 0 | 0 | 0 |

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

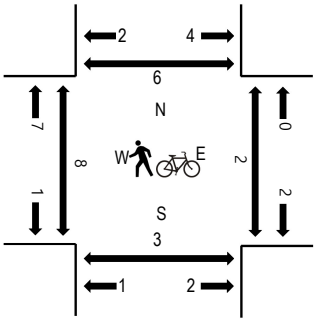
**Location:** 2 BETH AVE & 4TH ST PM
**Date:** Tuesday, November 9, 2021
**Peak Hour:** 04:00 PM - 05:00 PM
**Peak 15-Minutes:** 04:00 PM - 04:15 PM

## Peak Hour - All Vehicles




Note: Total study counts contained in parentheses.

## Peak Hour - Pedestrians/Bicycles on Crosswalk




## Traffic Counts

| Interval Start Time | 4TH ST Eastbound | | | | 4TH ST Westbound | | | | BETH AVE Northbound | | | | BETH AVE Southbound | | | | Total | Rolling Hour | Pedestrian Crossings | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | U-Turn | Left | Thru | Right | U-Turn | Left | Thru | Right | U-Turn | Left | Thru | Right | U-Turn | Left | Thru | Right | | | West | East | South | North |
| 4:00 PM | 0 | 3 | 11 | 1 | 0 | 1 | 12 | 1 | 0 | 2 | 1 | 2 | 0 | 1 | 0 | 2 | 37 | 113 | 2 | 2 | 0 | 1 |
| 4:15 PM | 0 | 1 | 15 | 3 | 0 | 0 | 9 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 30 | 99 | 5 | 0 | 2 | 4 |
| 4:30 PM | 0 | 1 | 12 | 1 | 0 | 0 | 5 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 22 | 98 | 1 | 0 | 1 | 1 |
| 4:45 PM | 0 | 2 | 13 | 0 | 0 | 0 | 5 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 24 | 101 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 12 | 0 | 0 | 0 | 7 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 23 | 111 | 0 | 0 | 3 | 0 |
| 5:15 PM | 0 | 3 | 18 | 1 | 0 | 0 | 4 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 29 | | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 3 | 14 | 1 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 25 | | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 1 | 14 | 2 | 0 | 0 | 10 | 1 | 0 | 3 | 0 | 0 | 0 | 1 | 0 | 2 | 34 | | 0 | 0 | 0 | 0 |
| Count Total | 0 | 14 | 109 | 9 | 0 | 1 | 56 | 5 | 1 | 6 | 5 | 4 | 0 | 3 | 2 | 9 | 224 | | 8 | 2 | 6 | 6 |
| Peak Hour | 0 | 7 | 51 | 5 | 0 | 1 | 31 | 3 | 0 | 2 | 4 | 2 | 0 | 2 | 1 | 4 | 113 | | 8 | 2 | 3 | 6 |

# APPENDIX 2

## Trip Generation Report

## Trip Generation Summary

Alternative: Alternative 1
Phase:
Project: Coyote Creek PA-4

Open Date: 11/8/2021
Analysis Date: 11/8/2021

| ITE | Land Use | | Weekday Average Daily Trips | | | Weekday AM Peak Hour of Adjacent Street Traffic | | | Weekday PM Peak Hour of Adjacent Street Traffic | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | * | Enter | Exit | Total | Enter | Exit | Total | Enter | Exit | Total |
| 210 | SFHOUSE 1 | | 279 | 278 | 557 | 11 | 33 | 44 | 37 | 21 | 58 |
| | 59 Dwelling Units | | | | | | | | | | |
| Unadjusted Volume | | | 279 | 278 | 557 | 11 | 33 | 44 | 37 | 21 | 58 |
| Internal Capture Trips | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-By Trips | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Volume Added to Adjacent Streets | | | 279 | 278 | 557 | 11 | 33 | 44 | 37 | 21 | 58 |

Total Weekday Average Daily Trips Internal Capture = 0 Percent
Total Weekday AM Peak Hour of Adjacent Street Traffic Internal Capture = 0 Percent
Total Weekday PM Peak Hour of Adjacent Street Traffic Internal Capture = 0 Percent

* - Custom rate used for selected time period.

Source: Institute of Transportation Engineers, Trip Generation Manual 10th Edition
**TRIP GENERATION 10, TRAFFICWARE, LLC**

**Detailed Land Use Data**

For 59 Dwelling Units of SFHOUSE 1

( 210 ) Single-Family Detached Housing

Open Date: 11/8/2021

Project: Coyote Creek PA-4

Analysis Date: 11/8/2021

| Day / Period | Total Trips | Pass-By Trips | Avg Rate | Min Rate | Max Rate | Std Dev | Avg Size | % Enter | % Exit | Use Eq. | Equation | R2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Weekday Average Daily Trips | 557 | 0 | 9.44 | 4.81 | 19.39 | 2.1 | 264 | 50 | 50 | False | Ln(T) = 0.92 Ln(X) + 2.71 | 0.95 |
| Source : Trip Generation Manual 10th Edition | | | | | | | | | | | | |
| Weekday AM Peak Hour of Adjacent Street Traffic | 44 | 0 | 0.74 | 0.33 | 2.27 | 0.27 | 219 | 25 | 75 | False | T = 0.71(X) + 4.8 | 0.89 |
| Source : Trip Generation Manual 10th Edition | | | | | | | | | | | | |
| Weekday PM Peak Hour of Adjacent Street Traffic | 58 | 0 | 0.99 | 0.44 | 2.98 | 0.31 | 242 | 63 | 37 | False | Ln(T) = 0.96 Ln(X) + 0.2 | 0.92 |
| Source : Trip Generation Manual 10th Edition | | | | | | | | | | | | |

# APPENDIX 3

## Synchro Reports

| Intersection | |
|---|---|
| Int Delay, s/veh | 3.4 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ⇕ | | | ⇕ | | | ⇕ | | | ⇕ | |
| Traffic Vol, veh/h | 13 | 124 | 40 | 4 | 154 | 2 | 31 | 1 | 4 | 1 | 1 | 14 |
| Future Vol, veh/h | 13 | 124 | 40 | 4 | 154 | 2 | 31 | 1 | 4 | 1 | 1 | 14 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 64 | 64 | 64 | 56 | 56 | 56 | 31 | 31 | 31 | 56 | 56 | 56 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 20 | 194 | 63 | 7 | 275 | 4 | 100 | 3 | 13 | 2 | 2 | 25 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 279 | 0 | 0 | 257 | 0 | 0 | 571 | 559 | 226 | 565 | 588 | 277 |
| Stage 1 | - | - | - | - | - | - | 266 | 266 | - | 291 | 291 | - |
| Stage 2 | - | - | - | - | - | - | 305 | 293 | - | 274 | 297 | - |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.318 |
| Pot Cap-1 Maneuver | 1284 | - | - | 1308 | - | - | 432 | 438 | 813 | 436 | 421 | 762 |
| Stage 1 | - | - | - | - | - | - | 739 | 689 | - | 717 | 672 | - |
| Stage 2 | - | - | - | - | - | - | 705 | 670 | - | 732 | 668 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1284 | - | - | 1308 | - | - | 409 | 427 | 813 | 419 | 411 | 762 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 409 | 427 | - | 419 | 411 | - |
| Stage 1 | - | - | - | - | - | - | 726 | 677 | - | 704 | 668 | - |
| Stage 2 | - | - | - | - | - | - | 676 | 666 | - | 704 | 656 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0.6 | 0.2 | 16.3 | 10.4 |
| HCM LOS | | | C | B |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 433 | 1284 | - | - | 1308 | - | - | 690 |
| HCM Lane V/C Ratio | 0.268 | 0.016 | - | - | 0.005 | - | - | 0.041 |
| HCM Control Delay (s) | 16.3 | 7.8 | 0 | - | 7.8 | 0 | - | 10.4 |
| HCM Lane LOS | C | A | A | - | A | A | - | B |
| HCM 95th %tile Q(veh) | 1.1 | 0 | - | - | 0 | - | - | 0.1 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.2 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Vol, veh/h | 20 | 185 | 1 | 1 | 85 | 1 | 1 | 1 | 1 | 1 | 1 | 10 |
| Future Vol, veh/h | 20 | 185 | 1 | 1 | 85 | 1 | 1 | 1 | 1 | 1 | 1 | 10 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 88 | 88 | 88 | 82 | 82 | 82 | 50 | 50 | 50 | 50 | 50 | 50 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 23 | 210 | 1 | 1 | 104 | 1 | 2 | 2 | 2 | 2 | 2 | 20 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 105 | 0 | 0 | 211 | 0 | 0 | 375 | 364 | 211 | 366 | 364 | 105 |
| Stage 1 | - | - | - | - | - | - | 257 | 257 | - | 107 | 107 | - |
| Stage 2 | - | - | - | - | - | - | 118 | 107 | - | 259 | 257 | - |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.318 |
| Pot Cap-1 Maneuver | 1486 | - | - | 1360 | - | - | 582 | 564 | 829 | 590 | 564 | 949 |
| Stage 1 | - | - | - | - | - | - | 748 | 695 | - | 898 | 807 | - |
| Stage 2 | - | - | - | - | - | - | 887 | 807 | - | 746 | 695 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1486 | - | - | 1360 | - | - | 560 | 553 | 829 | 578 | 553 | 949 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 560 | 553 | - | 578 | 553 | - |
| Stage 1 | - | - | - | - | - | - | 735 | 682 | - | 882 | 806 | - |
| Stage 2 | - | - | - | - | - | - | 865 | 806 | - | 729 | 682 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0.7 | 0.1 | 10.8 | 9.3 |
| HCM LOS | | | B | A |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 625 | 1486 | - | - | 1360 | - | - | 853 |
| HCM Lane V/C Ratio | 0.01 | 0.015 | - | - | 0.001 | - | - | 0.028 |
| HCM Control Delay (s) | 10.8 | 7.5 | 0 | - | 7.6 | 0 | - | 9.3 |
| HCM Lane LOS | B | A | A | - | A | A | - | A |
| HCM 95th %tile Q(veh) | 0 | 0 | - | - | 0 | - | - | 0.1 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 7.3 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 1 | 21 | 2 | 1 | 80 | 1 | 2 | 1 | 1 | 3 | 1 | 13 |
| Future Vol, veh/h | 1 | 21 | 2 | 1 | 80 | 1 | 2 | 1 | 1 | 3 | 1 | 13 |
| Peak Hour Factor | 0.81 | 0.81 | 0.81 | 0.87 | 0.87 | 0.87 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 1 | 26 | 2 | 1 | 92 | 1 | 3 | 1 | 1 | 4 | 1 | 17 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay | 7.2 | 7.5 | 7.2 | 6.9 |
| HCM LOS | A | A | A | A |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 50% | 4% | 1% | 18% |
| Vol Thru, % | 25% | 88% | 98% | 6% |
| Vol Right, % | 25% | 8% | 1% | 76% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 4 | 24 | 82 | 17 |
| LT Vol | 2 | 1 | 1 | 3 |
| Through Vol | 1 | 21 | 80 | 1 |
| RT Vol | 1 | 2 | 1 | 13 |
| Lane Flow Rate | 5 | 30 | 94 | 23 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.006 | 0.033 | 0.105 | 0.023 |
| Departure Headway (Hd) | 4.116 | 4.012 | 4 | 3.728 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 863 | 892 | 898 | 952 |
| Service Time | 2.173 | 2.038 | 2.014 | 1.783 |
| HCM Lane V/C Ratio | 0.006 | 0.034 | 0.105 | 0.024 |
| HCM Control Delay | 7.2 | 7.2 | 7.5 | 6.9 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0 | 0.1 | 0.4 | 0.1 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 7.5 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 1 | 21 | 2 | 1 | 80 | 1 | 2 | 1 | 1 | 3 | 1 | 13 |
| Future Vol, veh/h | 1 | 21 | 2 | 1 | 80 | 1 | 2 | 1 | 1 | 3 | 1 | 13 |
| Peak Hour Factor | 0.78 | 0.78 | 0.78 | 0.63 | 0.63 | 0.63 | 0.40 | 0.40 | 0.40 | 0.58 | 0.58 | 0.58 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 1 | 27 | 3 | 2 | 127 | 2 | 5 | 3 | 3 | 5 | 2 | 22 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay | 7.2 | 7.7 | 7.3 | 7 |
| HCM LOS | A | A | A | A |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 50% | 4% | 1% | 18% |
| Vol Thru, % | 25% | 88% | 98% | 6% |
| Vol Right, % | 25% | 8% | 1% | 76% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 4 | 24 | 82 | 17 |
| LT Vol | 2 | 1 | 1 | 3 |
| Through Vol | 1 | 21 | 80 | 1 |
| RT Vol | 1 | 2 | 1 | 13 |
| Lane Flow Rate | 10 | 31 | 130 | 29 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.012 | 0.035 | 0.145 | 0.031 |
| Departure Headway (Hd) | 4.185 | 4.059 | 4.02 | 3.796 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 845 | 878 | 893 | 931 |
| Service Time | 2.262 | 2.1 | 2.043 | 1.869 |
| HCM Lane V/C Ratio | 0.012 | 0.035 | 0.146 | 0.031 |
| HCM Control Delay | 7.3 | 7.2 | 7.7 | 7 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0 | 0.1 | 0.5 | 0.1 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 4.3 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ⇕ | | | ⇕ | | | ⇕ | | | ⇕ | |
| Traffic Vol, veh/h | 16 | 127 | 44 | 8 | 157 | 5 | 31 | 5 | 4 | 5 | 5 | 16 |
| Future Vol, veh/h | 16 | 127 | 44 | 8 | 157 | 5 | 31 | 5 | 4 | 5 | 5 | 16 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 64 | 64 | 64 | 56 | 56 | 56 | 31 | 31 | 31 | 56 | 56 | 56 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 25 | 198 | 69 | 14 | 280 | 9 | 100 | 16 | 13 | 9 | 9 | 29 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 289 | 0 | 0 | 267 | 0 | 0 | 615 | 600 | 233 | 610 | 630 | 285 |
| Stage 1 | - | - | - | - | - | - | 283 | 283 | - | 313 | 313 | - |
| Stage 2 | - | - | - | - | - | - | 332 | 317 | - | 297 | 317 | - |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.318 |
| Pot Cap-1 Maneuver | 1273 | - | - | 1297 | - | - | 403 | 415 | 806 | 407 | 399 | 754 |
| Stage 1 | - | - | - | - | - | - | 724 | 677 | - | 698 | 657 | - |
| Stage 2 | - | - | - | - | - | - | 681 | 654 | - | 712 | 654 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1273 | - | - | 1297 | - | - | 370 | 400 | 806 | 378 | 385 | 754 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 370 | 400 | - | 378 | 385 | - |
| Stage 1 | - | - | - | - | - | - | 707 | 661 | - | 682 | 648 | - |
| Stage 2 | - | - | - | - | - | - | 638 | 645 | - | 668 | 639 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0.7 | 0.4 | 18.5 | 12.2 |
| HCM LOS | | | C | B |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 395 | 1273 | - | - | 1297 | - | - | 548 |
| HCM Lane V/C Ratio | 0.327 | 0.02 | - | - | 0.011 | - | - | 0.085 |
| HCM Control Delay (s) | 18.5 | 7.9 | 0 | - | 7.8 | 0 | - | 12.2 |
| HCM Lane LOS | C | A | A | - | A | A | - | B |
| HCM 95th %tile Q(veh) | 1.4 | 0.1 | - | - | 0 | - | - | 0.3 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 2.2 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ⇕ | | | ⇕ | | | ⇕ | | | ⇕ | |
| Traffic Vol, veh/h | 23 | 188 | 8 | 7 | 88 | 4 | 3 | 5 | 1 | 5 | 5 | 12 |
| Future Vol, veh/h | 23 | 188 | 8 | 7 | 88 | 4 | 3 | 5 | 1 | 5 | 5 | 12 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 88 | 88 | 88 | 82 | 82 | 82 | 50 | 50 | 50 | 50 | 50 | 50 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 26 | 214 | 9 | 9 | 107 | 5 | 6 | 10 | 2 | 10 | 10 | 24 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 112 | 0 | 0 | 223 | 0 | 0 | 416 | 401 | 219 | 405 | 403 | 110 |
| Stage 1 | - | - | - | - | - | - | 271 | 271 | - | 128 | 128 | - |
| Stage 2 | - | - | - | - | - | - | 145 | 130 | - | 277 | 275 | - |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.318 |
| Pot Cap-1 Maneuver | 1478 | - | - | 1346 | - | - | 547 | 538 | 821 | 556 | 536 | 943 |
| Stage 1 | - | - | - | - | - | - | 735 | 685 | - | 876 | 790 | - |
| Stage 2 | - | - | - | - | - | - | 858 | 789 | - | 729 | 683 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1478 | - | - | 1346 | - | - | 515 | 523 | 821 | 535 | 522 | 943 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 515 | 523 | - | 535 | 522 | - |
| Stage 1 | - | - | - | - | - | - | 720 | 671 | - | 858 | 784 | - |
| Stage 2 | - | - | - | - | - | - | 820 | 783 | - | 702 | 669 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0.8 | 0.5 | 11.9 | 10.5 |
| HCM LOS | | | B | B |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 542 | 1478 | - | - | 1346 | - | - | 695 |
| HCM Lane V/C Ratio | 0.033 | 0.018 | - | - | 0.006 | - | - | 0.063 |
| HCM Control Delay (s) | 11.9 | 7.5 | 0 | - | 7.7 | 0 | - | 10.5 |
| HCM Lane LOS | B | A | A | - | A | A | - | B |
| HCM 95th %tile Q(veh) | 0.1 | 0.1 | - | - | 0 | - | - | 0.2 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 7.5 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 5 | 31 | 6 | 5 | 101 | 5 | 2 | 1 | 1 | 5 | 3 | 15 |
| Future Vol, veh/h | 5 | 31 | 6 | 5 | 101 | 5 | 2 | 1 | 1 | 5 | 3 | 15 |
| Peak Hour Factor | 0.81 | 0.81 | 0.81 | 0.87 | 0.87 | 0.87 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 6 | 38 | 7 | 6 | 116 | 6 | 3 | 1 | 1 | 7 | 4 | 20 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay | 7.3 | 7.7 | 7.3 | 7.1 |
| HCM LOS | A | A | A | A |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 50% | 12% | 5% | 22% |
| Vol Thru, % | 25% | 74% | 91% | 13% |
| Vol Right, % | 25% | 14% | 5% | 65% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 4 | 42 | 111 | 23 |
| LT Vol | 2 | 5 | 5 | 5 |
| Through Vol | 1 | 31 | 101 | 3 |
| RT Vol | 1 | 6 | 5 | 15 |
| Lane Flow Rate | 5 | 52 | 128 | 31 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.006 | 0.058 | 0.142 | 0.033 |
| Departure Headway (Hd) | 4.216 | 4.03 | 4.018 | 3.898 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 837 | 886 | 893 | 906 |
| Service Time | 2.301 | 2.069 | 2.042 | 1.977 |
| HCM Lane V/C Ratio | 0.006 | 0.059 | 0.143 | 0.034 |
| HCM Control Delay | 7.3 | 7.3 | 7.7 | 7.1 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0 | 0.2 | 0.5 | 0.1 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 7.5 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 11 | 73 | 9 | 5 | 46 | 7 | 2 | 4 | 2 | 4 | 3 | 6 |
| Future Vol, veh/h | 11 | 73 | 9 | 5 | 46 | 7 | 2 | 4 | 2 | 4 | 3 | 6 |
| Peak Hour Factor | 0.81 | 0.81 | 0.81 | 0.87 | 0.87 | 0.87 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 14 | 90 | 11 | 6 | 53 | 8 | 3 | 5 | 3 | 5 | 4 | 8 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay | 7.6 | 7.4 | 7.3 | 7.2 |
| HCM LOS | A | A | A | A |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 25% | 12% | 9% | 31% |
| Vol Thru, % | 50% | 78% | 79% | 23% |
| Vol Right, % | 25% | 10% | 12% | 46% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 8 | 93 | 58 | 13 |
| LT Vol | 2 | 11 | 5 | 4 |
| Through Vol | 4 | 73 | 46 | 3 |
| RT Vol | 2 | 9 | 7 | 6 |
| Lane Flow Rate | 11 | 115 | 67 | 17 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.012 | 0.127 | 0.074 | 0.019 |
| Departure Headway (Hd) | 4.159 | 3.996 | 4.012 | 4.038 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 849 | 897 | 891 | 875 |
| Service Time | 2.239 | 2.023 | 2.047 | 2.117 |
| HCM Lane V/C Ratio | 0.013 | 0.128 | 0.075 | 0.019 |
| HCM Control Delay | 7.3 | 7.6 | 7.4 | 7.2 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0 | 0.4 | 0.2 | 0.1 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 2 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 6 | 25 | 84 | 3 | 10 | 17 |
| Future Vol, veh/h | 6 | 25 | 84 | 3 | 10 | 17 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 0 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 7 | 27 | 91 | 3 | 11 | 18 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 94 | 0 | - | 0 | 134 | 93 |
| Stage 1 | - | - | - | - | 93 | - |
| Stage 2 | - | - | - | - | 41 | - |
| Critical Hdwy | 4.12 | - | - | - | 6.42 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.42 | - |
| Follow-up Hdwy | 2.218 | - | - | - | 3.518 | 3.318 |
| Pot Cap-1 Maneuver | 1500 | - | - | - | 860 | 964 |
| Stage 1 | - | - | - | - | 931 | - |
| Stage 2 | - | - | - | - | 981 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 1500 | - | - | - | 856 | 964 |
| Mov Cap-2 Maneuver | - | - | - | - | 856 | - |
| Stage 1 | - | - | - | - | 926 | - |
| Stage 2 | - | - | - | - | 981 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s | 1.4 | 0 | 9 |
| HCM LOS | | | A |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1500 | - | - | - | 921 |
| HCM Lane V/C Ratio | 0.004 | - | - | - | 0.032 |
| HCM Control Delay (s) | 7.4 | 0 | - | - | 9 |
| HCM Lane LOS | A | A | - | - | A |
| HCM 95th %tile Q(veh) | 0 | - | - | - | 0.1 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 2.1 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 18 | 55 | 35 | 12 | 6 | 11 |
| Future Vol, veh/h | 18 | 55 | 35 | 12 | 6 | 11 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 0 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 20 | 60 | 38 | 13 | 7 | 12 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 51 | 0 | - | 0 | 145 | 45 |
| Stage 1 | - | - | - | - | 45 | - |
| Stage 2 | - | - | - | - | 100 | - |
| Critical Hdwy | 4.12 | - | - | - | 6.42 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.42 | - |
| Follow-up Hdwy | 2.218 | - | - | - | 3.518 | 3.318 |
| Pot Cap-1 Maneuver | 1555 | - | - | - | 847 | 1025 |
| Stage 1 | - | - | - | - | 977 | - |
| Stage 2 | - | - | - | - | 924 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 1555 | - | - | - | 836 | 1025 |
| Mov Cap-2 Maneuver | - | - | - | - | 836 | - |
| Stage 1 | - | - | - | - | 964 | - |
| Stage 2 | - | - | - | - | 924 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s | 1.8 | 0 | 8.9 |
| HCM LOS | | | A |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1555 | - | - | - | 949 |
| HCM Lane V/C Ratio | 0.013 | - | - | - | 0.019 |
| HCM Control Delay (s) | 7.3 | 0 | - | - | 8.9 |
| HCM Lane LOS | A | A | - | - | A |
| HCM 95th %tile Q(veh) | 0 | - | - | - | 0.1 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 3.8 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ⇕ | | | ⇕ | | | ⇕ | | | ⇕ | |
| Traffic Vol, veh/h | 51 | 181 | 56 | 30 | 212 | 40 | 44 | 15 | 20 | 5 | 5 | 16 |
| Future Vol, veh/h | 51 | 181 | 56 | 30 | 212 | 40 | 44 | 15 | 20 | 5 | 5 | 16 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 64 | 226 | 70 | 38 | 265 | 50 | 55 | 19 | 25 | 6 | 6 | 20 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 315 | 0 | 0 | 296 | 0 | 0 | 768 | 780 | 261 | 777 | 790 | 290 |
| Stage 1 | - | - | - | - | - | - | 389 | 389 | - | 366 | 366 | - |
| Stage 2 | - | - | - | - | - | - | 379 | 391 | - | 411 | 424 | - |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.318 |
| Pot Cap-1 Maneuver | 1245 | - | - | 1265 | - | - | 319 | 327 | 778 | 314 | 322 | 749 |
| Stage 1 | - | - | - | - | - | - | 635 | 608 | - | 653 | 623 | - |
| Stage 2 | - | - | - | - | - | - | 643 | 607 | - | 618 | 587 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1245 | - | - | 1265 | - | - | 283 | 295 | 778 | 268 | 291 | 749 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 283 | 295 | - | 268 | 291 | - |
| Stage 1 | - | - | - | - | - | - | 596 | 570 | - | 613 | 600 | - |
| Stage 2 | - | - | - | - | - | - | 596 | 585 | - | 543 | 551 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 1.4 | 0.8 | 19.9 | 13.5 |
| HCM LOS | | | C | B |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 340 | 1245 | - | - | 1265 | - | - | 455 |
| HCM Lane V/C Ratio | 0.29 | 0.051 | - | - | 0.03 | - | - | 0.071 |
| HCM Control Delay (s) | 19.9 | 8 | 0 | - | 7.9 | 0 | - | 13.5 |
| HCM Lane LOS | C | A | A | - | A | A | - | B |
| HCM 95th %tile Q(veh) | 1.2 | 0.2 | - | - | 0.1 | - | - | 0.2 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 2.8 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Vol, veh/h | 58 | 242 | 34 | 20 | 145 | 39 | 18 | 15 | 15 | 5 | 5 | 12 |
| Future Vol, veh/h | 58 | 242 | 34 | 20 | 145 | 39 | 18 | 15 | 15 | 5 | 5 | 12 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 73 | 303 | 43 | 25 | 181 | 49 | 23 | 19 | 19 | 6 | 6 | 15 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 230 | 0 | 0 | 346 | 0 | 0 | 737 | 751 | 325 | 746 | 748 | 206 |
| Stage 1 | - | - | - | - | - | - | 471 | 471 | - | 256 | 256 | - |
| Stage 2 | - | - | - | - | - | - | 266 | 280 | - | 490 | 492 | - |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.318 |
| Pot Cap-1 Maneuver | 1338 | - | - | 1213 | - | - | 334 | 340 | 716 | 330 | 341 | 835 |
| Stage 1 | - | - | - | - | - | - | 573 | 560 | - | 749 | 696 | - |
| Stage 2 | - | - | - | - | - | - | 739 | 679 | - | 560 | 548 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1338 | - | - | 1213 | - | - | 301 | 309 | 716 | 285 | 310 | 835 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 301 | 309 | - | 285 | 310 | - |
| Stage 1 | - | - | - | - | - | - | 534 | 522 | - | 698 | 679 | - |
| Stage 2 | - | - | - | - | - | - | 702 | 663 | - | 490 | 511 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 1.4 | 0.8 | 16.6 | 13.4 |
| HCM LOS | | | C | B |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 371 | 1338 | - | - | 1213 | - | - | 458 |
| HCM Lane V/C Ratio | 0.162 | 0.054 | - | - | 0.021 | - | - | 0.06 |
| HCM Control Delay (s) | 16.6 | 7.8 | 0 | - | 8 | 0 | - | 13.4 |
| HCM Lane LOS | C | A | A | - | A | A | - | B |
| HCM 95th %tile Q(veh) | 0.6 | 0.2 | - | - | 0.1 | - | - | 0.2 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.1 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 6 | 96 | 153 | 3 | 10 | 17 |
| Future Vol, veh/h | 6 | 96 | 153 | 3 | 10 | 17 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 0 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 7 | 104 | 166 | 3 | 11 | 18 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 169 | 0 | - | 0 | 286 | 168 |
| Stage 1 | - | - | - | - | 168 | - |
| Stage 2 | - | - | - | - | 118 | - |
| Critical Hdwy | 4.12 | - | - | - | 6.42 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.42 | - |
| Follow-up Hdwy | 2.218 | - | - | - | 3.518 | 3.318 |
| Pot Cap-1 Maneuver | 1409 | - | - | - | 704 | 876 |
| Stage 1 | - | - | - | - | 862 | - |
| Stage 2 | - | - | - | - | 907 | - |
| Platoon blocked, % | | | - | - | - | |
| Mov Cap-1 Maneuver | 1409 | - | - | - | 700 | 876 |
| Mov Cap-2 Maneuver | - | - | - | - | 700 | - |
| Stage 1 | - | - | - | - | 858 | - |
| Stage 2 | - | - | - | - | 907 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s | 0.4 | 0 | 9.7 |
| HCM LOS | | | A |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1409 | - | - | - | 801 |
| HCM Lane V/C Ratio | 0.005 | - | - | - | 0.037 |
| HCM Control Delay (s) | 7.6 | 0 | - | - | 9.7 |
| HCM Lane LOS | A | A | - | - | A |
| HCM 95th %tile Q(veh) | 0 | - | - | - | 0.1 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 1 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 18 | 138 | 113 | 12 | 6 | 11 |
| Future Vol, veh/h | 18 | 138 | 113 | 12 | 6 | 11 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 0 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 20 | 150 | 123 | 13 | 7 | 12 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 136 | 0 | - | 0 | 320 | 130 |
| Stage 1 | - | - | - | - | 130 | - |
| Stage 2 | - | - | - | - | 190 | - |
| Critical Hdwy | 4.12 | - | - | - | 6.42 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.42 | - |
| Follow-up Hdwy | 2.218 | - | - | - | 3.518 | 3.318 |
| Pot Cap-1 Maneuver | 1448 | - | - | - | 673 | 920 |
| Stage 1 | - | - | - | - | 896 | - |
| Stage 2 | - | - | - | - | 842 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 1448 | - | - | - | 663 | 920 |
| Mov Cap-2 Maneuver | - | - | - | - | 663 | - |
| Stage 1 | - | - | - | - | 883 | - |
| Stage 2 | - | - | - | - | 842 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s | 0.9 | 0 | 9.6 |
| HCM LOS | | | A |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1448 | - | - | - | 809 |
| HCM Lane V/C Ratio | 0.014 | - | - | - | 0.023 |
| HCM Control Delay (s) | 7.5 | 0 | - | - | 9.6 |
| HCM Lane LOS | A | A | - | - | A |
| HCM 95th %tile Q(veh) | 0 | - | - | - | 0.1 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 8.2 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 5 | 96 | 8 | 5 | 167 | 5 | 7 | 4 | 4 | 3 | 4 | 13 |
| Future Vol, veh/h | 5 | 96 | 8 | 5 | 167 | 5 | 7 | 4 | 4 | 3 | 4 | 13 |
| Peak Hour Factor | 0.81 | 0.81 | 0.81 | 0.87 | 0.87 | 0.87 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 6 | 119 | 10 | 6 | 192 | 6 | 9 | 5 | 5 | 4 | 5 | 17 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay | 8 | 8.4 | 7.8 | 7.5 |
| HCM LOS | A | A | A | A |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 47% | 5% | 3% | 15% |
| Vol Thru, % | 27% | 88% | 94% | 20% |
| Vol Right, % | 27% | 7% | 3% | 65% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 15 | 109 | 177 | 20 |
| LT Vol | 7 | 5 | 5 | 3 |
| Through Vol | 4 | 96 | 167 | 4 |
| RT Vol | 4 | 8 | 5 | 13 |
| Lane Flow Rate | 20 | 135 | 203 | 27 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.026 | 0.155 | 0.232 | 0.032 |
| Departure Headway (Hd) | 4.633 | 4.135 | 4.107 | 4.331 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 777 | 857 | 867 | 831 |
| Service Time | 2.634 | 2.211 | 2.169 | 2.332 |
| HCM Lane V/C Ratio | 0.026 | 0.158 | 0.234 | 0.032 |
| HCM Control Delay | 7.8 | 8 | 8.4 | 7.5 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0.1 | 0.5 | 0.9 | 0.1 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 8.2 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 10 | 138 | 12 | 6 | 112 | 11 | 7 | 9 | 9 | 3 | 4 | 13 |
| Future Vol, veh/h | 10 | 138 | 12 | 6 | 112 | 11 | 7 | 9 | 9 | 3 | 4 | 13 |
| Peak Hour Factor | 0.81 | 0.81 | 0.81 | 0.87 | 0.87 | 0.87 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 12 | 170 | 15 | 7 | 129 | 13 | 9 | 12 | 12 | 4 | 5 | 17 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay | 8.4 | 8.1 | 7.8 | 7.5 |
| HCM LOS | A | A | A | A |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 28% | 6% | 5% | 15% |
| Vol Thru, % | 36% | 86% | 87% | 20% |
| Vol Right, % | 36% | 7% | 9% | 65% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 25 | 160 | 129 | 20 |
| LT Vol | 7 | 10 | 6 | 3 |
| Through Vol | 9 | 138 | 112 | 4 |
| RT Vol | 9 | 12 | 11 | 13 |
| Lane Flow Rate | 33 | 198 | 148 | 27 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.042 | 0.226 | 0.171 | 0.032 |
| Departure Headway (Hd) | 4.557 | 4.12 | 4.148 | 4.366 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 790 | 861 | 853 | 825 |
| Service Time | 2.558 | 2.194 | 2.232 | 2.367 |
| HCM Lane V/C Ratio | 0.042 | 0.23 | 0.174 | 0.033 |
| HCM Control Delay | 7.8 | 8.4 | 8.1 | 7.5 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0.1 | 0.9 | 0.6 | 0.1 |

# PRELIMINARY GEOTECHNICAL ENGINEERING REPORT

## PROPOSED MULTI-FAMILY RESIDENTIAL DEVELOPMENT
## PARCEL A – COYOTE CREEK SUBDIVISION
## 4TH STREET AND WAGONWHEEL DRIVE
## FORT LUPTON, COLORADO

**TERRACON PROJECT NO. 25025241**
**October 31, 2002**

*Prepared for:*

**Matrix Funding Corporation**
**c/o Cimarron Consultants, Inc.**
**6551 South Revere Parkway, Suite 265**
**Englewood, Colorado 80111**

**Attn: Mr. Karl Kasch**

*Prepared by:*

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**Wheat Ridge, Colorado 80033**
**Phone: 303-423-3300**
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Terracon

October 31, 2002

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Matrix Funding Corporation
c/o Cimarron Consultants, Inc.
6551 South Revere Parkway, Suite 265
Englewood, Colorado 80111

Attn: Mr. Karl Kasch

**Re: Preliminary Geotechnical Engineering Report**
**Proposed Multi-Family Residential Development**
**Parcel A – Coyote Creek Subdivision**
**4th Street and Wagonwheel Drive**
**Fort Lupton, Colorado**
**Terracon Project No. 25025241**

Terracon has completed preliminary geotechnical engineering exploration for the proposed multi-family residential development to be located near the northwest corner of 4th Street and Wagonwheel Drive in Fort Lupton, Colorado. This study was performed in general accordance with our Proposal Number 2502420 dated July 17, 2002.

The results of our engineering study, including the Boring Location Map, laboratory test results, Logs of Borings, and the preliminary geotechnical recommendations needed to aid in the design and construction of foundations and other earth connected phases of this project are attached.

The subsurface soils at the site consisted of native materials comprised of sands with varying amounts of silt, clay and gravel, clays with varying amounts of sand, and silt with varying amounts of sand extending to depths of about 3 to 14-1/2 feet below existing site grade. Claystone and/or sandstone bedrock was encountered beneath the native soils and extended to the full depth of exploration. The information obtained by geologic survey and the results of field exploration and laboratory testing completed for this study indicate that the sand and silt soils, and sandstone bedrock are generally considered to be non- to low expansive. The clay soils have a low to moderate expansive potential. The claystone bedrock should be considered to be moderately to very highly expansive. The soils and bedrock at anticipated foundation bearing depth have a low to high load bearing capability.

Based on the geotechnical engineering analyses, subsurface exploration and laboratory test results, we recommend that the proposed buildings be supported on a grade beam and drilled pier or spread footing foundation systems. Drilled pier foundation systems will generally be required in areas where potentially expansive claystone bedrock is encountered at relatively shallow depths. If basement construction is not incorporated into the design of the structures, consideration could be given to supporting the proposed

buildings on post-tensioned slab foundation systems. However, if potentially highly to very highly expansive claystone bedrock is encountered at or near slab bearing elevation, consideration should be given to partial removal of these materials, moisture conditioning and recompaction and/or replacement with non- to low expansive on-site or imported soils.

Slab-on-grade associated with the spread footing and drilled pier foundation options is considered acceptable when bearing on non- to low expansive soils provided that care is taken in the placement and compaction of the subgrade materials and that some movement can be tolerated. However, given the engineering characteristics of near surface expansive clays or claystone bedrock which may be encountered at or near floor slab bearing elevations, consideration should be given to partial removal of these materials, and replacement with non- to low expansive on-site or imported soils. If little or no movement can be tolerated, consideration should be given to the use of structural floor systems

Shallow groundwater conditions within some portions of the site will require particular attention in the design and construction.

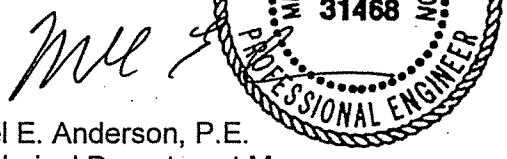
Other design and construction recommendations, based upon geotechnical conditions, are presented in the report.

Supplementary geotechnical engineering exploration should be performed at the site when final design plans become available and preliminary design studies are complete. Supplemental geotechnical explorations will be used to confirm or modify the recommendations contained in this preliminary report.

We appreciate being of service to you in the geotechnical engineering phase of this project, and are prepared to assist you during the construction phases as well. If you have any questions concerning this report or any of our testing, inspection, design and consulting services, please do not hesitate to contact us.

Sincerely,
TERRACON

Mohammed H. Abusalih, E.I.T.
Staff Engineer




Michael E. Anderson, P.E.
Geotechnical Department Manager

Copies to: Addressee (5)

## TABLE OF CONTENTS

Page No.

Letter of Transmittal ..... ii

**INTRODUCTION** ..... 1
**PROPOSED CONSTRUCTION** ..... 1
**SITE EXPLORATION** ..... 2
Field Exploration ..... 2
Laboratory Testing ..... 3
**SITE CONDITIONS** ..... 3
**SUBSURFACE CONDITIONS** ..... 4
Geology ..... 4
Soil and Bedrock Conditions ..... 4
Field and Laboratory Test Results ..... 4
Groundwater Conditions ..... 5
**ENGINEERING ANALYSES AND PRELIMINARY RECOMMENDATIONS** ..... 6
Geotechnical Considerations ..... 6
Foundation Systems ..... 7
Drilled Straight Shaft Piers ..... 7
Spread Footings ..... 8
Post-Tensioned Slabs ..... 9
Basement Construction ..... 10
Lateral Earth Pressures ..... 11
Seismic Considerations ..... 12
Floor Slab Design and Construction ..... 12
Non- to Low Expansive Materials ..... 12
Moderately to Very Highly Expansive Materials ..... 13
Preliminary Pavement Design and Construction ..... 13
Borrow Fill Materials ..... 15
Earthwork ..... 16
General Considerations ..... 16
Site Preparation ..... 16
Subgrade Preparation ..... 17
Fill Materials and Placement ..... 17
Shrinkage ..... 18
Slopes ..... 18
Excavation and Trench Construction ..... 19

## TABLE OF CONTENTS (Cont'd)

Page No.

Additional Design and Construction Considerations ..... 19
Exterior Slab Design and Construction ..... 19
Underground Utility Systems ..... 20
Corrosion Protection ..... 20
Surface Drainage ..... 21
GENERAL COMMENTS ..... 21

Figure No.

BORING LOCATION MAP ..... 1

APPENDIX A: LOGS OF BORINGS

APPENDIX B: LABORATORY TEST RESULTS

APPENDIX C: GENERAL NOTES

# PRELIMINARY GEOTECHNICAL ENGINEERING REPORT

## PROPOSED MULTI-FAMILY RESIDENTIAL DEVELOPMENT
## PARCEL A – COYOTE CREEK SUBDIVISION
## 4TH STREET AND WAGONWHEEL DRIVE
## FORT LUPTON, COLORADO

**TERRACON PROJECT NO. 25025241**
**October 31, 2002**

## INTRODUCTION

This report contains the results of our preliminary geotechnical engineering exploration for the proposed multi-family residential development to be located near the northwest corner of 4th Street and Wagonwheel Drive in Fort Lupton, Colorado.

The purpose of these services is to provide information and preliminary geotechnical engineering recommendations relative to:

- subsurface soil and bedrock conditions;
- groundwater conditions;
- foundation design and construction;
- basement construction;
- lateral earth pressures;
- floor slab design and construction;
- pavement design and construction;
- earthwork; and
- drainage.

The preliminary recommendations contained in this report are based upon the results of field and laboratory testing, engineering analyses, and experience with similar soil conditions, structures and our understanding of the proposed project.

## PROPOSED CONSTRUCTION

As we understand, the project will consist of the development of an approximate 15-acre parcel. Development will be for multi-family residential purposes. A total of 160 residential units are planned. We assume that the residences will consist of one to three-story wood frame structures supported on reinforced concrete foundation systems. We also understand that basement construction may be incorporated into the design of the buildings.

Other major site development, will include the construction of asphalt concrete or Portland cement concrete paved drives and parking areas, along with the installation of underground utilities.

Preliminary grading plans were available prior to the preparation of this report. Maximum fill and cut depths are anticipated to be on the order of about 1 to 4 feet. Generally, cut operations are anticipated within the north and northeastern portions of the site. It is our understanding that the materials derived from cut areas may be transported and used as roadway subgrade materials along Mountain View Avenue, if they meet the requirements outlined in the previous geotechnical engineering report for pavement thickness design for Filing No. 5 of Coyote Creek Subdivision, Terracon Project No. 25025217 dated September 25, 2002.

## SITE EXPLORATION

The scope of the services performed for this project included site reconnaissance by a field engineer, a subsurface exploration program, laboratory testing and engineering analysis.

**Field Exploration:** A total of 10 test borings were drilled on October 10, 2002 to depths of about 20 to 25 feet below existing site grade at the approximate locations shown on the Boring Location Map, Figure 1. Six borings were located throughout the site, with the remaining four borings drilled within the northeast portion of the site where cut operations are planned. All borings were advanced with a truck-mounted drilling rig, utilizing 4-inch diameter solid stem auger.

The borings were located in the field by pacing from property lines and/or existing site features. Elevations were taken at each boring location by interpolation from contours indicated on the provided Site Plan prepared by Merrick Engineering and Architects. The accuracy of boring locations and elevations should only be assumed to the level implied by the methods used.

Lithologic logs of each boring were recorded by the field engineer during the drilling operations. At selected intervals, samples of the subsurface materials were taken by driving ring barrel samplers. Representative bulk samples of subsurface materials were obtained from the borings located within the planned cut areas of the site.

Penetration resistance measurements were obtained by driving the ring barrel into the subsurface materials with a 140-pound hammer falling 30 inches. The penetration resistance value is a useful index to the consistency, relative density or hardness of the materials encountered.

Groundwater measurements were made in each boring at the time of site exploration and several days after drilling.

**Laboratory Testing:** All samples retrieved during the field exploration were returned to the laboratory for observation by the project geotechnical engineer, and were classified in accordance with the Unified Soil Classification System described in Appendix C. Samples of bedrock were classified in accordance with the general notes for Rock Classification. At that time, an applicable laboratory testing program was formulated to determine engineering properties of the subsurface materials. Following the completion of laboratory testing, the field descriptions were confirmed or modified as necessary and Logs of Borings were prepared and are presented in Appendix A.

Laboratory test results are presented in Appendix B, and were used for the geotechnical engineering analyses, and the development of preliminary foundation and earthwork recommendations. All laboratory tests were performed in general accordance with the applicable ASTM, local or other accepted standards.

Selected soil and bedrock samples were tested for the following engineering properties:

- Water content
- Dry density
- Consolidation
- Expansion
- Grain size
- Plasticity Index
- Water soluble sulfate content

## SITE CONDITIONS

The site was vacant at the time of field exploration and to our knowledge had not been previously developed. The site was bounded on the north by Twombly Elementary School, on the east and south by Coyote Creek Golf Course, and on the west by an existing irrigation ditch. The ground surface was generally flat with an estimated elevation differential of about 17 to 20 feet across the entire parcel. Vegetation consisted of a sparse growth of native grass and brush cover. Site drainage was generally in the form of sheet surface flow directed to the west and southwest. An unlined irrigation ditch, about 25 feet wide and about 4 to 6 feet deep, was observed along the western property line of the site. Evidence of potential underground utilities was observed within the northern and central portions of the site.

## SUBSURFACE CONDITIONS

**Geology:** Surficial geologic conditions at the site, as mapped by the U.S. Geological Survey (USGS) ([1]Soister, 1965), consist of alluvial sand and silt deposits of Pleistocene Age. These materials are described as grayish-yellow to grayish-orange sand and silt with some clay, scattered pebbles and gravel lenses. These materials are on the order of about 25 to 30 feet in thickness.

Bedrock underlying the surface units consists of the Dawson Formation of Cretaceous Age. This formation is mostly comprised of dark gray shale and clay with some yellowish-gray siltstone and partly limonitic arkosic sandstone; ironstone concentrations as much as 4 feet in diameter, especially in the lower part; and rare lenticular coal beds less than 3 feet thick. Thickness has been reported to be on the order of about 550 to 600 feet.

Due to the gently sloping nature of the site, geologic hazards at the site are anticipated to be low. Seismic activity in the area is anticipated to be low; and from a structural standpoint, the property should be relatively stable. With proper site grading around the proposed structures, erosional problems at the site should be reduced.

Mapping completed by the Colorado Geological Survey ([2]Hart, 1972), indicates the site is in an area of "Windblown sand or silt " with areas of "Low Swell Potential" adjacent to the site. This material has been described as having low swell potential and may be subject to severe settlement or collapse when water is allowed to saturate the deposits. Bedrock with higher swell potential may be locally less than 10 feet below the ground surface.

**Soil and Bedrock Conditions:** As presented on the Logs of Boring, surface soils to depths of 3 to 14-1/2 feet below existing site grade consisted of native materials comprised of sands with varying amounts of silt, clay and gravel, clays with varying amounts of sand and silts with varying amounts of sand. Claystone and/or sandstone was encountered beneath the native soils and extended to the full depth of exploration.

**Field and Laboratory Test Results:** Field test results indicate that the clay soils vary from stiff to very stiff in consistency. The sand and silt soils vary from loose to medium dense in relative density. The claystone and sandstone bedrock varied from weathered to very hard in hardness.

---

[1]Soister, Paul E., 1965, ***Geologic Map of the Fort Lupton Quadrangle, Colorado***, United States Geological Survey, Map GQ-397.

[2]Hart, Stephen S., 1972, ***Potentially Swelling Soil and Rock in the Boulder-Fort Collins-Greeley Area, Front Range-Urban Corridor Colorado***, Colorado Geological Survey, Sheet 1 of 4.

Laboratory test results indicate clay soils have a low to moderate expansive potential. The sand and silt soils, and sandstone bedrock are generally considered to be non- to low expansive. The claystone bedrock should be considered to be moderately to very highly expansive. Results of water soluble sulfate indicated values ranging from 0 to 410 mg/L.

Laboratory classification testing was performed on the subsurface soils obtained from Boring Nos. 7 through 10 where cut operations are anticipated to be performed. Following is a summary of the laboratory classification testing:

| **Boring No.** (Sample Depth) | **USCS Classification** | **AASHTO Classification** |
|---|---|---|
| **7** (0-7') | SM | A-2-4 (0) |
| **8** (0-3-1/2') | CL | A-4 (1) |
| **9** (0-4') | SC | A-6 (2) |
| **10** @ 2' | ML | A-4 (0) |
| **10** @ 4' | SM | A-2-4 (0) |

**Groundwater Conditions:** Groundwater was encountered at depths of about 5 to 22-1/2 feet below existing site grade in the majority of the borings at the time of field exploration. Groundwater was not observed in Boring Nos. 2, 8, and 10. When checked several days after drilling, groundwater was measured in the majority of the borings at depths of about 7 to 12 feet below existing site grade. However, Boring Nos. 2 and 10 had caved-in under dry conditions at depths of about 4 and 23 feet below existing site grade. Additionally, groundwater was not observed in Boring No. 8 when checked several days after drilling. These observations represent groundwater conditions at the time of the field exploration, and may not be indicative of other times or at other locations. Groundwater levels can be expected to fluctuate with varying seasonal and weather conditions.

Based upon review of U.S. Geological Survey Maps ([3]Hillier, et al, 1979), regional groundwater beneath the project area predominates in colluvial, landslide or windblown materials, or in fractured weathered consolidated sedimentary bedrock located at a depth near ground surface. Seasonal variations in groundwater conditions are expected since the aquifer materials may not be perennially saturated. Groundwater is generally encountered at depths ranging from 5 to 20 feet below ground surface; depth to seasonal groundwater is generally 10 feet or less.

Zones of perched and/or trapped groundwater may also occur at times in the subsurface soils overlying bedrock, on top of the bedrock surface or within permeable fractures in the

[3]Hillier, Donald E. and Schneider, Paul A., Jr., 1979, ***Depth to Water Table (1976-1977) in the Boulder-Fort Collins-Greeley Area, Colorado***, United States Geological Survey, Map I-855-I.

bedrock materials. The location and amount of perched water is dependent upon several factors, including hydrologic conditions, type of site development, irrigation demands on or adjacent to the site, fluctuations in water features, seasonal and weather conditions.

Fluctuations in groundwater levels can best be determined by implementation of a groundwater-monitoring plan. Such a plan would include installation of groundwater-monitoring wells, and periodic measurement of groundwater levels over a sufficient period of time.

The possibility of groundwater fluctuations should be considered when developing design and construction plans for the project.

## ENGINEERING ANALYSES AND PRELIMINARY RECOMMENDATIONS

The preliminary recommendations presented in this report are based on the assumption that the subsurface conditions do not deviate appreciably from those encountered in the borings. Supplementary geotechnical engineering exploration should be performed at the site upon completion of initial design studies. Supplemental geotechnical explorations will be used to confirm or modify the recommendations contained in this preliminary report.

**Geotechnical Considerations:** The site appears suitable for the proposed construction. Potentially moderately to very highly expansive claystone bedrock along with shallow groundwater conditions encountered at relatively shallow depths within some portions of the site will require particular attention in the design and construction.

Potentially moderately to very highly expansive claystone bedrock was encountered at relatively shallow depths within the majority of the site. Foundation systems and floor slabs designed to mitigate the expansive potential of the claystone bedrock may have to be incorporated in these areas. Additionally, shallow groundwater conditions were encountered within some portions of the site. Significant cuts may have to be limited or fill may have to be placed in these areas to reduce the effects of shallow groundwater conditions on full basement construction, if utilized. If basements are utilized, a minimum separation distance of about 4 to 6 feet should be maintained between foundations and groundwater levels.

Preliminary grading plans were available prior to the preparation of this report. Generally, maximum cut and fill depths on the order of about 1 to 4 feet are anticipated. The majority of the deep cut operations appear to be within the northern and northeastern portions of the site.

Based on the geotechnical engineering analyses, subsurface exploration and laboratory test results, we recommend that the proposed buildings could be supported on a grade beam and drilled pier or spread footing foundation systems. Drilled pier foundation systems will generally be required in areas where potentially expansive claystone bedrock is encountered at relatively shallow depths. If basement construction is not incorporated into the design of the structures, consideration could be given to supporting the proposed buildings on post-tensioned slab foundation systems. However, if potentially highly to very highly expansive claystone bedrock is encountered at or near slab bearing elevation, consideration should be given to partial removal of these materials to depths of about 3 to 5 feet, moisture conditioning and recompaction and/or replacement with non- to low expansive on-site or imported soils.

Slab-on-grade associated with the spread footing and drilled pier foundation options is considered acceptable when bearing on non- to low expansive soils provided that care is taken in the placement and compaction of the subgrade materials and that some movement can be tolerated. However, given the engineering characteristics of near surface expansive clays and claystone bedrock which may be encountered at or near floor slab bearing elevations, consideration should be given to partial removal of these materials to depths of about 3 to 5 feet, and replacement with non- to low expansive on-site or imported soils. If little or no movement can be tolerated, consideration should be given to the use of structural floor systems

Preliminary design and construction recommendations for foundation systems and other earth connected phases of the project are outlined below.

**Foundation Systems:**

**Drilled Straight Shaft Piers:** Due to the potential presence of moderately to very highly expansive claystone bedrock at relatively shallow depths within the majority of the site, a grade beam and drilled pier foundation system is considered applicable for support of the proposed structures. Straight shaft piers, drilled a minimum of 8 to 10 feet into medium hard or harder bedrock, with a minimum shaft length of 20 to 25 feet can be used for preliminary design purposes.

For axial compression loads, piers may be preliminarily designed for maximum end-bearing pressures ranging from 20,000 to 30,000 pounds per square foot (psf), and skin friction values ranging from 2,000 to 3,000 psf for the portion of the pier in medium hard or harder bedrock.

To reduce potential uplift forces on piers, small diameter piers and long grade beam spans, which increase individual pier loading, are recommended. A void space should be provided beneath grade beams, between piers. The void material should be of suitable strength to support the weight of fresh concrete used in grade beam construction and to avoid collapse when foundation backfill is placed.

Drilling to design depths should be possible with conventional single flight power augers. Groundwater conditions and caving soils across the site indicate that temporary steel casing will likely be required in some areas to properly drill and clean piers prior to concrete placement. Groundwater should be removed from each pier hole prior to concrete placement. Pier concrete should be placed immediately after completion of drilling and cleaning. If pier concrete cannot be placed in dry conditions, a tremie should be used for concrete placement. Due to potential sloughing and raveling, foundation concrete quantities may exceed calculated geometric volumes.

If casing is used for pier construction, it should be withdrawn in a slow continuous manner maintaining a sufficient head of concrete to prevent infiltration of water or the creation of voids in pier concrete. Pier concrete should have a relatively high fluidity when placed in cased pier holes or through a tremie.

**Spread Footings:** Due to the presence of non- to low expansive soils within some portions of the site, spread footing foundations bearing upon undisturbed non- to low expansive native soils or sandstone bedrock, recompacted native soils, and/or engineered fill are recommended for support of some of the proposed buildings. Additionally, a minimum separation distance of about 5 to 7 feet should be maintained between spread footings and potentially expansive claystone bedrock.

The footings may be designed for maximum bearing pressures ranging from about 1,500 to 2,500 psf. In addition, the footings may need to be sized to maintain minimum dead load pressures of about 500 to 800 psf. The design bearing pressure applies to dead loads plus design live load conditions. The design bearing pressures may be increased by one-third when considering total loads that include wind or seismic conditions.

Exterior footings should be placed a minimum of 36 inches below finished grade for frost protection and to provide confinement for the bearing soils. Interior footings should bear a minimum of 12 inches below finished grade. Finished grade is the lowest adjacent grade for perimeter footings and floor level for interior footings.

Footings should be proportioned to minimize differential foundation movement. Proportioning on the basis of equal total movement is recommended; however,

proportioning to relative constant dead load pressure will also reduce differential movement between adjacent footings. Total movement resulting from the assumed structural loads is estimated to be on the order of about 1 inch. Proper drainage should be provided in the preliminary design and during construction to reduce the settlement potential.

Areas of low density soils may be encountered at foundation bearing depth. When such conditions exist beneath planned footing areas, the subgrade soils should be removed and replaced as engineered fill.

**Post-Tensioned Slabs:** Post-tensioned slab construction can be considered as an alternate foundation system for support of the proposed buildings if basement construction is not incorporated into the design. However, potentially moderately to very highly expansive claystone bedrock encountered at or within foundation bearing elevation will require modification prior to slab construction. Modification would consist of partial removal of these materials to depths of about 3 to 5 feet, moisture conditioning and recompaction and/or replacement with non- to low on-site or imported soils. Post-tensioned slabs should be designed using criteria outlined by the Post-Tensioning Institute[4] based on the following:

- Maximum Allowable Bearing Pressure.....1,500 to 2,500 psf

- Edge Moisture Variation Distance, $e_m$
  - Center Lift Condition .....5.5 feet
  - Edge Lift Condition.....2.5 feet

- Estimated Maximum Settlement (sands or sandstone) ..... 1 inch
- Estimated Differential Settlement (sands or sandstone).....½ to 1 inch

- Differential Soil Movement, $y_m$
  - Center Lift Condition (clays and claystone) .....2 to 4 inches
  - Edge Lift Condition (clays and claystone) .....½ to 1-1/2 inches

- Slab-Subgrade friction coefficient, $\mu$
  - on polyethylene sheeting .....0.75
  - on cohesionless soils.....1.00
  - on cohesive soils.....2.00

[4] _____, (1996), ***Design and Construction of Post-Tensioned Slabs-on-Ground***, Post-Tensioning Institute, Second Edition.

Post-tensioned slabs, thickened or turndown edges and/or interior beams should be designed and constructed in accordance with the requirements of the Post-Tensioning Institute and the American Concrete Institute.

The above outlined differential soil movement values should also be considered as the potential amounts for tilting of the structures, which could be caused by non-uniform and significant wetting of the subsurface materials below the foundation, resulting in potential differential movements.

Exterior slab edges should be placed a minimum of 36 inches below finished grade for frost protection. Finished grade is the lowest adjacent grade for perimeter beams.

Masonry walls should be reinforced as necessary to reduce the potential for distress caused by differential foundation movement. The use of joints at openings or other discontinuities in masonry walls is recommended.

**Basement Construction:** Groundwater was encountered at depths of about 5 to 22-1/2 feet below existing site grade in the majority of the borings at the time of field exploration. However, groundwater was not encountered in Boring Nos. 2, 8 and 10 at the time of field exploration. When checked several days after drilling, groundwater was measured at depths of about 7 to 12 feet below existing site grade in some of the borings. However, groundwater was not observed in Boring 8, and dry caving had occurred in Boring Nos. 2 and 10 when checked several days after drilling. Therefore, full-depth basement construction is considered acceptable on the site provided that a minimum separation of 4 to 6 feet can be maintained between the bottom of the lowest foundation element and groundwater levels. Fill material should be placed or cut depths should be minimized in areas of shallow groundwater. If the site is not raised or cut depths are not limited, interceptor drains or underdrains will likely be required to mitigate groundwater conditions for basement construction.

Perched groundwater may occur at times since the subsurface soils are relatively impermeable and tend to trap water. Completion of site development, including installation of landscaping and irrigation systems, will likely lead to perched groundwater development.

To reduce the potential for perched groundwater to impact foundation bearing soils and enter the basement of the structure, installation of a perimeter drainage system is recommended. The drainage system should be constructed around the interior or exterior perimeter of the basement foundation, and sloped at a minimum 1/8 inch per foot to a suitable outlet, such as a sump and pump system.

**Lateral Earth Pressures:** For soils above any free water surface, recommended equivalent fluid pressures for unrestrained foundation elements are:

- Active:
  Cohesive soil backfill (on-site clay or silt)..... 50 to 55 psf/ft
  Cohesionless soil backfill (on-site sand, processed sandstone or imported soil) ..... 35 to 45 psf/ft
  Undisturbed subsoil..... 35 to 40 psf/ft
  On-site claystone bedrock materials.....not recommended for use

- Passive:
  Cohesive soil backfill (on-site clay or silt)..... 250 to 300 psf/ft
  Cohesionless soil backfill (on-site sand, processed sandstone or imported soil)..... 300 to 350 psf/ft
  Shallow grade beam and foundation walls..... 250 to 350 psf/ft
  Drilled Piers..... 400 to 500 psf/ft
  Undisturbed soils or bedrock ..... 400 to 500 psf/ft

- Coefficient of base friction ..... 0.35 to 0.40
- Adhesion at the base of footings ..... 500 to 750 psf

Where the design includes restrained elements, the following equivalent fluid pressures are recommended:

- At rest:
  Cohesive soil backfill (on-site clay or silt)..... 60 to 65 psf/ft
  Cohesionless soil backfill (on-site sand, processed sandstone or imported soil) ..... 50 to 60 psf/ft
  Undisturbed subsoil..... 60 to 70 psf/ft
  On-site claystone bedrock materials.....not recommended for use

The lateral earth pressures herein do not include any factor of safety and are not applicable for submerged soils/hydrostatic loading. Additional recommendations may be necessary if submerged conditions are to be included in the design.

Fill against grade beams, basement walls, and foundations should be well compacted. Compaction of each lift adjacent to walls should be accomplished with hand-operated tampers or other lightweight compactors. Claystone bedrock is not recommended as backfill materials for foundation and basement walls. Overcompaction may cause excessive lateral earth pressures which could result in wall movement.

**Seismic Considerations:** The project site is located in Seismic Risk Zone I of the Seismic Zone Map of the United States as indicated by the 1997 Uniform Building Code. Based upon the nature of the subsurface materials, Soil Profile Type "$S_C$" should be used for the design of structures for the proposed project (1997 Uniform Building Code, Table No. 16-J).

**Floor Slab Design and Construction:** The following recommendations are applicable with slabs-on-grade associated with the spread footing and drilled pier foundation options.

**Non- to Low Expansive Materials:** Due to the presence of non- to low expansive soils within some portions of the site, slab-on-grade construction is considered acceptable provided that care is taken in the placement and compaction of the subgrade soils and that some movement can be tolerated. Some differential movement of a slab-on-grade floor system is possible should these subgrade soils increase in moisture content. Movement on the order of about 1 to 2 inches is possible. Such movements are considered within general tolerance for normal slab-on-grade construction. To reduce any potential slab movements, the subgrade soils should be prepared as outlined in the "Earthwork" section of this report.

For preliminary structural design of concrete slabs-on-grade, a modulus of subgrade reaction of 100 pounds per cubic inch (pci) may be used for floors supported on existing or engineered fill consisting of on-site soils. A modulus of 200 pci may be used for floors supported on non-expansive imported fill meeting the specifications outlined below.

Additional floor slab design and construction recommendations for slabs supported on non- to low expansive soils are as follows:

- Positive separations and/or isolation joints should be provided between slabs and all foundations, columns or utility lines to allow independent movement.
- Contraction joints should be provided in slabs to control the location and extent of cracking.
- A minimum 1 to 2-inch void space should be constructed above, or below non-bearing partition walls placed on the floor slab. Special framing details should be provided at doorjambs and frames within partition walls to avoid potential distortion. Partition walls should be isolated from suspended ceilings.
- Interior trench backfill placed beneath slabs should be compacted in accordance with recommended specifications outlined below.

- If moisture sensitive floor coverings are used on interior slabs, consideration should be given to the use of barriers to minimize potential vapor rise through the slab.

- Floor slabs should not be constructed on frozen subgrade.

- Other design and construction considerations, as outlined in the ACI Design Manual, Section 302.1R are recommended.

**Moderately to Very Highly Expansive Materials:** Due to the potential presence of moderately to very highly expansive claystone bedrock at or near basement bearing elevations within the majority of the site, differential movement of floor slab-on-grade may occur should the claystone bedrock undergo changes in moisture content. Movement on the order of 2 to 3 inches or more is possible. A common practice to reduce potential slab heave involves overexcavation of the potentially expansive claystone bedrock materials encountered at or within slab bearing elevation to depths of about 3 to 5 feet, and replacement with non- to low on-site or imported soils. This alternative will not eliminate the possibility of slab heave; but movements should be reduced and tend to be more uniform. If little or no movement can be tolerated, consideration should be given to using structural floor systems.

**Preliminary Pavement Design and Construction:** Preliminary design of pavements for the project have been based on the procedures outlined in the 1993 "Guideline for Design of Pavement Structures" by the American Association of State Highway and Transportation Officials (AASHTO). As discussed, the design presented herein is for preliminary planning purposes for the project. For pavement areas located within City of Fort Lupton right-of-way, a pavement design report meeting the City of Fort Lupton specifications will be required.

Traffic criteria assumed for pavement thickness designs include single 18-kip equivalent single axle loads (ESAL's) of 36,500 for automobile parking, and 109,500 for drive lanes.

Based upon AASHTO criteria, Colorado is located within Climatic Region VI of the United States. This region is characterized as being dry, with hard ground freeze and spring thaw. The spring thaw condition typically results in saturated or near-saturated subgrade soil moisture conditions. The AASHTO criteria suggest that these moisture conditions are prevalent for approximately 12-½ percent of the annual moisture variation cycle.

Local drainage characteristics of proposed pavement areas are considered to vary from fair to good depending upon location on the site. For purposes of this preliminary design analysis, fair drainage characteristics are considered to control the design. These

characteristics, coupled with the approximate duration of saturated subgrade conditions, results in a design drainage coefficient of 1.0 when applying the AASHTO criteria for design.

For preliminary flexible pavement design, a terminal serviceability index of 2.0 was utilized along with an inherent reliability of 85 percent and a design life of 20 years. Using the correlated design R-value, appropriate ESAL, environmental criteria and other factors, the structural numbers (SN) of the pavement sections were determined on the basis of the 1993 AASHTO design equation.

In addition to the preliminary flexible pavement design analyses, a preliminary rigid pavement design analysis was completed, based upon AASHTO design procedures. Rigid pavement design is based on an evaluation of the Modulus of Subgrade Reaction of the soils (K-value), the Modulus of Rupture of the concrete, and other factors previously outlined. The preliminary design K-value for the subgrade soil was determined by correlation to the laboratory tests results. A modulus of rupture of 600 psi (working stress 450 psi) was used for pavement concrete. The rigid pavement thickness for each traffic category was determined on the basis of the AASHTO design equation.

Recommended alternatives for flexible and rigid pavements, summarized for each traffic area, are as follows:

| Traffic Area | Alternative | Recommended Pavement Thickness (Inches) | | | |
|---|---|---|---|---|---|
| | | Asphalt Concrete Surface | Aggregate Base Course | Portland Cement Concrete | Total |
| Automobile Parking | A | 6 | | | 6 |
| | B | 4 | 7 | | 11 |
| | C | | | 5* | 5* |
| Main Traffic Corridors | A | 7 | | | 7 |
| | B | 5 | 7 | | 12 |
| | C | | | 5* | 5* |

* Minimum pavement section thickness according to AASHTO

It should be noted that the above calculated sections were based on the correlated soil properties of the clay soils. Thinner sections are anticipated for pavements supported on sandy soils, as well as thicker sections for pavements supported on claystone bedrock. Additionally, swell mitigation may be required in areas where potentially expansive claystone bedrock is encountered at shallow depths.

A final pavement design should be completed subsequent to mass grading operations to confirm or modify the preliminary pavement thickness alternatives. The final design will account for variations in the pavement subgrade soils within paved areas and may have to meet the City of Fort Lupton or Weld County requirements. Accordingly, the actual thickness may vary from those outlined above.

Each alternative should be investigated with respect to current material availability and economic conditions. Rigid concrete pavement, a minimum of 6 inches in thickness, is recommended at the location of dumpsters where trash trucks park and load.

Aggregate base course (if used on the site) should consist of a blend of sand and gravel which meets strict specifications for quality and gradation. Use of materials meeting Colorado Department of Transportation (CDOT) Class 5 or 6 specifications is recommended for base course.

Aggregate base course should be placed in lifts not exceeding 6 inches and should be compacted to a minimum of 95 percent standard Proctor density (ASTM D698).

Where rigid pavements are used, materials meeting CDOT Class P specifications are recommended. Other specifications outlined by the City of Fort Lupton or Weld County should be followed.

The performance of all pavements can be enhanced by minimizing excess moisture which can reach the subgrade soils. The following preliminary recommendations should be considered at minimum:

- site grading at a minimum 2 percent grade away from the pavements;
- compaction of any utility trenches for landscaped areas to the same criteria as the pavement subgrade;
- sealing all landscaped areas in or adjacent to pavements to minimize or prevent moisture migration to subgrade soils;
- placing compacted backfill against the exterior side of curb and gutter; and,
- placing curb, gutter and/or sidewalk directly on subgrade soils without the use of base course materials.

**Borrow Fill Materials:** We understand materials derived from cut operations on the site may be used as subgrade materials for Mountain View Avenue within Filing No. 5 of the development if found to meet the specifications outlined in the referenced geotechnical engineering report. Based upon review of laboratory classification test results, it appears that the surface soils appear to be of the same or higher quality and meet the specifications

outlined in the referenced report. Therefore, it is our opinion that these materials could be used beneath pavements along Mountain View Boulevard.

**Earthwork:**

**General Considerations:** The following presents recommendations for site preparation, excavation, subgrade preparation and placement of engineered fills on the project.

All earthwork on the project should be observed and evaluated by Terracon. The evaluation of earthwork should include observation and testing of engineered fill, subgrade preparation, foundation bearing soils, and other geotechnical conditions exposed during the construction of the project.

**Site Preparation:** Strip and remove existing vegetation, debris, and other deleterious materials from proposed building and pavement areas. All exposed surfaces should be free of mounds and depressions which could prevent uniform compaction.

Stripped materials consisting of vegetation and organic materials should be wasted from the site, or used to revegetate landscaped areas or exposed slopes after completion of grading operations.

The site should be initially graded to create a relatively level surface to receive fill, and to provide for a relatively uniform thickness of fill beneath proposed building structures.

All exposed areas which will receive fill, once properly cleared, should be scarified to a minimum depth of 10 inches, conditioned to near optimum moisture content, and compacted.

Although evidence of fills or underground facilities such as septic tanks, cesspools, basements, and utilities was not observed during the site reconnaissance, such features could be encountered during construction. If unexpected fills or underground facilities are encountered, such features should be removed and the excavation thoroughly cleaned prior to backfill placement and/or construction.

It is anticipated that excavations for the proposed construction can be accomplished with conventional earthmoving equipment. If excavations need to penetrate into the bedrock, ripping or jack-hammering may be needed to advance the excavation.

Depending upon depth of excavation and seasonal conditions, groundwater may be encountered in excavations on the site. Pumping from sumps may be utilized to control

water within excavations. Well points may be required for significant groundwater flow, or where excavations penetrate groundwater to a significant depth.

Based upon the subsurface conditions determined from the geotechnical exploration, subgrade soils exposed during construction are anticipated to be relatively stable. However, the stability of the subgrade may be affected by precipitation, proximity to the existing irrigation ditch and golf course, proximity to existing groundwater conditions, repetitive construction traffic or other factors. If unstable conditions develop, workability may be improved by scarifying and drying. Overexcavation of wet zones and replacement with granular materials may be necessary. Use of lime, fly ash, kiln dust, cement or geotextiles could also be considered as a stabilization technique. Laboratory evaluation is recommended to determine the effect of chemical stabilization on subgrade soils prior to construction. Lightweight excavation equipment may be required to reduce subgrade pumping.

The individual contractor(s) is responsible for designing and constructing stable, temporary excavations as required to maintain stability of both the excavation sides and bottom. All excavations should be sloped or shored in the interest of safety following local and federal regulations, including current OSHA excavation and trench safety standards.

**Subgrade Preparation:** Subgrade soils beneath interior and exterior slabs, and beneath pavements should be scarified, moisture conditioned and compacted to a minimum depth of 12 inches. The moisture content and compaction of subgrade soils should be maintained until slab or pavement construction.

**Fill Materials and Placement:** Clean on-site soils or approved imported materials may be used as fill material.

Imported soils (if required) should conform to the following:

| **Gradation** | **Percent finer by weight (ASTM C136)** |
|---|---|
| 6" | 100 |
| 3" | 70-100 |
| No. 4 Sieve | 50-100 |
| No. 200 Sieve | 50 (max) |

- Liquid Limit ..... 30 (max)
- Plasticity Index ..... 15 (max)
- Maximum expansive potential (%)* ..... 1.5

*Measured on a sample compacted to approximately 95 percent of the ASTM D698 maximum dry density at about 3 percent below optimum water content. The sample is confined under a 100 psf surcharge and submerged.

Engineered fill should be placed and compacted in horizontal lifts, using equipment and procedures that will produce recommended moisture contents and densities throughout the lift. Engineered fill should be compacted to a minimum of 95 percent of the standard Proctor density test (ASTM D698).

On-site clay soils and processed claystone should be compacted within a moisture content range of optimum to 3 percent above optimum. On-site sands, processed sandstone and/or imported soils should be compacted within a moisture range of 3 percent below to 3 percent above optimum unless modified by the project geotechnical engineer.

**Shrinkage:** For balancing grading plans, estimated shrink or swell of soils and bedrock when used as compacted fill following recommendations in this report are as follows:

| Material | Estimated Shrink (-) Swell (+) Based on ASTM D698 |
|---|---|
| On-site soils: | |
| Clays and silts | +5 to -10% |
| Sands | -5 to -15% |
| On-site bedrock materials: | |
| Claystone | +5 to +10% |
| Sandstone | -5 to -10% |

**Slopes:** For permanent slopes in compacted fill areas less than about 12 feet in height, recommended maximum configurations for on-site materials is 3 (Horizontal):1 (Vertical).

The face of all slopes should be compacted to the minimum specification for fill embankments. Alternately, fill slopes can be over-built and trimmed to compacted material.

For permanent slopes in cut areas less than about 12 feet in height, recommended maximum configurations for on-site materials are as follows:

| Material | Maximum Slope Horizontal:Vertical |
|---|---|
| Cohesive soils (clays and silts) | 3:1 |
| Cohesionless soils (sands) | 2-1/2:1 |
| Bedrock | 2:1 |

If steeper slopes are required for site development, stability analyses should be completed to design the grading plan.

Saturation or near saturation of the slopes may likely result in slope failure, even if the slopes are constructed to the recommended configurations. If saturated conditions are likely, due to irrigation, surface flows or other sources, Terracon should be informed and stability analyses should be performed.

**Excavation and Trench Construction:** Excavations into the on-site soils will encounter a variety of conditions. Excavations into the clays and bedrock can be expected to stand on relatively steep temporary slopes during construction. However, caving soils and groundwater may also be encountered. The individual contractor(s) should be made responsible for designing and constructing stable, temporary excavations as required to maintain stability of both the excavation sides and bottom. All excavations should be sloped or shored in the interest of safety following local and federal regulations, including current OSHA excavation and trench safety standards.

The soils to be penetrated by the proposed excavations may vary significantly across the site. The contractor should verify that similar conditions exist throughout the proposed area of excavation. If different subsurface conditions are encountered at the time of construction, the actual conditions should be evaluated to determine any excavation modifications necessary to maintain safe conditions.

As a safety measure, it is recommended that all vehicles and soil piles be kept to a minimum lateral distance from the crest of the slope equal to no less than the slope height. The exposed slope face should be protected against the elements.

**Additional Design and Construction Considerations:**

**Exterior Slab Design and Construction:** Compacted subgrade or existing clay soils and claystone will expand with increasing moisture content; therefore, exterior concrete grade slabs may heave, resulting in cracking or vertical offsets. The potential for

damage would be greatest where exterior slabs are constructed adjacent to the building or other structural elements. To reduce the potential for damage, we recommend:

- exterior slabs be supported on fill with no, or very low expansion potential;
- strict moisture-density control during placement of subgrade fills;
- placement of effective control joints on relatively close centers and isolation joints between slabs and other structural elements;
- provision for adequate drainage in areas adjoining the slabs; and
- use of designs which allow vertical movement between the exterior slabs and adjoining structural elements.

In those locations where movement of exterior slabs must be held to a minimum, consideration should be given to:

- constructing slabs with a stem or key-edge, a minimum of 6 inches in width and at least 12 inches below grade;
- supporting keys or stems on drilled piers; or
- providing structural exterior slabs supported on foundations similar to the building.

**Underground Utility Systems:** All piping should be adequately bedded for proper load distribution. Where utilities are excavated below groundwater, temporary dewatering will be required during excavation, pipe placement and backfilling operations for proper construction. Utility trenches should be excavated on safe and stable slopes in accordance with OSHA regulations as discussed above. Backfill should consist of the on-site soils or existing bedrock. If bedrock is used, all plus 6-inch material should be removed from it prior to its use. The pipe backfill should be compacted to a minimum of 95 percent of Standard Proctor Density ASTM D698.

All underground piping within or near the proposed structure should be designed with flexible couplings, so minor deviations in alignment do not result in breakage or distress. Utility knockouts in grade beams should be oversized to accommodate differential movements.

**Corrosion Protection:** Results of soluble sulfate testing indicate that ASTM Type II Portland cement is suitable for all concrete on and below grade. Foundation concrete should be designed for moderate sulfate exposure in accordance with the provisions of the ACI Design Manual, Section 318, Chapter 4.

**Surface Drainage:** Positive drainage should be provided during construction and maintained throughout the life of the proposed project. Infiltration of water into utility or foundation excavations must be prevented during construction. Planters and other surface features which could retain water in areas adjacent to the building or pavements should be sealed or eliminated. In areas where sidewalks or paving do not immediately adjoin the structure, we recommend that protective slopes be provided with a minimum grade of approximately 10 percent for at least 5 feet from perimeter walls. Backfill against footings, exterior walls, and in utility and sprinkler line trenches should be well compacted and free of all construction debris to reduce the possibility of moisture infiltration.

Downspouts, roof drains or scuppers should discharge into splash blocks or extensions when the ground surface beneath such features is not protected by exterior slabs or paving. Sprinkler systems should not be installed within 5 feet of foundation walls. Landscaped irrigation adjacent to the foundation system should be minimized or eliminated.

## GENERAL COMMENTS

Supplemental exploration and analyses should be undertaken in order to develop final design parameters and to confirm and/or modify the preliminary recommendations and conclusions contained in this report.

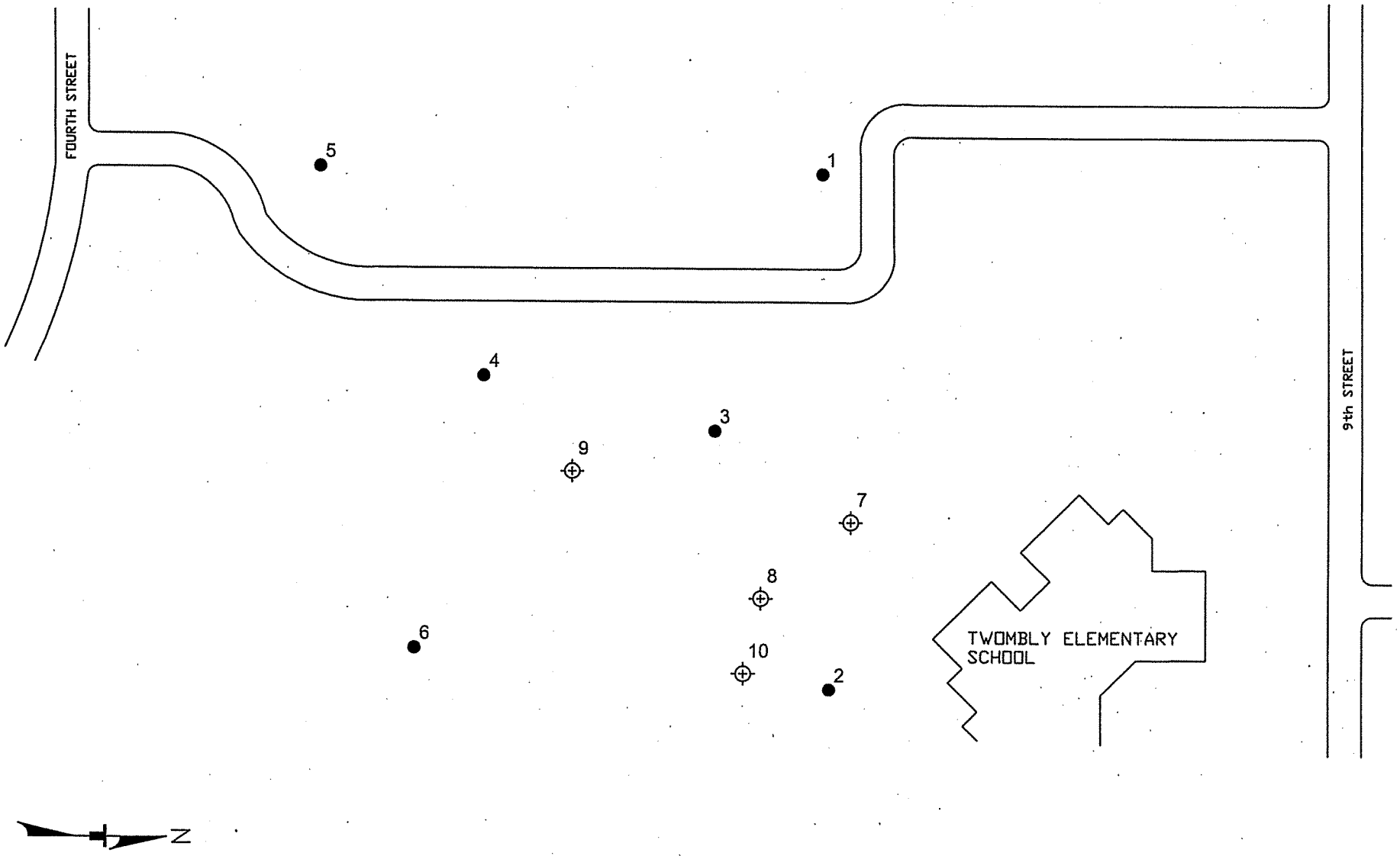
Terracon should be retained to review the final design plans and specifications so comments can be made regarding interpretation and implementation of our geotechnical recommendations in the design and specifications. Terracon also should be retained to provide testing and observation during excavation, grading, foundation and construction phases of the project.

The analysis and recommendations presented in this preliminary report are based upon the data obtained from the borings performed at the indicated locations and from other information discussed in this report. This report does not reflect variations that may occur between borings, across the site, or due to the modifying effects of weather. The nature and extent of such variations may not become evident until during or after construction. If variations appear, we should be immediately notified so that further evaluation and supplemental recommendations can be provided.

The scope of services for this project does not include, either specifically or by implication, any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is

concerned about the potential for such contamination or pollution, other studies should be undertaken.

This preliminary report has been prepared for the exclusive use of our client for specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. No warranties, either express or implied, are intended or made. Site safety, excavation support, and dewatering requirements are the responsibility of others. In the event that changes in the nature, design, or location of the project as outlined in this report are planned, the conclusions and recommendations contained in this report shall not be considered valid unless Terracon reviews the changes and either verifies or modifies the conclusions of this report in writing.




NOT TO SCALE

# FIGURE-1 BORING LOCATION MAP

7 APPROXIMATE BORROW PIT BORING LOCATION

1 APPROXIMATE BORING LOCATION

PARCEL A - COYOTE CREEK SUBDIVISION
FORT LUPTON, COLORADO

PROJECT NUMBER: 25025241 DATE: OCTOBER 25, 2002 DRAWN BY: KMS

Terracon

# LOG OF BORING NO. 1



CLIENT: Matrix Funding Corporation

PROJECT: Proposed Multi- Family Residential Development

SITE: Fort Lupton, Colorado

PROJECT: Parcel A- Coyote Creek Subdivision

Approx. Surface Elev.: 4913.5 ft

| DEPTH, ft. | USCS SYMBOL | SAMPLES NUMBER | SAMPLES TYPE | SAMPLES RECOVERY, in. | SAMPLES BLOWS / in. | TESTS WATER CONTENT, % | TESTS DRY UNIT WT pcf | TESTS UNCONFINED STRENGTH, psf | TESTS % Swell or Consol/ Surcharge Load |
|---|---|---|---|---|---|---|---|---|---|
| | SM | 1 | RS | 12 | 29/12 | 4 | 105 | | |
| 5 | SM | 2 | RS | 12 | 10/12 | 9 | 101 | | -1.6/ 500PSF |
| | CL | 3 | RS | 12 | 14/12 | | | | |
| 10 | | 4 | RS | 12 | 39/12 | | | | |
| 15 | | 5 | RS | 6 | 50/6 | | | | |
| 20 | | 6 | RS | 4 | 50/4 | | | | |
| 25 | | | | | | | | | |

SILTY SAND, fine to coarse grained, loose to medium dense, brown to dark brown, dry to moist

6 — 4907.5

LEAN CLAY, with sand, stiff, brown, moist

▼

14.5 — 4899

SANDY CLAYSTONE, firm to hard, gray to brown, moist to wet, with sandstone lenses

▽

20.5 — 4893

SANDSTONE, fine grained, very hard, strongly cemented, brown, moist to wet

25 — 4888.5

Stopped boring at 25 feet

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

| WATER LEVEL OBSERVATIONS, ft | | | | |
|---|---|---|---|---|
| WL | ▽ 19.5 | WD | ▼ 10 | 10/16/02 |
| WL | ▽ | | ▼ | |
| WL | | | | |

Terracon

| | | | |
|---|---|---|---|
| BORING STARTED | 10-10-02 | | |
| BORING COMPLETED | 10-10-02 | | |
| RIG | CME 55 | FOREMAN | SF |
| APPROVED | MEA | JOB # | 25025241 |

BOREHOLE 99 25025241.GPJ TERRACON.GDT 10/29/02

# LOG OF BORING NO. 2



CLIENT: Matrix Funding Corporation

PROJECT: Proposed Multi- Family Residential Development

SITE: Fort Lupton, Colorado

PROJECT: Parcel A- Coyote Creek Subdivision

| GRAPHIC LOG | DESCRIPTION | DEPTH, ft. | USCS SYMBOL | SAMPLES NUMBER | SAMPLES TYPE | SAMPLES RECOVERY, in. | SAMPLES BLOWS / in. | TESTS WATER CONTENT, % | TESTS DRY UNIT WT pcf | TESTS UNCONFINED STRENGTH, psf | % Swell or Consol/ Surcharge Load |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Approx. Surface Elev.: 4925 ft | | | | | | | | | | |
| | SILTY SAND, fine to medium grained, medium dense, tan to light brown, iron staining, dry to moist | | SM | 1 | RS | 12 | 29/12 | 2 | 102 | | |
| | 3.5 4921.5 | | | | | | | | | | |
| | SANDSTONE, fine grained, firm, weak cementation, brown, iron staining, moist | | | 2 | RS | 12 | 34/12 | 2 | 112 | | |
| | 6.5 4918.5 | 5 | | | | | | | | | |
| | CLAYSTONE, firm to medium hard, dark brown to gray, trace lignite, moist | | | 3 | RS | 12 | 36/12 | 14 | 117 | | +10.5/ 500PSF |
| | | 10 | | | | | | | | | |
| | | | | 4 | RS | 12 | 32/12 | | | | |
| | | 15 | | | | | | | | | |
| | | | | 5 | RS | 10 | 50/10 | | | | |
| | | 20 | | | | | | | | | |
| | 25 4900 | 25 | | | | | | | | | |
| | Stopped boring at 25 feet | | | | | | | | | | |

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

| WATER LEVEL OBSERVATIONS, ft | | | |
|---|---|---|---|
| WL | ▽ NONE WD | ▼ DCI@10/16/02 | |
| WL | ▽ | ▼ | |
| WL | | | |

Terracon

| | | | |
|---|---|---|---|
| BORING STARTED | 10-10-02 | | |
| BORING COMPLETED | 10-10-02 | | |
| RIG | CME 55 | FOREMAN | SF |
| APPROVED | MEA | JOB # | 25025241 |

BOREHOLE 99 25025241.GPJ TERRACON.GDT 10/29/02

# LOG OF BORING NO. 3



CLIENT: Matrix Funding Corporation

PROJECT: Proposed Multi- Family Residential Development

SITE: Fort Lupton, Colorado

PROJECT: Parcel A- Coyote Creek Subdivision

| GRAPHIC LOG | DESCRIPTION | DEPTH, ft. | USCS SYMBOL | SAMPLES NUMBER | SAMPLES TYPE | SAMPLES RECOVERY, in. | SAMPLES BLOWS / in. | TESTS WATER CONTENT, % | TESTS DRY UNIT WT pcf | TESTS UNCONFINED STRENGTH, psf | % Swell or Consol/ Surcharge Load |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Approx. Surface Elev.: 4920 ft | | | | | | | | | | |
| | SANDY LEAN CLAY, very stiff, light brown to brown, dry to moist | | CL | 1 | RS | 12 | 33/12 | 10 | 102 | | |
| | 3.5 4916.5 | | | | | | | | | | |
| | CLAYSTONE, with sand, weathered to hard, gray to brown, iron staining, moist to wet, varies to SANDY CLAYSTONE | | | 2 | RS | 12 | 21/12 | 11 | 108 | | +2.1/ 500PSF |
| | | 5 | | | | | | | | | |
| | | | | 3 | RS | 12 | 24/12 | | | | |
| | | 10 | | | | | | | | | |
| | | | | 4 | RS | 12 | 41/12 | | | | |
| | | 15 | | | | | | | | | |
| | 20 4900 | | | 5 | RS | 8 | 50/8 | | | | |
| | Stopped boring at 20 feet | 20 | | | | | | | | | |

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

| WATER LEVEL OBSERVATIONS, ft | | | | |
|---|---|---|---|---|
| WL | ▽ 14.5 | WD | ▼ 8 | 10/16/02 |
| WL | ▽ | | ▼ | |
| WL | | | | |

Terracon

| | | | |
|---|---|---|---|
| BORING STARTED | 10-10-02 | | |
| BORING COMPLETED | 10-10-02 | | |
| RIG | CME 55 | FOREMAN | SF |
| APPROVED | MEA | JOB # | 25025241 |

BOREHOLE 99 25025241.GPJ TERRACON.GDT 10/29/02

# LOG OF BORING NO. 4



CLIENT: Matrix Funding Corporation

PROJECT: Proposed Multi- Family Residential Development

SITE: Fort Lupton, Colorado

PROJECT: Parcel A- Coyote Creek Subdivision

| GRAPHIC LOG | DESCRIPTION | DEPTH, ft. | USCS SYMBOL | SAMPLES NUMBER | SAMPLES TYPE | SAMPLES RECOVERY, in. | SAMPLES BLOWS / in. | TESTS WATER CONTENT, % | TESTS DRY UNIT WT pcf | TESTS UNCONFINED STRENGTH, psf | % Swell or Consol/ Surcharge Load |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Approx. Surface Elev.: 4920.5 ft | | | | | | | | | | |
| | SANDY LEAN CLAY, very stiff, brown, dry to moist | | | | | | | | | | |
| | 3 4917.5 | | CL | 1 | RS | 12 | 29/12 | 6 | 108 | | -1.5/ 500PSF |
| | CLAYEY SAND, fine grained, medium dense, light brown, dry to moist | | SC | 2 | RS | 12 | 23/12 | 6 | 112 | | |
| | 5.5 4915 | 5 | | | | | | | | | |
| | SANDY CLAYSTONE, medium hard, brown, iron staining, moist to wet ▼ | | | 3 | RS | 12 | 50/12 | 15 | 117 | | |
| | 12.5 ▽ 4908 | 10 | | | | | | | | | |
| | CLAYSTONE, with sand, firm, dark brown to gray brown, iron staining, moist to wet | | | 4 | RS | 12 | 39/12 | | | | |
| | 17.5 4903 | 15 | | | | | | | | | |
| | SANDSTONE, fine grained, medium hard, weak to moderate cementation, brown, moist to wet | | | 5 | RS | 11 | 50/11 | | | | |
| | 20 4900.5 | 20 | | | | | | | | | |
| | Stopped boring at 20 feet | | | | | | | | | | |

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

| WATER LEVEL OBSERVATIONS, ft | | | | |
|---|---|---|---|---|
| WL | ▽ 12.5 | WD | ▼ 9.5 | 10/16/02 |
| WL | ▽ | | ▼ | |
| WL | | | | |

Terracon

| | | | |
|---|---|---|---|
| BORING STARTED | 10-10-02 | | |
| BORING COMPLETED | 10-10-02 | | |
| RIG | CME 55 | FOREMAN | SF |
| APPROVED | MEA | JOB # | 25025241 |

BOREHOLE 99 25025241.GPJ TERRACON.GDT 10/29/02

# LOG OF BORING NO. 5



CLIENT: Matrix Funding Corporation

PROJECT: Proposed Multi- Family Residential Development

SITE: Fort Lupton, Colorado

PROJECT: Parcel A- Coyote Creek Subdivision

| GRAPHIC LOG | DESCRIPTION | DEPTH, ft. | USCS SYMBOL | SAMPLES NUMBER | SAMPLES TYPE | SAMPLES RECOVERY, in. | SAMPLES BLOWS / in. | TESTS WATER CONTENT, % | TESTS DRY UNIT WT pcf | TESTS UNCONFINED STRENGTH, psf | % Swell or Consol/ Surcharge Load |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Approx. Surface Elev.: 4916.5 ft | | | | | | | | | | |
| | SILTY SAND, fine to coarse grained, trace gravel, loose, dark brown, moist | 0 | SM | 1 | RS | 12 | 17/12 | 11 | 117 | | |
| | 3 4913.5 | | | | | | | | | | |
| | CLAYSTONE, weathered, light gray to grey, moist | | | 2 | RS | 12 | 12/12 | 15 | 116 | | -0.3/ 500PSF |
| | 7 4909.5 | 5 | | | | | | | | | |
| | SANDSTONE, fine grained, some clay, medium hard to very hard, weakly to strongly cemented, grey to light brown, moist to wet ▼ ▽ | 10 | | 3 | RS | 9 | 50/9 | | | | |
| | | 15 | | 4 | RS | NR | 50/5 | | | | |
| | 20 4896.5 | 20 | | 5 | RS | 8 | 50/8 | | | | |
| | Stopped boring at 20 feet | | | | | | | | | | |

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

| WATER LEVEL OBSERVATIONS, ft | | | | |
|---|---|---|---|---|
| WL | ▽ 14 | WD | ▼ 11 | 10/16/02 |
| WL | ▽ | | ▼ | |
| WL | | | | |

Terracon

| | | | |
|---|---|---|---|
| BORING STARTED | 10-10-02 | | |
| BORING COMPLETED | 10-10-02 | | |
| RIG | CME 55 | FOREMAN | SF |
| APPROVED | MEA | JOB # | 25025241 |

BOREHOLE 99 25025241.GPJ TERRACON.GDT 10/29/02

# LOG OF BORING NO. 6



CLIENT: Matrix Funding Corporation

PROJECT: Proposed Multi- Family Residential Development

SITE: Fort Lupton, Colorado

PROJECT: Parcel A- Coyote Creek Subdivision

| GRAPHIC LOG | DESCRIPTION | DEPTH, ft. | USCS SYMBOL | SAMPLES NUMBER | SAMPLES TYPE | SAMPLES RECOVERY, in. | SAMPLES BLOWS / in. | TESTS WATER CONTENT, % | TESTS DRY UNIT WT pcf | TESTS UNCONFINED STRENGTH, psf | TESTS % Swell or Consol/ Surcharge Load |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Approx. Surface Elev.: 4930 ft | | | | | | | | | | |
| | SILTY SAND, fine grained, loose, light gray, moist | | SM | 1 | RS | 12 | 9/12 | 9 | 112 | | -0.6/ 500PSF |
| | 4 4926 | | | | | | | | | | |
| | SILTY SANDSTONE, fine to medium grained, trace claystone fragments, weathered, weakly cemented, light gray to yellow brown, moist to wet ▽ ▼ | 5 | | 2 | RS | 12 | 14/12 | 11 | 104 | | |
| | | 10 | | 3 | RS | 12 | 13/12 | 22 | 103 | | |
| | 12 4918 | | | | | | | | | | |
| | SANDY CLAYSTONE, firm to medium hard, gray to brown, moist | 15 | | 4 | RS | 12 | 38/12 | | | | |
| | 20 4910 | 20 | | 5 | RS | 9 | 50/9 | | | | |
| | Stopped boring at 20 feet | | | | | | | | | | |

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

| WATER LEVEL OBSERVATIONS, ft | | | | |
|---|---|---|---|---|
| WL | ▽ 5 | WD | ▼ 7 | 10/16/02 |
| WL | ▽ | | ▼ | |
| WL | | | | |

Terracon

| | | | |
|---|---|---|---|
| BORING STARTED | 10-10-02 | | |
| BORING COMPLETED | 10-10-02 | | |
| RIG | CME 55 | FOREMAN | SF |
| APPROVED | MEA | JOB # | 25025241 |

BOREHOLE 99 25025241.GPJ TERRACON.GDT 10/29/02

# LOG OF BORING NO. 7



CLIENT: Matrix Funding Corporation

PROJECT: Proposed Multi- Family Residential Development

SITE: Fort Lupton, Colorado

PROJECT: Parcel A- Coyote Creek Subdivision

Approx. Surface Elev.: 4920.5 ft

| DEPTH, ft. | USCS SYMBOL | SAMPLES NUMBER | SAMPLES TYPE | SAMPLES RECOVERY, in. | SAMPLES BLOWS / in. | TESTS WATER CONTENT, % | TESTS DRY UNIT WT pcf | TESTS UNCONFINED STRENGTH, psf | TESTS % Swell or Consol/ Surcharge Load | DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| | SM | 1 | GRAB | | | | | | | SILTY SAND, fine to coarse grained, medium dense, brown, dry to moist |
| | SM | 2 | RS | 12 | 26/12 | 4 | 102 | | | |
| 5 | SM | 3 | RS | 12 | 41/12 | 3 | 108 | | | |
| 7 | | | | | | | | | | 4913.5 |
| | | 4 | GRAB | | | | | | | CLAYSTONE, trace sand, firm, dark brown, iron staining, moist ▼ |
| 10 | | 5 | RS | 12 | 30/12 | 16 | 116 | | +3.0/ 500PSF | |
| 12 | | | | | | | | | | 4908.5 |
| | | | | | | | | | | SANDY CLAYSTONE, medium hard, light gray, moist |
| 15 | | 6 | RS | 10 | 50/10 | | | | | |
| 17.5 | | | | | | | | | | 4903 |
| | | | | | | | | | | SANDSTONE, fine grained, very hard, weakly cemented, light brown, moist to wet ▽ |
| 20 | | 7 | RS | 5 | 50/5 | | | | | |
| 20 | | | | | | | | | | 4900.5 |
| | | | | | | | | | | Stopped boring at 20 feet |

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

| WATER LEVEL OBSERVATIONS, ft | | | | |
|---|---|---|---|---|
| WL | ▽ 18 | WD | ▽ 10 | 10/16/02 |
| WL | ▽ | | ▽ | |
| WL | | | | |

Terracon

| | | | |
|---|---|---|---|
| BORING STARTED | 10-10-02 | | |
| BORING COMPLETED | 10-10-02 | | |
| RIG | CME 55 | FOREMAN | SF |
| APPROVED | MEA | JOB # | 25025241 |

BOREHOLE 99 25025241.GPJ TERRACON.GDT 10/29/02

# LOG OF BORING NO. 8



CLIENT: Matrix Funding Corporation

PROJECT: Proposed Multi- Family Residential Development

SITE: Fort Lupton, Colorado

PROJECT: Parcel A- Coyote Creek Subdivision

| GRAPHIC LOG | DESCRIPTION | DEPTH, ft. | USCS SYMBOL | SAMPLES NUMBER | SAMPLES TYPE | SAMPLES RECOVERY, in. | SAMPLES BLOWS / in. | TESTS WATER CONTENT, % | TESTS DRY UNIT WT pcf | TESTS UNCONFINED STRENGTH, psf | % Swell or Consol/ Surcharge Load |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Approx. Surface Elev.: 4923.5 ft | | | | | | | | | | |
| | SANDY LEAN CLAY, very stiff, brown, dry to moist | | CL | 1 | GRAB | | | | | | |
| | | | CL | 2 | RS | 12 | 27/12 | 14 | 89 | | |
| | 3.5 4920 | | | | | | | | | | |
| | CLAYSTONE, weathered to medium hard, gray to dark red brown, iron staining, moist, varies to CLAYSTONE, with sand | | | 4 | GRAB | | | | | | |
| | | | | 3 | RS | 12 | 22/12 | 14 | 104 | | +4.9/ 500PSF |
| | | 5 | | | | | | | | | |
| | | 10 | | | | | | | | | |
| | | | | 5 | RS | 11 | 50/11 | | | | |
| | | 15 | | | | | | | | | |
| | 20 4903.5 | | | 6 | RS | 11 | 50/11 | | | | |
| | Stopped boring at 20 feet | 20 | | | | | | | | | |

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

| WATER LEVEL OBSERVATIONS, ft | | |
|---|---|---|
| WL | NONE WD | NONE 10/16/02 |
| WL | | |
| WL | | |

Terracon

| | | | |
|---|---|---|---|
| BORING STARTED | 10-10-02 | | |
| BORING COMPLETED | 10-10-02 | | |
| RIG | CME 55 | FOREMAN | SF |
| APPROVED | MEA | JOB # | 25025241 |

BOREHOLE 99 25025241.GPJ TERRACON.GDT 10/29/02

# LOG OF BORING NO. 9



CLIENT: Matrix Funding Corporation

PROJECT: Proposed Multi- Family Residential Development

SITE: Fort Lupton, Colorado

PROJECT: Parcel A- Coyote Creek Subdivision

| GRAPHIC LOG | DESCRIPTION | DEPTH, ft. | USCS SYMBOL | SAMPLES NUMBER | SAMPLES TYPE | SAMPLES RECOVERY, in. | SAMPLES BLOWS / in. | TESTS WATER CONTENT, % | TESTS DRY UNIT WT pcf | TESTS UNCONFINED STRENGTH, psf | % Swell or Consol/ Surcharge Load |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Approx. Surface Elev.: 4923.5 ft | | | | | | | | | | |
| | CLAYEY SAND, fine to coarse grained, medium dense, brown, moist | | SC | 1 | GRAB | | | | | | |
| | | | SC | 2 | RS | 12 | 20/12 | 15 | 85 | | |
| | 3.5 4920 | | | | | | | | | | |
| | CLAYSTONE, weathered to firm, gray to olive brown, iron staining, moist | | | 3 | RS | 12 | 22/12 | 18 | 98 | | +4.4/ 500PSF |
| | | 5 | | 4 | GRAB | | | | | | |
| | | | | 5 | RS | 12 | 46/12 | | | | |
| | 11 4912.5 | 10 | | | | | | | | | |
| | SANDSTONE, fine grained, trace clay, medium hard to hard, weakly cemented, brown to gray, moist to wet ▼ | | | 6 | RS | 9 | 50/9 | | | | |
| | | 15 | | | | | | | | | |
| | | | | 7 | RS | 7 | 50/7 | | | | |
| | ▽ | 20 | | | | | | | | | |
| | 25 4898.5 | | | 8 | RS | 12 | 50/12 | | | | |
| | Stopped boring at 25 feet | 25 | | | | | | | | | |

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

| WATER LEVEL OBSERVATIONS, ft | | | | |
|---|---|---|---|---|
| WL | ▽ 22.5 | WD | ▼ 12 | 10/16/02 |
| WL | ▽ | | ▼ | |
| WL | | | | |

Terracon

| | | | |
|---|---|---|---|
| BORING STARTED | | | 10-10-02 |
| BORING COMPLETED | | | 10-10-02 |
| RIG | CME 55 | FOREMAN | SF |
| APPROVED | MEA | JOB # | 25025241 |

BOREHOLE 99 25025241.GPJ TERRACON.GDT 10/29/02

# LOG OF BORING NO. 10



CLIENT: Matrix Funding Corporation

PROJECT: Proposed Multi- Family Residential Development

SITE: Fort Lupton, Colorado

PROJECT: Parcel A- Coyote Creek Subdivision

Approx. Surface Elev.: 4927 ft

| DEPTH, ft. | GRAPHIC LOG | DESCRIPTION | USCS SYMBOL | SAMPLES NUMBER | SAMPLES TYPE | SAMPLES RECOVERY, in. | SAMPLES BLOWS / in. | TESTS WATER CONTENT, % | TESTS DRY UNIT WT pcf | TESTS UNCONFINED STRENGTH, psf | TESTS % Swell or Consol/ Surcharge Load |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | SANDY SILT, medium dense, light yellow brown, dry to moist | | | | | | | | | |
| | | | ML | 1 | RS | 12 | 26/12 | 7 | 99 | | |
| 4 | | 4923 | | | | | | | | | |
| | | SILTY SAND, fine to medium grained, loose, yellow brown, dry to moist | SM | 2 | RS | 12 | 14/12 | 1 | | | |
| 5 | | | | | | | | | | | |
| 8.5 | | 4918.5 | | | | | | | | | |
| | | CLAYSTONE, firm to medium hard, olive brown to dark gray, iron staining, trace lignite, moist | | 3 | RS | 12 | 34/12 | 18 | 112 | | +4.4/ 500PSF |
| 10 | | | | | | | | | | | |
| | | | | 4 | RS | 12 | 36/12 | | | | |
| 15 | | | | | | | | | | | |
| | | | | 5 | RS | 10 | 50/10 | | | | |
| 20 | | | | | | | | | | | |
| 25 | | 4902 | | | | | | | | | |
| | | Stopped boring at 25 feet | | | | | | | | | |

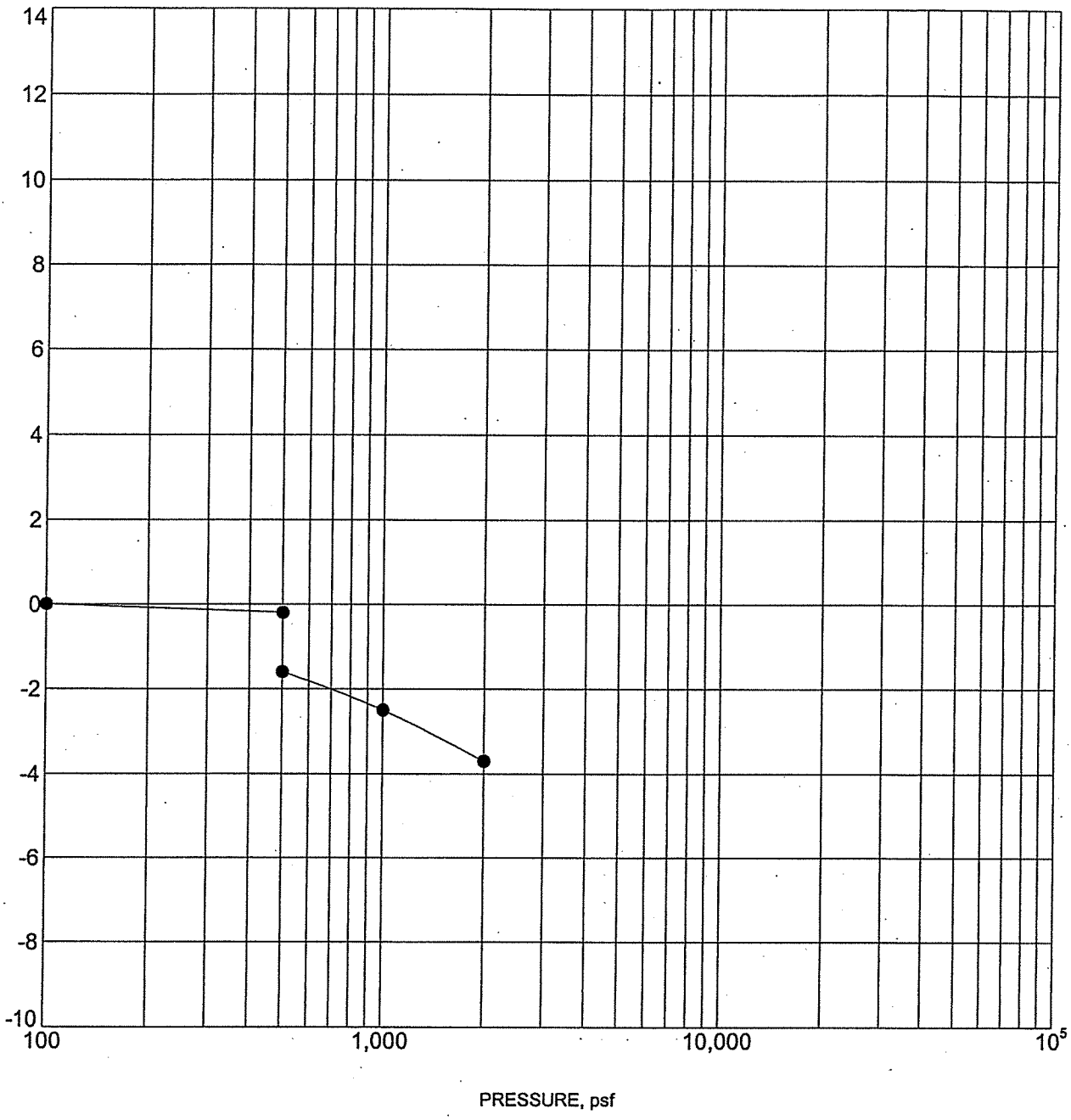
The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

| WATER LEVEL OBSERVATIONS, ft | | | |
|---|---|---|---|
| WL | NONE WD | DCI@23' | 10/16/02 |
| WL | | | |
| WL | | | |

Terracon

| | | | |
|---|---|---|---|
| BORING STARTED | 10-10-02 | | |
| BORING COMPLETED | 10-10-02 | | |
| RIG | CME 55 | FOREMAN | SF |
| APPROVED | MEA | JOB # | 25025241 |

BOREHOLE 99 25025241.GPJ TERRACON.GDT 10/29/02




| Specimen Identification | | Classification | $\gamma_d$, pcf | WC,% |
|---|---|---|---|---|
| ● 1 | 4.0ft | **SILTY SAND** | 101 | 9 |

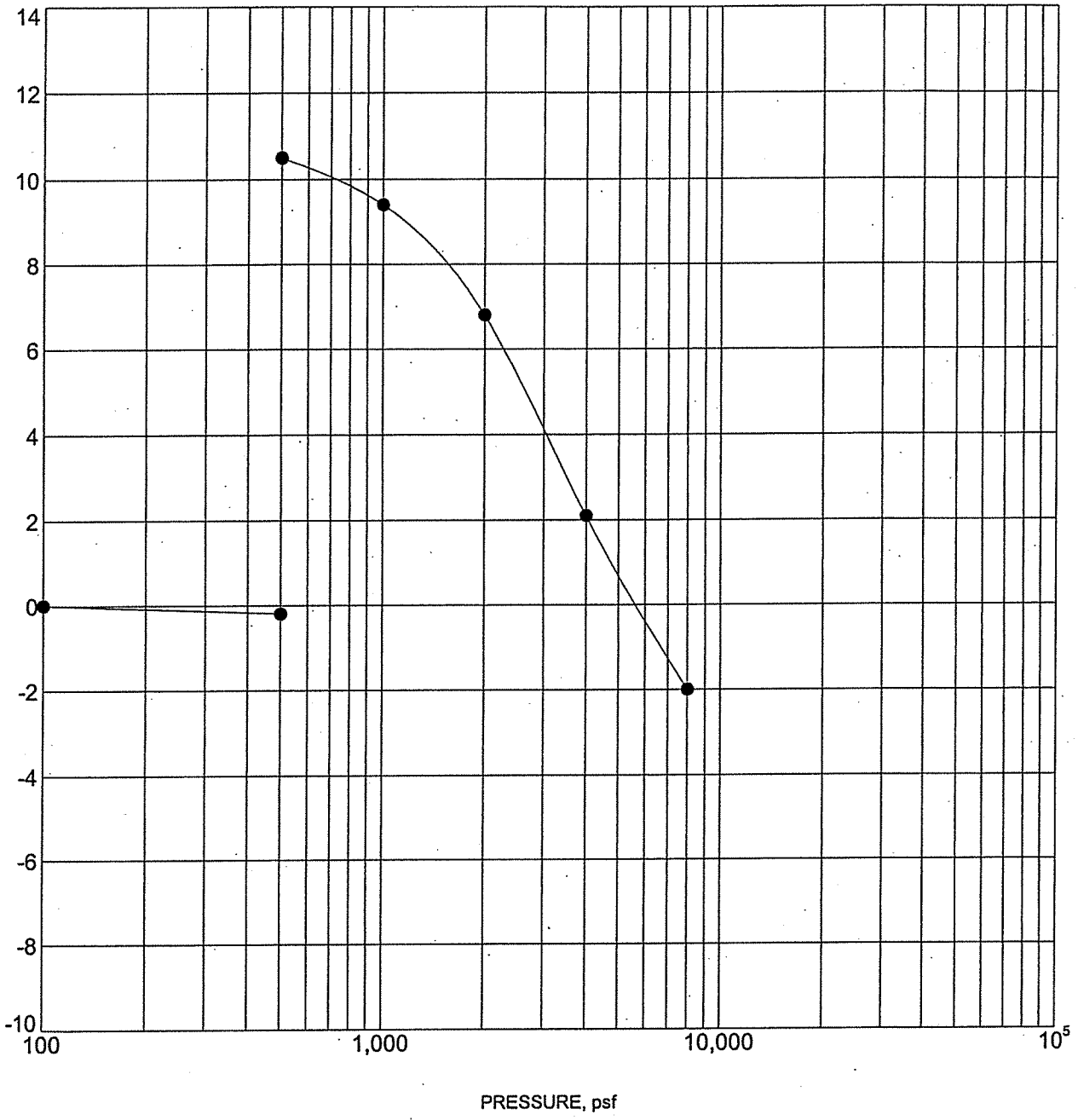
Notes:

TC CONSOL STRAIN 25025241.GPJ TERRACON.GDT 10/29/02

Terracon

## CONSOLIDATION TEST

Project: Parcel A- Coyote Creek Subdivision
Site: Fort Lupton, Colorado
Job #: 25025241
Date: 10-29-02




| Specimen Identification | | Classification | $\gamma_d$, pcf | WC,% |
|---|---|---|---|---|
| ● 2 | 9.0ft | CLAYSTONE | 117 | 14 |

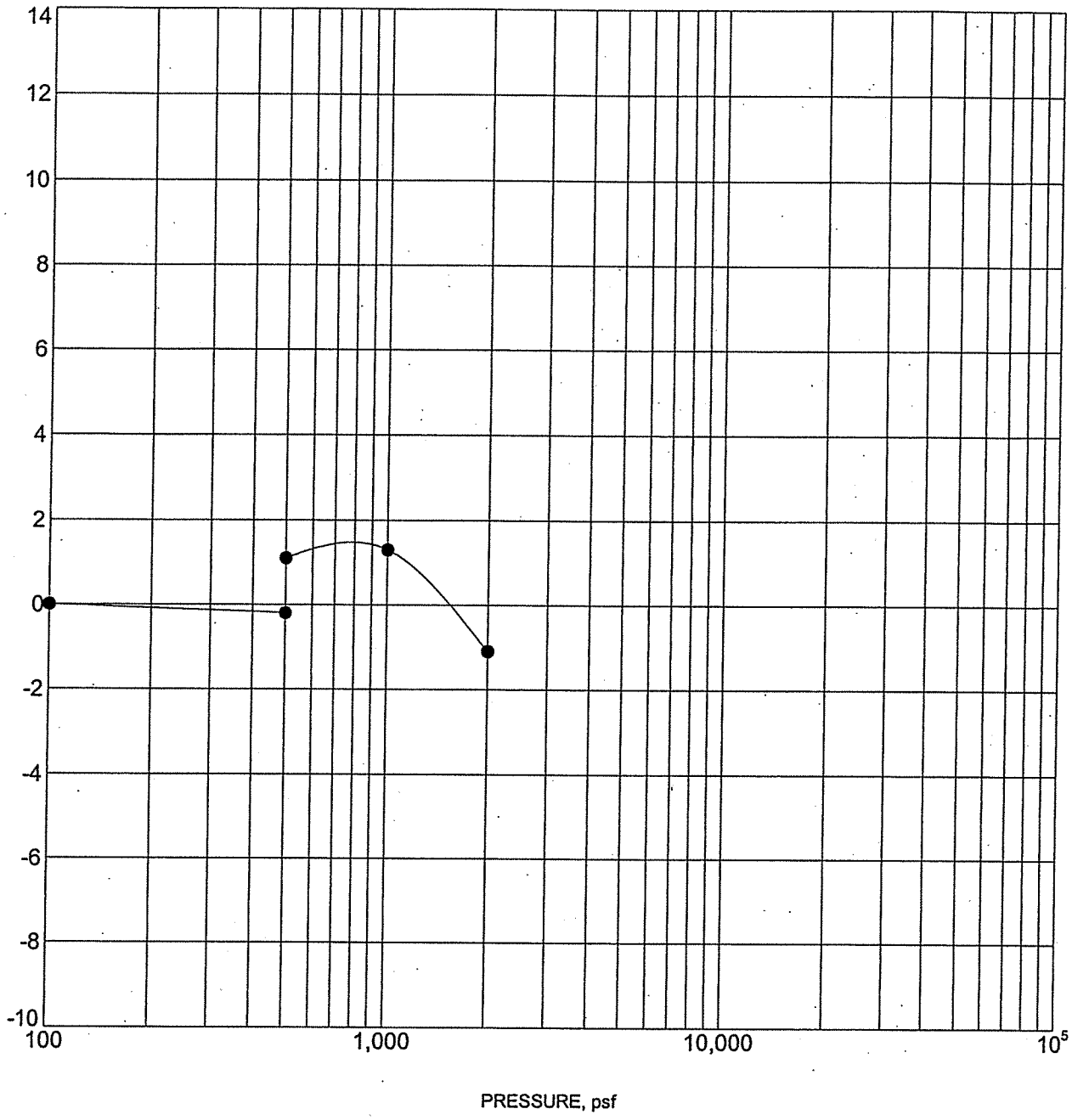
Notes:

Terracon

## CONSOLIDATION TEST

Project: Parcel A- Coyote Creek Subdivision
Site: Fort Lupton, Colorado
Job #: 25025241
Date: 10-29-02

TC CONSOL STRAIN 25025241.GPJ TERRACON.GDT 10/29/02




| Specimen Identification | | Classification | $\gamma_d$, pcf | WC,% |
|---|---|---|---|---|
| ● 3 | 4.0ft | CLAYSTONE | 108 | 11 |

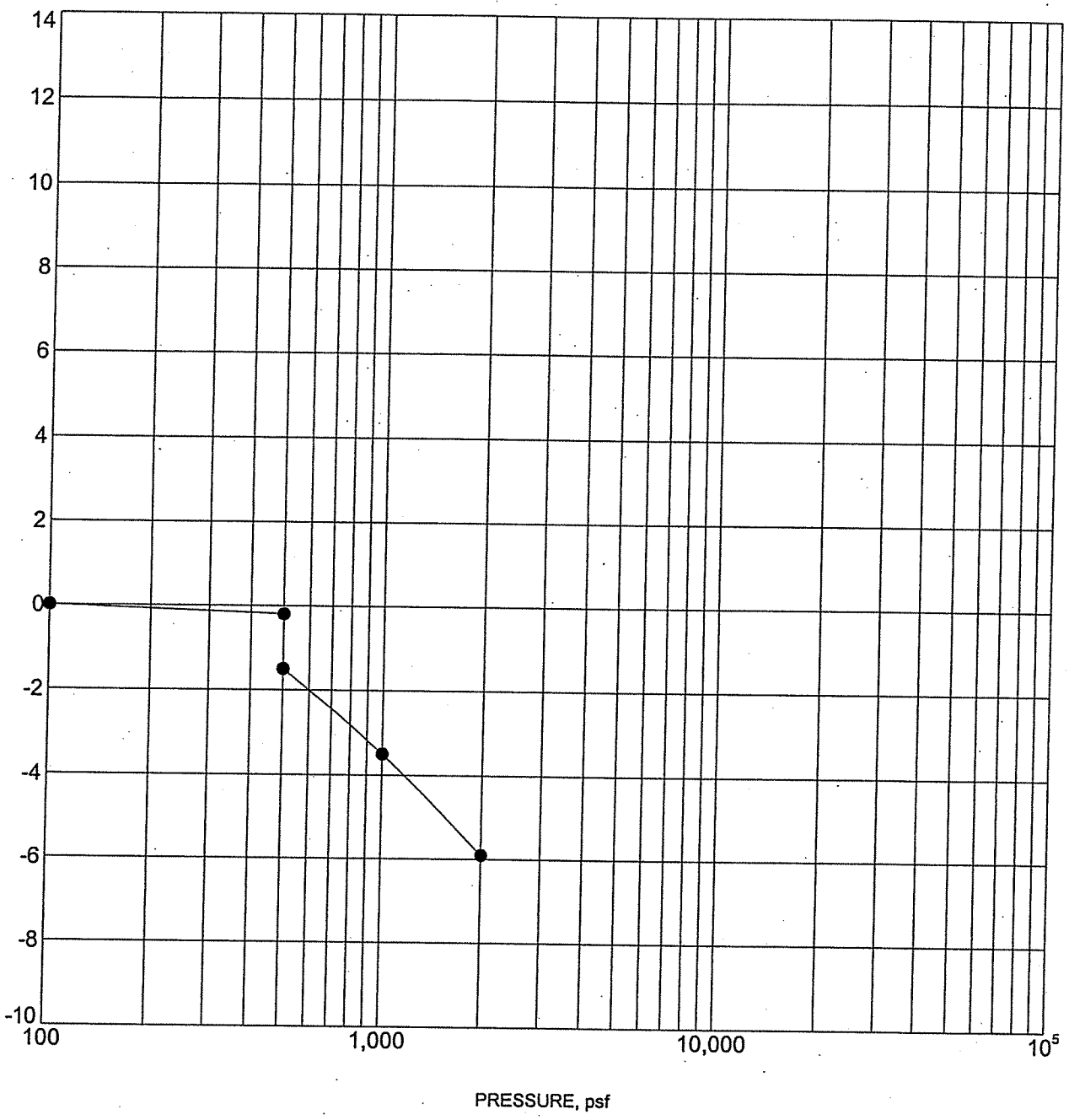
Notes:

TC CONSOL STRAIN 25025241.GPJ TERRACON.GDT 10/29/02

Terracon

## CONSOLIDATION TEST

Project: Parcel A- Coyote Creek Subdivision
Site: Fort Lupton, Colorado
Job #: 25025241
Date: 10-29-02




| Specimen Identification | | Classification | $\gamma_d$, pcf | WC,% |
|---|---|---|---|---|
| ● 4 | 2.0ft | SANDY LEAN CLAY | 108 | 6 |

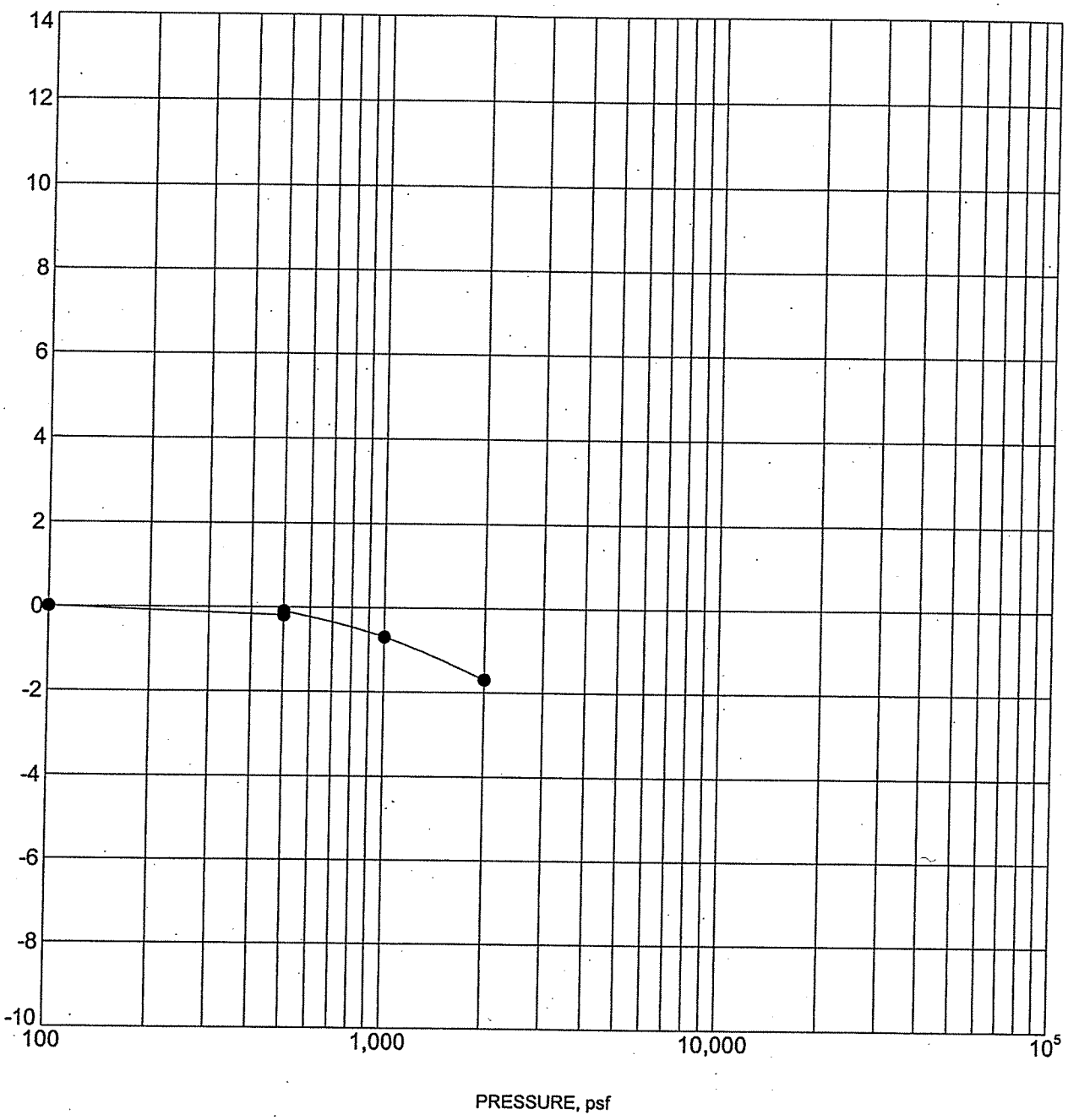
Notes: Disturbed

TC CONSOL STRAIN 25025241.GPJ TERRACON.GDT 10/29/02

Terracon

## CONSOLIDATION TEST

Project: Parcel A- Coyote Creek Subdivision
Site: Fort Lupton, Colorado
Job #: 25025241
Date: 10-29-02




| Specimen Identification | | Classification | $\gamma_d$, pcf | WC,% |
|---|---|---|---|---|
| ● 5 | 4.0ft | CLAYSTONE | 116 | 15 |

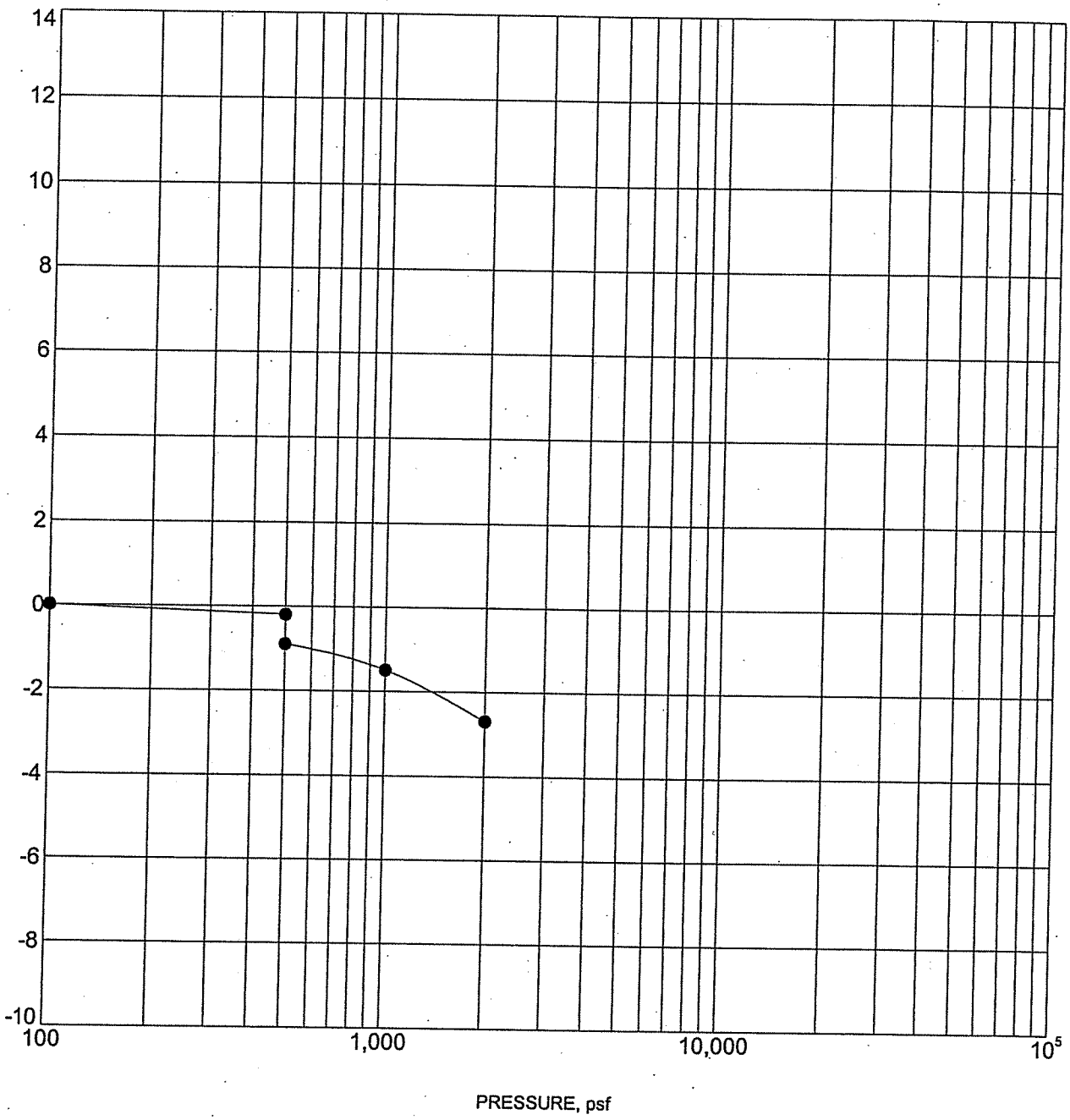
Notes:

TC CONSOL STRAIN 25025241.GPJ TERRACON.GDT 10/29/02

Terracon

## CONSOLIDATION TEST

Project: Parcel A- Coyote Creek Subdivision
Site: Fort Lupton, Colorado
Job #: 25025241
Date: 10-29-02




| Specimen Identification | | Classification | $\gamma_d$, pcf | WC,% |
|---|---|---|---|---|
| ● 6 | 2.0ft | SILTY SAND | 112 | 9 |

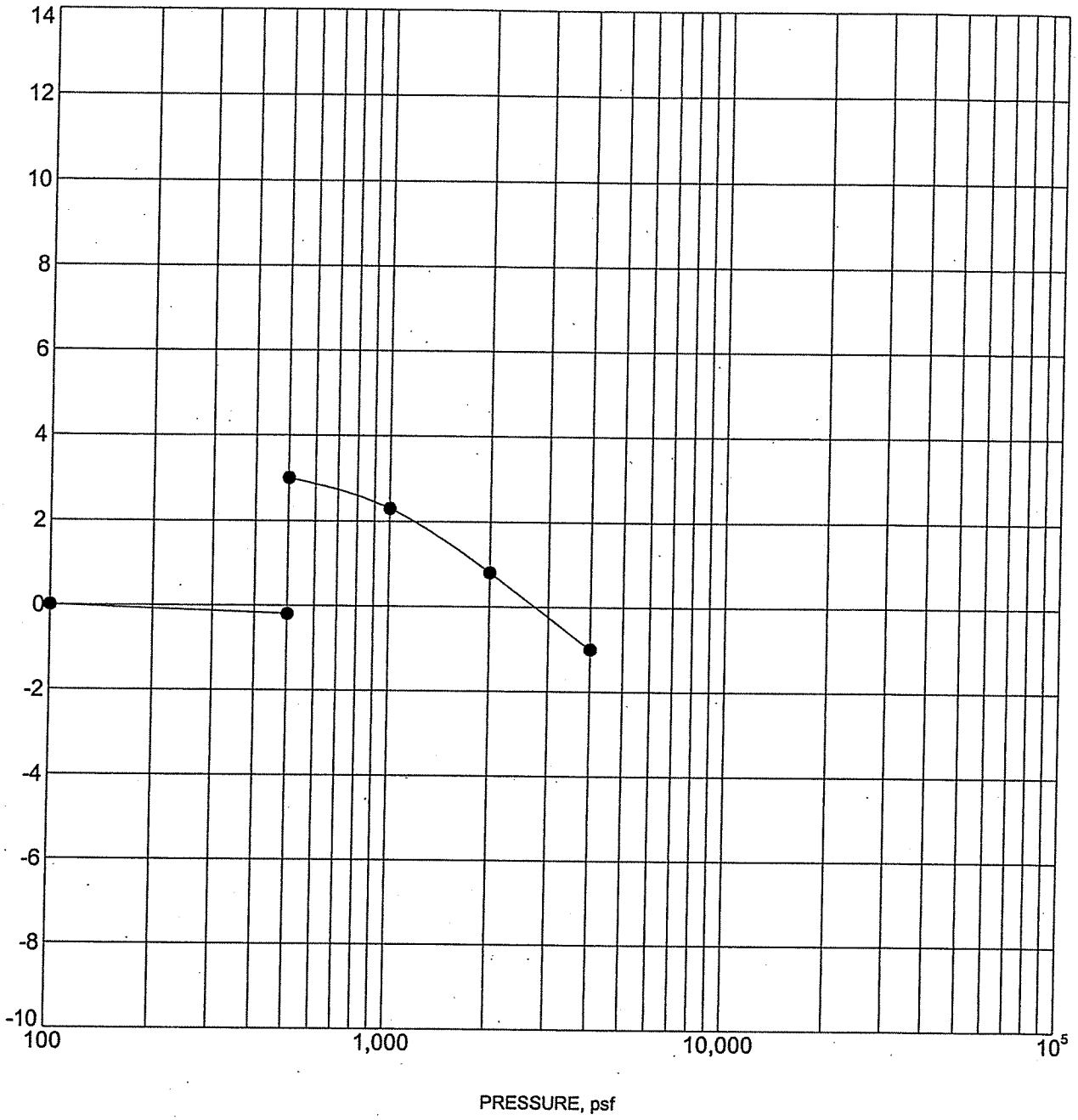
Notes:

TC CONSOL STRAIN 25025241.GPJ TERRACON.GDT 10/29/02

Terracon

## CONSOLIDATION TEST

Project: Parcel A- Coyote Creek Subdivision
Site: Fort Lupton, Colorado
Job #: 25025241
Date: 10-29-02




| Specimen Identification | | Classification | $\gamma_d$, pcf | WC,% |
|---|---|---|---|---|
| ● 7 | 9.0ft | CLAYSTONE | 116 | 16 |

Notes:

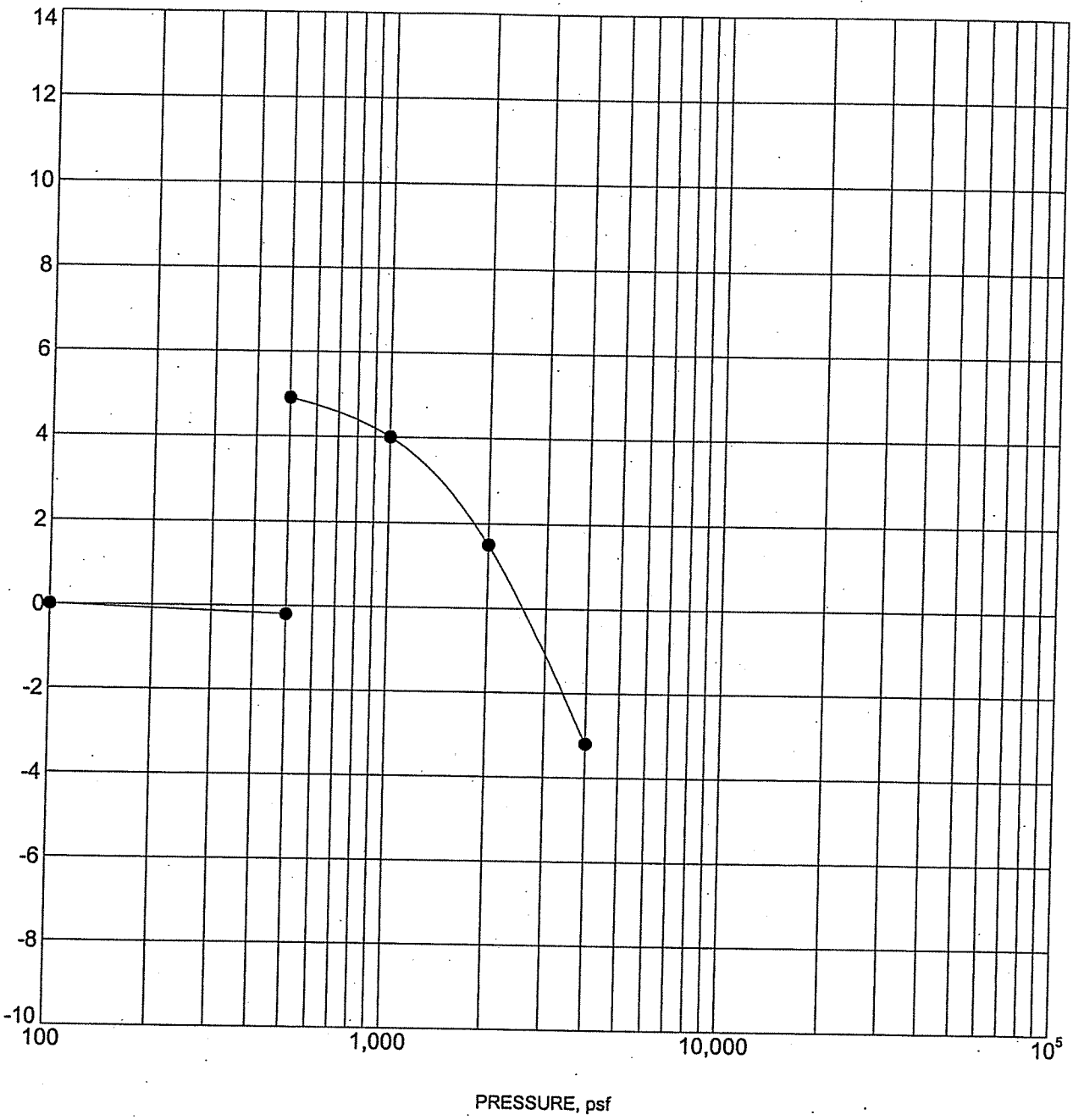
Terracon

## CONSOLIDATION TEST

Project: Parcel A- Coyote Creek Subdivision
Site: Fort Lupton, Colorado
Job #: 25025241
Date: 10-29-02



TC CONSOL STRAIN 25025241.GPJ TERRACON.GDT 10/29/02




| Specimen Identification | | Classification | $\gamma_d$, pcf | WC,% |
|---|---|---|---|---|
| ● 8 | 4.0ft | CLAYSTONE | 104 | 14 |

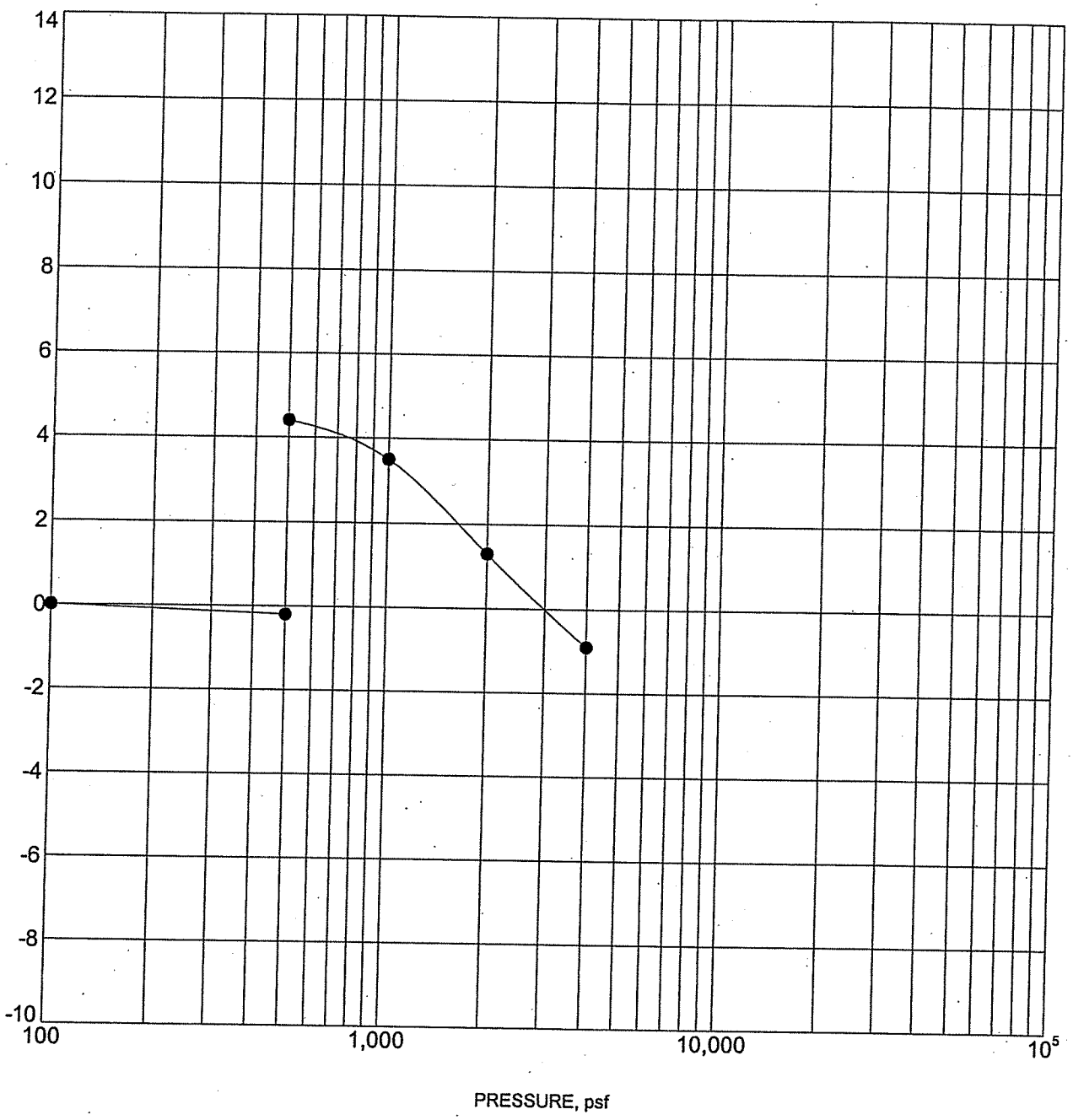
Notes:

TC_CONSOL_STRAIN 25025241.GPJ TERRACON.GDT 10/29/02

Terracon

## CONSOLIDATION TEST

Project: Parcel A- Coyote Creek Subdivision
Site: Fort Lupton, Colorado
Job #: 25025241
Date: 10-29-02




| Specimen Identification | | Classification | $\gamma_d$, pcf | WC,% |
|---|---|---|---|---|
| ● 9 | 4.0ft | CLAYSTONE | 98 | 18 |

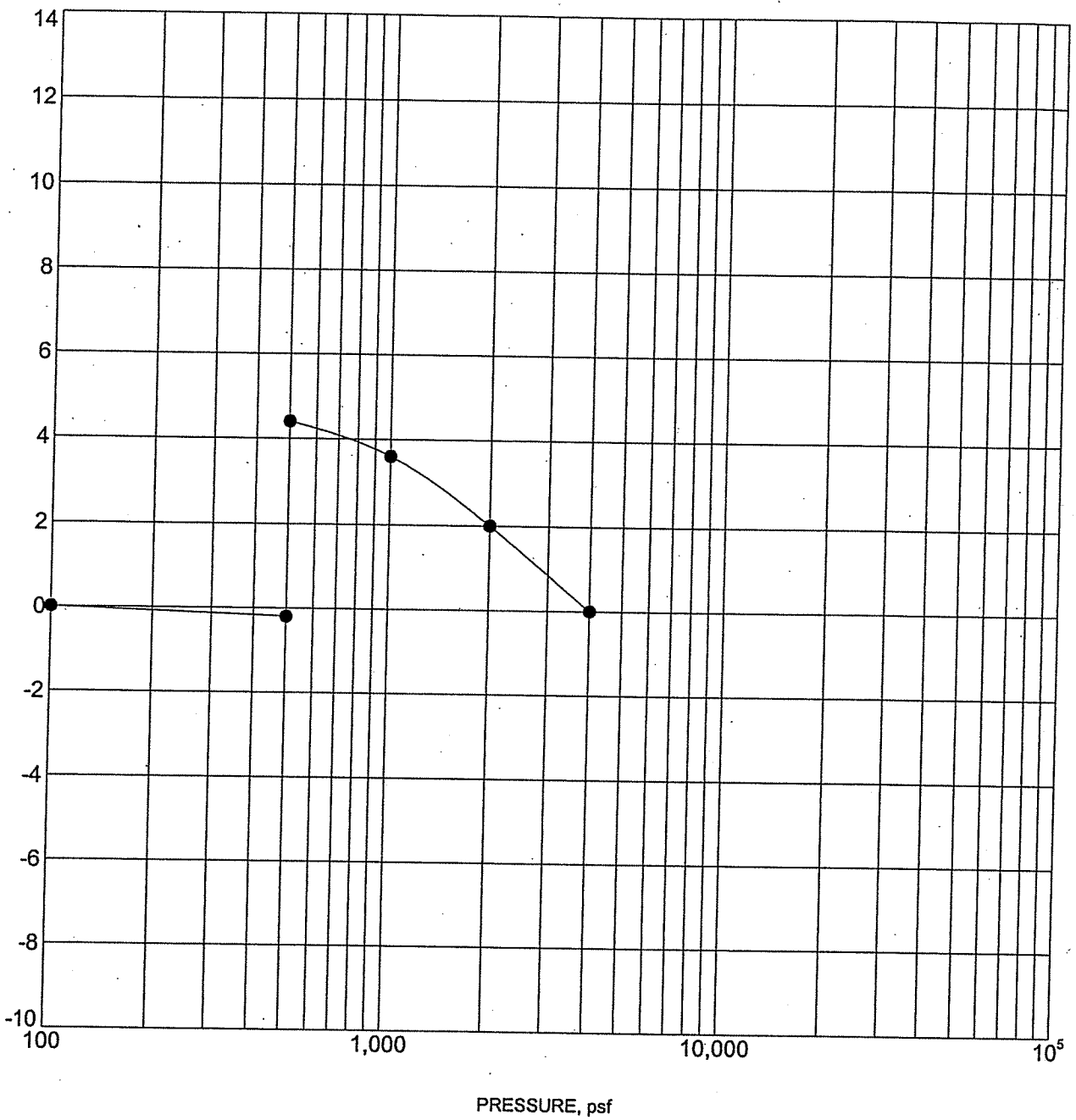
Notes:

TC CONSOL STRAIN 25025241.GPJ TERRACON.GDT 10/29/02

Terracon

## CONSOLIDATION TEST

Project: Parcel A- Coyote Creek Subdivision
Site: Fort Lupton, Colorado
Job #: 25025241
Date: 10-29-02




| Specimen Identification | | Classification | $\gamma_d$, pcf | WC,% |
|---|---|---|---|---|
| ● 10 | 9.0ft | CLAYSTONE | 112 | 18 |

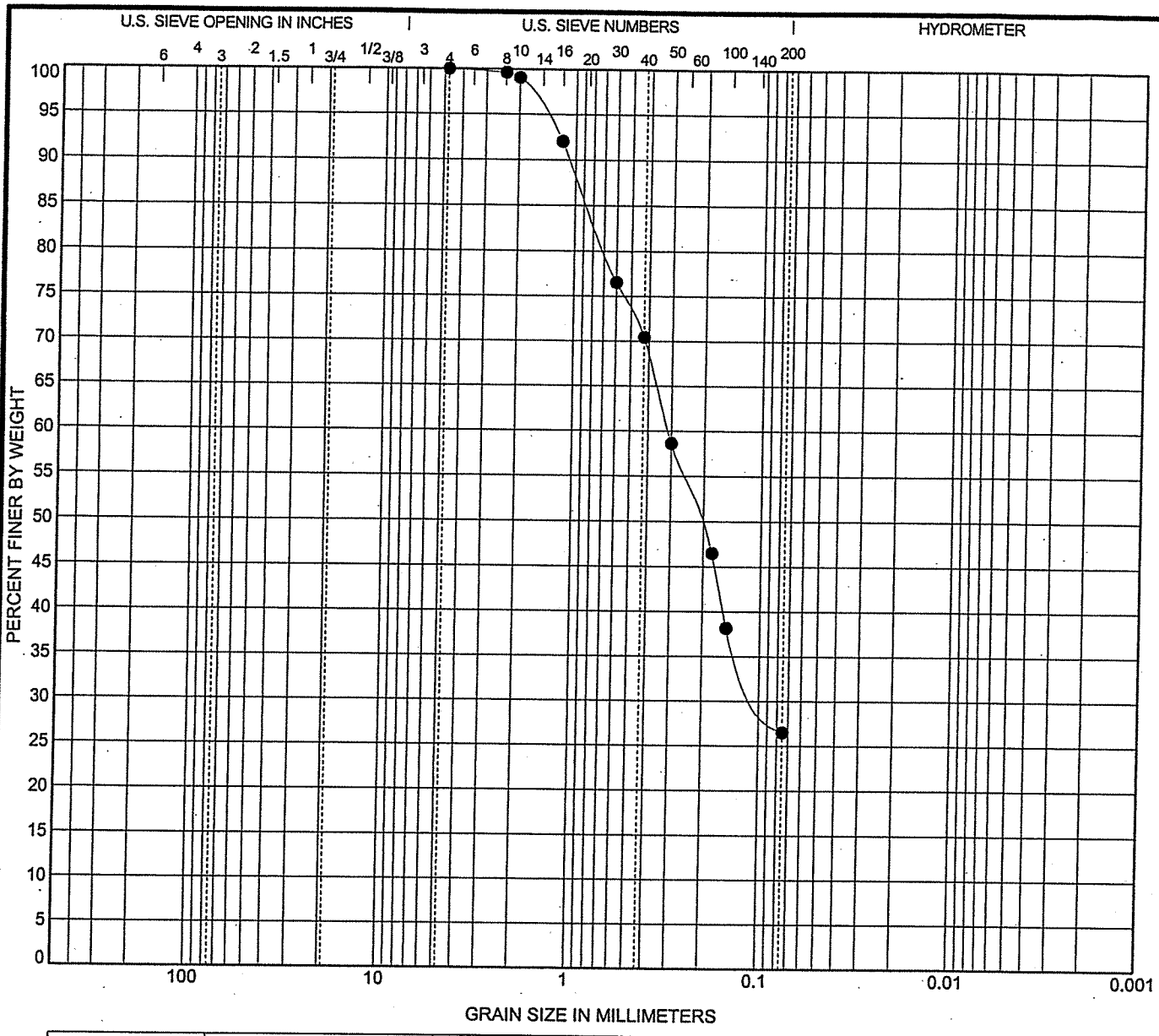
Notes:

TC CONSOL STRAIN 25025241.GPJ TERRACON.GDT 10/29/02

Terracon

## CONSOLIDATION TEST

Project: Parcel A- Coyote Creek Subdivision
Site: Fort Lupton, Colorado
Job #: 25025241
Date: 10-29-02




| COBBLES | GRAVEL | | SAND | | | SILT OR CLAY |
|---|---|---|---|---|---|---|
| | coarse | fine | coarse | medium | fine | |

| | Specimen Identification | Classification | LL | PL | PI | Cc | Cu |
|---|---|---|---|---|---|---|---|
| ● | 1 2.0ft | **SILTY SAND(SM)** | **NP** | **NP** | **NP** | | |

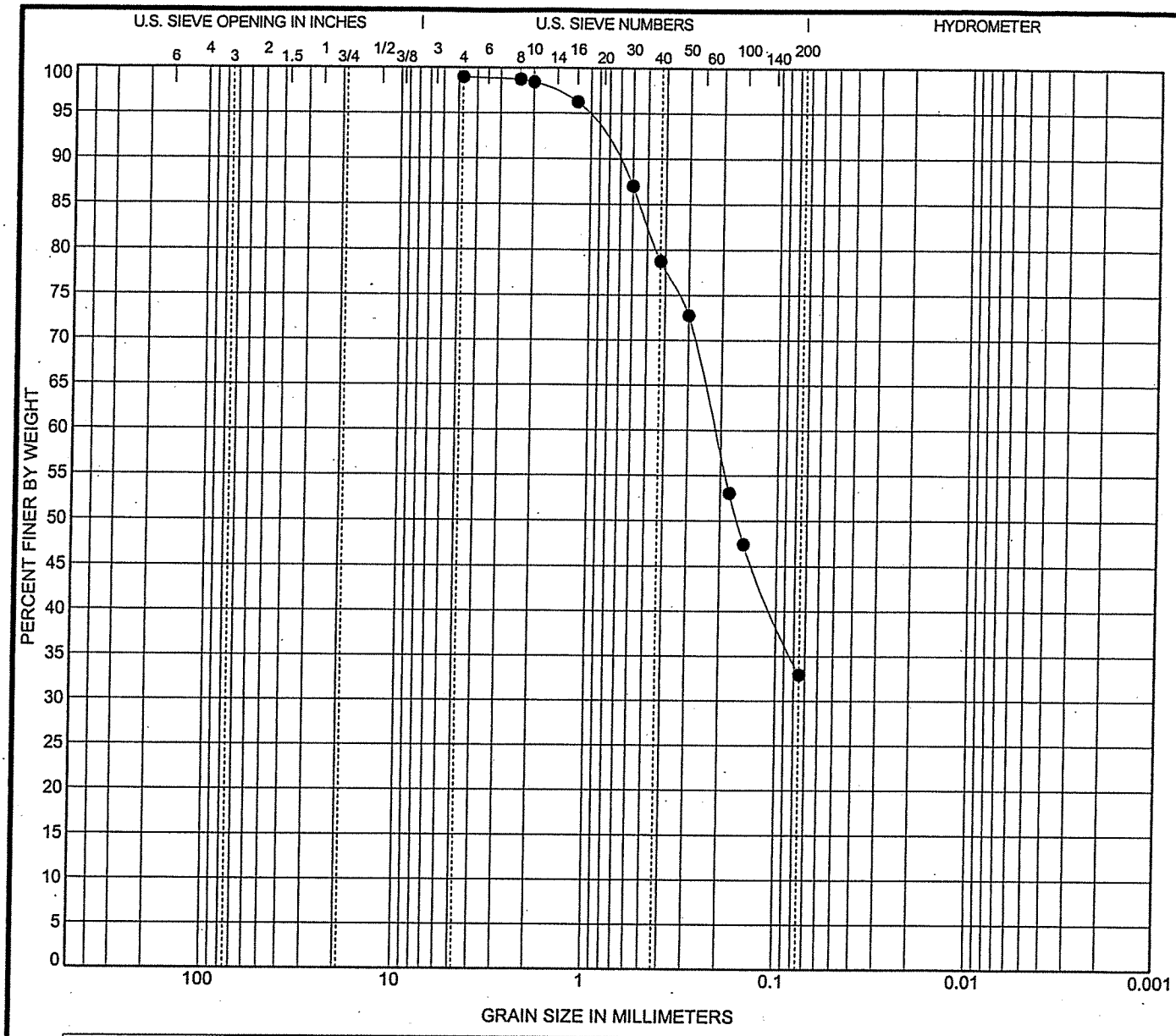
| | Specimen Identification | D100 | D60 | D30 | D10 | %Gravel | %Sand | %Silt | %Clay |
|---|---|---|---|---|---|---|---|---|---|
| ● | 1 2.0ft | **4.75** | **0.313** | **0.092** | | **0.0** | **73.5** | **26.5** | |

Terracon

# GRAIN SIZE DISTRIBUTION

Project: Parcel A- Coyote Creek Subdivision
Site: Fort Lupton, Colorado
Job #: 25025241
Date: 10-29-02

TC GRAIN SIZE 25025241.GPJ TERRACON.GDT 10/29/02




| COBBLES | GRAVEL | | SAND | | | SILT OR CLAY |
|---|---|---|---|---|---|---|
| | coarse | fine | coarse | medium | fine | |

| | Specimen Identification | Classification | LL | PL | PI | Cc | Cu |
|---|---|---|---|---|---|---|---|
| ● | 7 0.0ft | SILTY SAND(SM) | NP | NP | NP | | |

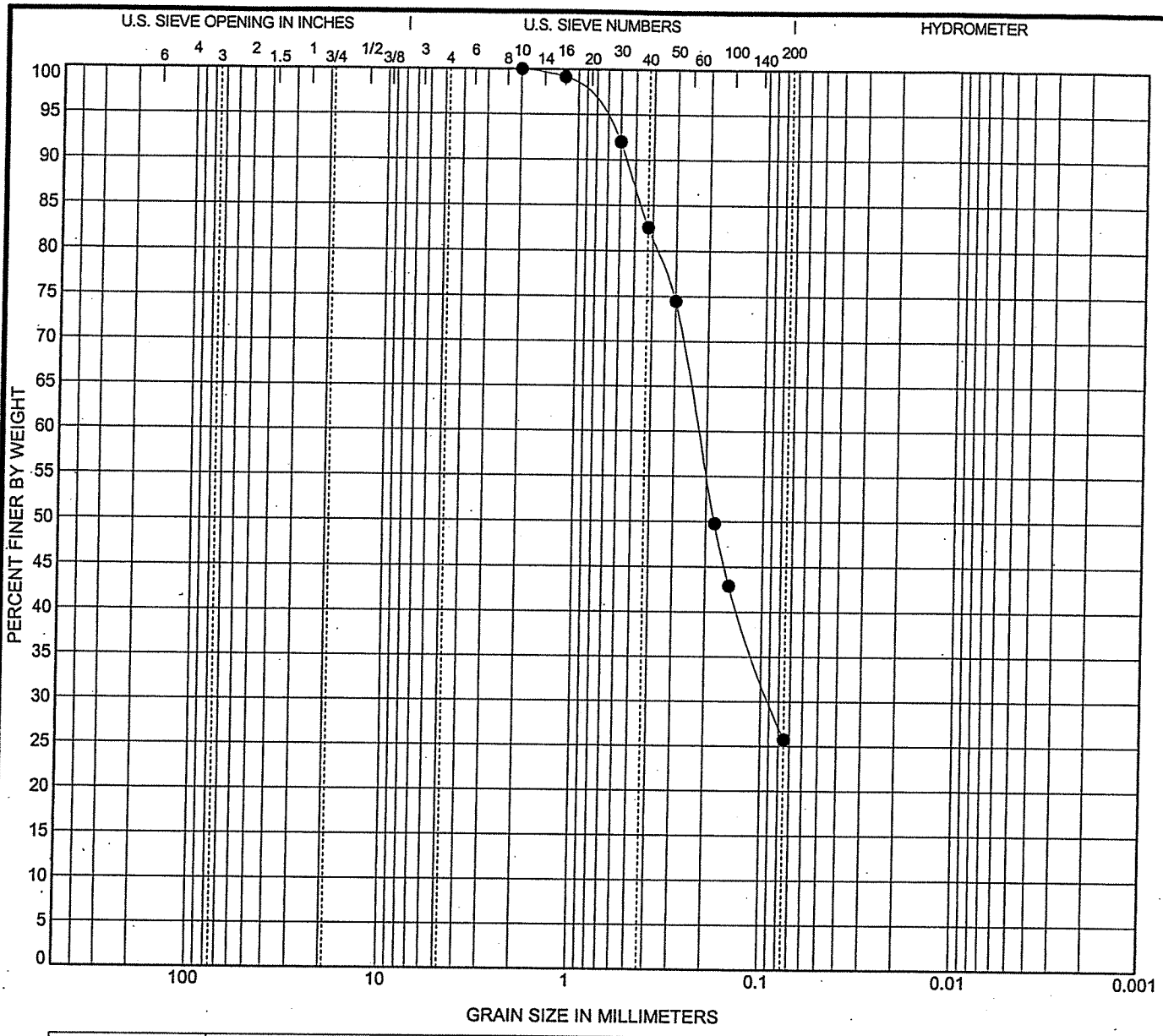
| | Specimen Identification | D100 | D60 | D30 | D10 | %Gravel | %Sand | %Silt | %Clay |
|---|---|---|---|---|---|---|---|---|---|
| ● | 7 0.0ft | 4.75 | 0.216 | | | 0.0 | 66.0 | 32.9 | |

TC GRAIN SIZE 25025241.GPJ TERRACON.GDT 10/29/02

Terracon

## GRAIN SIZE DISTRIBUTION

Project: Parcel A- Coyote Creek Subdivision
Site: Fort Lupton, Colorado
Job #: 25025241
Date: 10-29-02




| COBBLES | GRAVEL | | SAND | | | SILT OR CLAY |
|---|---|---|---|---|---|---|
| | coarse | fine | coarse | medium | fine | |

| | Specimen Identification | Classification | LL | PL | PI | Cc | Cu |
|---|---|---|---|---|---|---|---|
| ● | 7 4.0ft | SILTY SAND(SM) | NP | NP | NP | | |

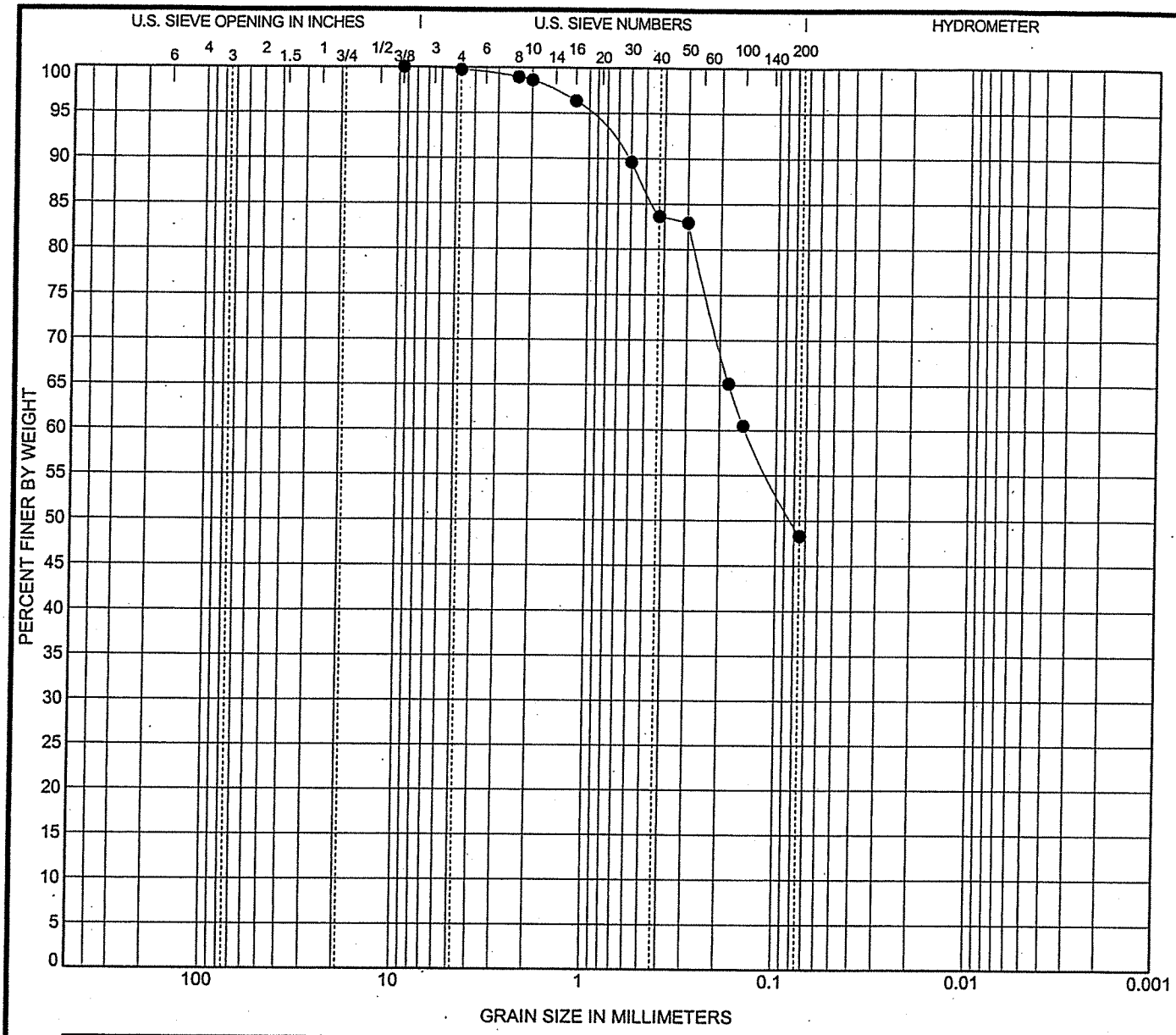
| | Specimen Identification | D100 | D60 | D30 | D10 | %Gravel | %Sand | %Silt | %Clay |
|---|---|---|---|---|---|---|---|---|---|
| ● | 7 4.0ft | 2 | 0.222 | 0.089 | | 0.0 | 74.3 | 25.7 | |

Terracon

# GRAIN SIZE DISTRIBUTION

Project: Parcel A- Coyote Creek Subdivision
Site: Fort Lupton, Colorado
Job #: 25025241
Date: 10-29-02

TC GRAIN SIZE 25025241.GPJ TERRACON.GDT 10/29/02




| COBBLES | GRAVEL | | SAND | | | SILT OR CLAY |
|---|---|---|---|---|---|---|
| | coarse | fine | coarse | medium | fine | |

| | Specimen Identification | Classification | LL | PL | PI | Cc | Cu |
|---|---|---|---|---|---|---|---|
| ● | 9 0.0ft | **CLAYEY SAND(SC)** | **23** | **13** | **10** | | |

| | Specimen Identification | D100 | D60 | D30 | D10 | %Gravel | %Sand | %Silt | %Clay |
|---|---|---|---|---|---|---|---|---|---|
| ● | 9 0.0ft | **9.5** | **0.146** | | | **0.3** | **51.5** | **48.3** | |

Terracon

# GRAIN SIZE DISTRIBUTION

Project: Parcel A- Coyote Creek Subdivision
Site: Fort Lupton, Colorado
Job #: 25025241
Date: 10-29-02



TC GRAIN SIZE 25025241.GPJ TERRACON.GDT 10/29/02

# SOIL PROPERTIES

## PARCEL A – COYOTE CREEK SUBDIVISION – FORT LUPTON, COLORADO

## TERRACON Project No. 25025241

| Boring No. | Depth (ft) | Soil Class. | Soil Property | | Atterberg Limits | | Expansion/Consolidation | | | Shear Strength | | Corrected R-Value | Water Soluble Matter, (mg/l) | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Initial Dry Density (pcf) | Initial Water Content (%) | LL | PI | Surcharge KSF | Expansion (%) | Max. Swell Pressure KSF | C KSF | ϕ Deg | | Salts | Sulfates | |
| 1 | 2 | SM | 105 | 4 | | | | | | | | | | | 4,5 |
| 1 | 4 | SM | 101 | 9 | | | 0.5 | -1.6 | | | | | | | 3,4,5 |
| 2 | 2 | SM | 102 | 2 | | | | | | | | | | | 4,5 |
| 2 | 4 | | 112 | 2 | | | | | | | | | | | 4 |
| 2 | 9 | | 117 | 14 | | | 0.5 | +10.5 | | | | | | | 3,4 |
| 3 | 2 | CL | 102 | 10 | | | | | | | | | | | 4,5 |
| 3 | 4 | | 108 | 11 | | | 0.5 | +2.1 | | | | | | | 3,4 |
| 3 | 9 | | -- | -- | | | | | | | | | | 18 | -- |
| 4 | 2 | CL | 108 | 6 | | | | | | | | | | | 4,5 |
| 4 | 4 | SC | 112 | 6 | | | | | | | | | | | 4,5 |
| 4 | 9 | | 117 | 15 | | | | | | | | | | | 4 |
| 5 | 2 | SM | 117 | 11 | | | | | | | | | | 0 | 4,5 |

* = Partially disturbed sample
- = Compression/settlement
**Note:** Initial Dry Density and Initial Water Content are in-situ values unless otherwise Noted.

**Legend**

Shear Strength Test Method
DS - Direct Shear
DS - Direct Shear (Saturated)
UC - Unconfined Compression
UU - Unconsolidated Undrained
CU - Consolidated Undrained w/pore pressure
CU - Consolidated Undrained
CD - Consolidated Drained

**REMARKS**

1. Compacted density (approximately 95% of ASTM D698 maximum density at moisture content slightly below optimum).
2. Compacted density (approximately 95% of ASTM D1557 maximum density at moisture content slightly below optimum).
3. Submerged to approximate saturation.
4. Dry density determined from one ring of a multi-ring sample.
5. Visual Classification.

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# SOIL PROPERTIES

## PARCEL A – COYOTE CREEK SUBDIVISION – FORT LUPTON, COLORADO

## TERRACON Project No. 25025241

| Boring No. | Depth (ft) | Soil Class. | Soil Property | | Atterberg Limits | | Expansion/Consolidation | | | Shear Strength | | Corrected R-Value | Water Soluble Matter, (mg/l) | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Initial Dry Density (pcf) | Initial Water Content (%) | LL | PI | Surcharge KSF | Expansion (%) | Max. Swell Pressure KSF | C KSF | ϕ Deg | | Salts | Sulfates | |
| 5 | 4 | | 116 | 15 | | | | | | | | | | | 4 |
| 6 | 2 | SM | 112 | 9 | | | 0.5 | -0.6 | | | | | | | 3,4,5 |
| 6 | 4 | | 104 | 11 | | | | | | | | | | | 4 |
| 6 | 9 | | 103 | 22 | | | | | | | | | | | 4 |
| 7 | 2 | SM | 102 | 4 | | | | | | | | | | | 4,5 |
| 7 | 4 | SM | 108 | 3 | | | | | | | | | | | 4,5 |
| 7 | 9 | | 116 | 16 | | | 0.5 | +3.0 | | | | | | | 3,4 |
| 8 | 2 | CL | 89 | 14 | | | | | | | | | | | 4,5 |
| 8 | 4 | | 104 | 14 | | | 0.5 | +4.9 | | | | | | | 3,4 |
| 9 | 2 | SC | 85 | 15 | | | | | | | | | | 410 | 4,5 |
| 9 | 4 | | 98 | 18 | | | 0.5 | +4.4 | | | | | | | 3,4 |
| 10 | 2 | ML | 99 | 7 | | | | | | | | | | | 4,5 |

* = Partially disturbed sample
- = Compression/settlement
**Note:** Initial Dry Density and Initial Water Content are in-situ values unless otherwise Noted.

**Legend**

Shear Strength Test Method
DS - Direct Shear
DS - Direct Shear (Saturated)
UC - Unconfined Compression
UU - Unconsolidated Undrained
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**REMARKS**

1. Compacted density (approximately 95% of ASTM D698 maximum density at moisture content slightly below optimum).
2. Compacted density (approximately 95% of ASTM D1557 maximum density at moisture content slightly below optimum).
3. Submerged to approximate saturation.
4. Dry density determined from one ring of a multi-ring sample.
5. Visual Classification.

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# SOIL PROPERTIES

## PARCEL A – COYOTE CREEK SUBDIVISION – FORT LUPTON, COLORADO

## TERRACON Project No. 25025241

| Boring No. | Depth (ft) | Soil Class. | Soil Property | | Atterberg Limits | | Expansion/Consolidation | | | Shear Strength | | Corrected R-Value | Water Soluble Matter, (mg/l) | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Initial Dry Density (pcf) | Initial Water Content (%) | LL | PI | Surcharge KSF | Expansion (%) | Max. Swell Pressure KSF | C KSF | ϕ Deg | | Salts | Sulfates | |
| 10 | 4 | SM | -- | 1.0 | | | | | | | | | | | 5 |
| 10 | 9 | | 112 | 18 | | | 0.5 | +4.4 | | | | | | | 3,4 |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | |

* = Partially disturbed sample
- = Compression/settlement
**Note:** Initial Dry Density and Initial Water Content are in-situ values unless otherwise Noted.

**Legend**

Shear Strength Test Method
DS - Direct Shear
DS - Direct Shear (Saturated)
UC - Unconfined Compression
UU - Unconsolidated Undrained
CU - Consolidated Undrained w/pore pressure
CU - Consolidated Undrained
CD - Consolidated Drained

**REMARKS**

1. Compacted density (approximately 95% of ASTM D698 maximum density at moisture content slightly below optimum).
2. Compacted density (approximately 95% of ASTM D1557 maximum density at moisture content slightly below optimum).
3. Submerged to approximate saturation.
4. Dry density determined from one ring of a multi-ring sample.
5. Visual Classification.

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# PHYSICAL PROPERTIES

## PARCEL A – COYOTE CREEK SUBDIVISION – FORT LUPTON, COLORADO

## TERRACON Project No. 25025241

| Boring No. | Depth (ft) | Soil Class. | Particle Size Distribution, % Passing by Weight | | | | | Atterberg Limits | | Moisture-Density Relationship | | | Specific Gravity | Permeability | | Corrected R-Value | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 3" | #4 | #10 | #40 | #200 | LL | PI | Dry Density (pcf) | Optimum Moisture (%) | Method | | Dry Density (pcf) | K Cm/Sec | | |
| 1 | 2 | A-2-4 (0) SM | | 100 | 99 | 70 | 26 | NV | NP | | | | | | | | 2 |
| 2 | 9 | A-7-6 (33) CH | | | | | 88 | 51 | 36 | | | | | | | | 3 |
| 3 | 2 | A-6 (11) CL | | | | | 63 | 36 | 22 | | | | | | | | 3 |
| 7 | 0-7 | A-2-4 (0) SM | 100 | 99 | 98 | 79 | 33 | NV | NP | | | | | | | | 2 |
| 7 | 4 | A-2-4 (0) SM | | | 100 | 83 | 26 | NV | NP | | | | | | | | 2 |
| 7 | 9 | A-7-6 (25) CL | | | | | 89 | 43 | 28 | | | | | | | | 3 |
| 8 | 0-3-1/2 | A-4 (1) CL | | | | | 53 | 22 | 8 | | | | | | | | 3 |
| 9 | 0-4 | A-6 (2) SC | | 100 | 99 | 84 | 48 | 24 | 11 | | | | | | | | 2 |
| 10 | 2 | A-4 (0) ML | | | | | 54 | NV | NP | | | | | | | | 3 |
| 10 | 4 | A-2-4 (0) SM | | | 100 | 99 | 19 | NV | NP | | | | | | | | 2 |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |

**REMARKS:**

**Classification/Particle Size**
1. Visual
2. Laboratory Tested
3. Minus #200 Only

**Note:** NP = non-plastic

**Moisture-Density Relationship**
4. Tested ASTM D698/AASHTO T99
5. Tested ASTM D1577/AASHTO T180

**Specific Gravity**
6. Minus #4
7. Plus #4

**Permeability**
8. Constant Head
9. Falling Head

**R-Value**
10. Expansion Pressure ____ psf
11. Exudation Pressure 300 psi



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# GENERAL NOTES

**DRILLING & SAMPLING SYMBOLS:**

| | | | |
|---|---|---|---|
| SS: | Split Spoon - 1-3/8" I.D., 2" O.D., unless otherwise noted | HS: | Hollow Stem Auger |
| ST: | Thin-Walled Tube - 2" O.D., unless otherwise noted | PA: | Power Auger |
| RS: | Ring Sampler - 2.42" I.D., 3" O.D., unless otherwise noted | HA: | Hand Auger |
| DB: | Diamond Bit Coring - 4", N, B | RB: | Rock Bit |
| BS: | Bulk Sample or Auger Sample | WB: | Wash Boring or Mud Rotary |

The number of blows required to advance a standard 2-inch O.D. split-spoon sampler (SS) the last 12 inches of the total 18-inch penetration with a 140-pound hammer falling 30 inches is considered the "Standard Penetration" or "N-value". For 3" O.D. ring samplers (RS) the penetration value is reported as the number of blows required to advance the sampler 12 inches using a 140-pound hammer falling 30 inches, reported as "blows per foot," and is not considered equivalent to the "Standard Penetration" or "N-value".

**WATER LEVEL MEASUREMENT SYMBOLS:**

| | | | |
|---|---|---|---|
| WL: | Water Level | WS: | While Sampling |
| WCI: | Wet Cave in | WD: | While Drilling |
| DCI: | Dry Cave in | BCR: | Before Casing Removal |
| AB: | After Boring | ACR: | After Casing Removal |

Water levels indicated on the boring logs are the levels measured in the borings at the times indicated. Groundwater levels at other times and other locations across the site could vary. In pervious soils, the indicated levels may reflect the location of groundwater. In low permeability soils, the accurate determination of groundwater levels may not be possible with only short-term observations.

**DESCRIPTIVE SOIL CLASSIFICATION:** Soil classification is based on the Unified Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are principally described as clays if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

| FINE-GRAINED SOILS | | | COARSE-GRAINED SOILS | | | BEDROCK | | |
|---|---|---|---|---|---|---|---|---|
| (RS) Blows/Ft. | (SS) Blows/Ft. | Consistency | (RS) Blows/Ft. | (SS) Blows/Ft. | Relative Density | (RS) Blows/Ft. | (SS) Blows/Ft. | Consistency |
| < 3 | < 2 | Very Soft | 0-6 | < 3 | Very Loose | < 30 | < 20 | Weathered |
| 3-4 | 2-3 | Soft | 7-18 | 4-9 | Loose | 30-49 | 20-29 | Firm |
| 5-9 | 4-6 | Medium Stiff | 19-58 | 10-29 | Medium Dense | 50-89 | 30-49 | Medium Hard |
| 10-18 | 7-12 | Stiff | 59-98 | 30-49 | Dense | 90-119 | 50-79 | Hard |
| 19-42 | 13-26 | Very Stiff | > 98 | > 49 | Very Dense | > 119 | > 79 | Very Hard |
| > 42 | > 26 | Hard | | | | | | |

**RELATIVE PROPORTIONS OF SAND AND GRAVEL**

| Descriptive Terms of Other Constituents | Percent of Dry Weight |
|---|---|
| Trace | < 15 |
| With | 15 – 29 |
| Modifier | > 30 |

**GRAIN SIZE TERMINOLOGY**

| Major Component of Sample | Particle Size |
|---|---|
| Boulders | Over 12 in. (300mm) |
| Cobbles | 12 in. to 3 in. (300mm to 75 mm) |
| Gravel | 3 in. to #4 sieve (75mm to 4.75 mm) |
| Sand | #4 to #200 sieve (4.75mm to 0.075mm) |
| Silt or Clay | Passing #200 Sieve (0.075mm) |

**RELATIVE PROPORTIONS OF FINES**

| Descriptive Terms of Other Constituents | Percent of Dry Weight |
|---|---|
| Trace | < 5 |
| With | 5 – 12 |
| Modifiers | > 12 |

**PLASTICITY DESCRIPTION**

| Term | Plasticity Index |
|---|---|
| Non-plastic | 0 |
| Low | 1-10 |
| Medium | 11-30 |
| High | 30+ |

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# UNIFIED SOIL CLASSIFICATION SYSTEM

| Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests[A] | | | | | Soil Classification | |
|---|---|---|---|---|---|---|
| | | | | | Group Symbol | Group Name[B] |
| Coarse Grained Soils More than 50% retained on No. 200 sieve | Gravels More than 50% of coarse fraction retained on No. 4 sieve | Clean Gravels Less than 5% fines[C] | $Cu \geq 4$ and $1 \leq Cc \leq 3$[E] | | GW | Well graded gravel[F] |
| | | | $Cu < 4$ and/or $1 > Cc > 3$[E] | | GP | Poorly graded gravel[F] |
| | | Gravels with Fines More than 12% fines[C] | Fines classify as ML or MH | | GM | Silty gravel[F,G,H] |
| | | | Fines classify as CL or CH | | GC | Clayey gravel[F,G,H] |
| | Sands 50% or more of coarse fraction passes No. 4 sieve | Clean Sands Less than 5% fines[D] | $Cu \geq 6$ and $1 \leq Cc \leq 3$[E] | | SW | Well graded sand[I] |
| | | | $Cu < 6$ and/or $1 > Cc > 3$[E] | | SP | Poorly graded sand[I] |
| | | Sands with Fines More than 12% fines[D] | Fines classify as ML or MH | | SM | Silty sand[G,H,I] |
| | | | Fines classify as CL or CH | | SC | Clayey sand[G,H,I] |
| Fine-Grained Soils 50% or more passes the No. 200 sieve | Silts and Clays Liquid limit less than 50 | inorganic | PI > 7 and plots on or above "A" line[J] | | CL | Lean clay[K,L,M] |
| | | | PI < 4 or plots below "A" line[J] | | ML | Silt[K,L,M] |
| | | organic | Liquid limit - oven dried / Liquid limit - not dried | < 0.75 | OL | Organic clay[K,L,M,N] / Organic silt[K,L,M,O] |
| | Silts and Clays Liquid limit 50 or more | inorganic | PI plots on or above "A" line | | CH | Fat clay[K,L,M] |
| | | | PI plots below "A" line | | MH | Elastic silt[K,L,M] |
| | | organic | Liquid limit - oven dried / Liquid limit - not dried | < 0.75 | OH | Organic clay[K,L,M,P] / Organic silt[K,L,M,Q] |
| Highly organic soils | Primarily organic matter, dark in color, and organic odor | | | | PT | Peat |

[A] Based on the material passing the 3-in. (75-mm) sieve

[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well graded gravel with silt, GW-GC well graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

[D] Sands with 5 to 12% fines require dual symbols: SW-SM well graded sand with silt, SW-SC well graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay

[E] $Cu = D_{60}/D_{10}$ $\quad Cc = \dfrac{(D_{30})^2}{D_{10} \times D_{60}}$

[F] If soil contains ≥ 15% sand, add "with sand" to group name.

[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

[H] If fines are organic, add "with organic fines" to group name.

[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.

[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.

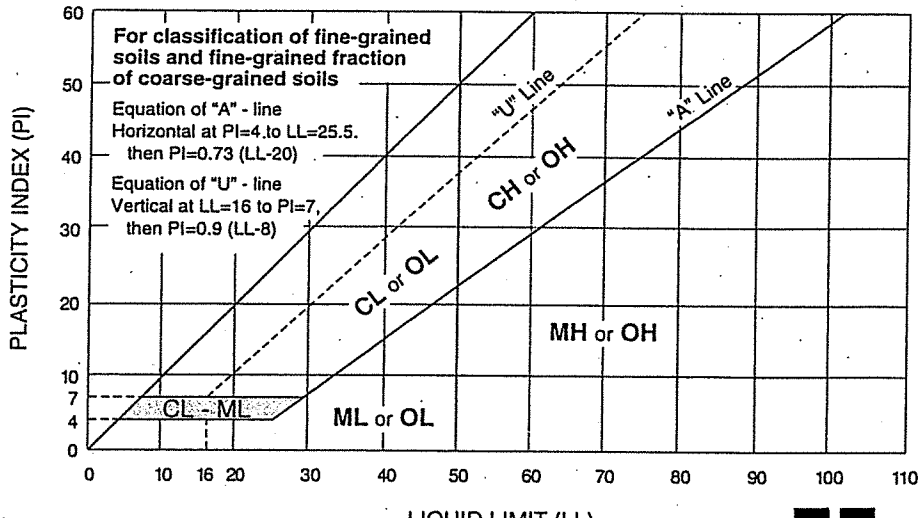
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.

[N] PI ≥ 4 and plots on or above "A" line.

[O] PI < 4 or plots below "A" line.

[P] PI plots on or above "A" line.

[Q] PI plots below "A" line.



# ROCK CLASSIFICATION
**(Based on ASTM C-294)**

## Sedimentary Rocks

Sedimentary rocks are stratified materials laid down by water or wind. The sediments may be composed of particles or pre-existing rocks derived by mechanical weathering, evaporation or by chemical or organic origin. The sediments are usually indurated by cementation or compaction.

**Chert** — Very fine-grained siliceous rock composed of micro-crystalline or cyrptocrystalline quartz, chalcedony or opal. Chert is various colored, porous to dense, hard and has a conchoidal to splintery fracture.

**Claystone** — Fine-grained rock composed of or derived by erosion of silts and clays or any rock containing clay. Soft massive and may contain carbonate minerals.

**Conglomerate** — Rock consisting of a considerable amount of rounded gravel, sand and cobbles with or without interstitial or cementing material. The cementing or interstitial material may be quartz, opal, calcite, dolomite, clay, iron oxides or other materials.

**Dolomite** — A fine-grained carbonate rock consisting of the mineral dolomite [$CaMg(CO_3)_2$]. May contain noncarbonate impurities such as quartz, chert, clay minerals, organic matter, gypsum and sulfides. Reacts with hydrochloric acid (HCL).

**Limestone** — A fine-grained carbonate rock consisting of the mineral calcite ($CaCO_3$). May contain noncarbonate impurities such as quartz, chert, clay minerals, organic matter, gypsum and sulfides. Reacts with hydrochloric acid (HCL).

**Sandstone** — Rock consisting of particles of sand with or without interstitial and cementing materials. The cementing or interstitial material may be quartz, opal, calcite, dolomite, clay, iron oxides or other material.

**Shale** — Fine-grained rock composed of or derived by erosion of silts and clays or any rock containing clay. Shale is hard, platy, of fissile may be gray, black, reddish or green and may contain some carbonate minerals (calcareous shale).

**Siltstone** — Fine grained rock composed of or derived by erosion of silts or rock containing silt. Siltstones consist predominantly of silt sized particles (0.0625 to 0.002 mm in diameter) and are intermediate rocks between claystones and sandstones and may contain carbonate minerals.

# ROCK CLASSIFICATION
**(Based on ASTM C-294)**

## Metamorphic Rocks

Metamorphic rocks form from igneous, sedimentary, or pre-existing metamorphic rocks in response to changes in chemical and physical conditions occurring within the earth's crust after formation of the original rock. The changes may be textural, structural, or mineralogic and may be accompanied by changes in chemical composition. The rocks are dense and may be massive but are more frequently foliated (laminated or layered) and tend to break into platy particles. The mineral composition is very variable depending in part on the degree of metamorphism and in part on the composition of the original rock.

**Marble** — A recrystallized medium- to coarse-grained carbonate rock composed of calcite or dolomite, or calcite and dolomite. The original impurities are present in the form of new minerals, such as micas, amphiboles, pyroxenes, and graphite.

**Metaquartzite** — A granular rock consisting essentially of recrystallized quartz. Its strength and resistance to weathering derive from the interlocking of the quartz grains.

**Slate** — A fine-grained metamorphic rock that is distinctly laminated and tends to split into thin parallel layers. The mineral composition usually cannot be determined with the unaided eye.

**Schist** — A highly layered rock tending to split into nearly parallel planes (schistose) in which the grain is coarse enough to permit identification of the principal minerals. Schists are subdivided into varieties on the basis of the most prominent mineral present in addition to quartz or to quartz and feldspars; for instance, mica schist. Greenschist is a green schistose rock whose color is due to abundance of one or more of the green minerals, chlorite or amphibole, and is commonly derived from altered volcanic rock.

**Gneiss** — One of the most common metamorphic rocks, usually formed from igneous or sedimentary rocks by a higher degree of metamorphism than the schists. It is characterized by a layered or foliated structure resulting from approximately parallel lenses and bands of platy minerals, usually micas or prisms, usually amphiboles, and of granular minerals, usually quartz and feldspars. All intermediate varieties between gneiss and schist and between gneiss and granite are often found in the same areas in which well-defined gneisses occur.

# ROCK CLASSIFICATION
**(Based on ASTM C-294)**

## Igneous Rocks

Igneous rocks are formed by cooling from a molten rock mass (magma). Igneous rocks are divided into two classes (1) plutonic, or intrusive, that have cooled slowly within the earth; and (2) volcanic, or extrusive, that formed from quickly cooled lavas. Plutonic rocks have grain sizes greater than approximately 1 mm, and are classified as coarse- or medium-grained. Volcanic rocks have grain sizes less than approximately 1 mm, and are classified as fine-grained. Volcanic rocks frequently contain glass. Both plutonic and volcanic rocks may consist of porphyries that are characterized by the presence of large mineral grains in a fine-grained or glassy groundmass. This is the result of sharp changes in rate of cooling or other physico-chemical conditions during solidification of the melt.

**Granite**

Granite is a medium- to coarse-grained light-colored rock characterized by the presence of potassium feldspar with lesser amounts of plagioclase feldspars and quartz. The characteristic potassium feldspars are othoclase or microcline, or both; the common plagioclase feldspars are albite and oligoclase. Feldspars are more abundant than quartz. Dark-colored mica (biotite) is usually present, and light-colored mica (muscovite) is frequently present. Other dark-colored ferromagnesian minerals, especially honblende, may be present in amounts less than those of the light-colored constituents.

**Quartz-Monzonite and Grano-Diorite**

Rocks similar to granite but contain more plagioclase feldspar than potassium feldspar.

**Basalt**

Fine-grained extrusive equivalent of gabbro and diabase. When basalt contains natural glass, the glass is generally lower in silica content than that of the lighter-colored extrusive rocks.

## LABORATORY TEST
## SIGNIFICANCE AND PURPOSE

| TEST | SIGNIFICANCE | PURPOSE |
|---|---|---|
| *California Bearing Ratio* | Used to evaluate the potential strength of subgrade soil, subbase, and base course material, including recycled materials for use in road and airfield pavements. | *Pavement Thickness Design* |
| *Consolidation* | Used to develop an estimate of both the rate and amount of both differential and total settlement of a structure. | *Foundation Design* |
| *Direct Shear* | Used to determine the consolidated drained shear strength of soil or rock. | *Bearing Capacity, Foundation Design, and Slope Stability* |
| *Dry Density* | Used to determine the in-place density of natural, inorganic, fine-grained soils. | *Index Property Soil Behavior* |
| *Expansion* | Used to measure the expansive potential of fine-grained soil and to provide a basis for swell potential classification. | *Foundation and Slab Design* |
| *Gradation* | Used for the quantitative determination of the distribution of particle sizes in soil. | *Soil Classification* |
| *Liquid & Plastic Limit, Plasticity Index* | Used as an integral part of engineering classification systems to characterize the fine-grained fraction of soils, and to specify the fine-grained fraction of construction materials. | *Soil Classification* |
| *Permeability* | Used to determine the capacity of soil or rock to conduct a liquid or gas. | *Groundwater Flow Analysis* |
| *pH* | Used to determine the degree of acidity or alkalinity of a soil. | *Corrosion Potential* |
| *Resistivity* | Used to indicate the relative ability of a soil medium to carry electrical currents. | *Corrosion Potential* |
| *R-Value* | Used to evaluate the potential strength of subgrade soil, subbase, and base course material, including recycled materials for use in road and airfield pavements. | *Pavement Thickness Design* |
| *Soluble Sulphate* | Used to determine the quantitative amount of soluble sulfates within a soil mass. | *Corrosion Potential* |
| *Unconfined Compression* | To obtain the approximate compressive strength of soils that possess sufficient cohesion to permit testing in the unconfined state. | *Bearing Capacity Analysis for Foundations* |
| *Water Content* | Used to determine the quantitative amount of water in a soil mass. | *Index Property Soil Behavior* |

## REPORT TERMINOLOGY
## (Based on ASTM D653)

| | |
|---|---|
| *Allowable Soil Bearing Capacity* | The recommended maximum contact stress developed at the interface of the foundation element and the supporting material. |
| *Alluvium* | Soil, the constituents of which have been transported in suspension by flowing water and subsequently deposited by sedimentation. |
| *Aggregate Base Course* | A layer of specified material placed on a subgrade or subbase usually beneath slabs or pavements. |
| *Backfill* | A specified material placed and compacted in a confined area. |
| *Bedrock* | A natural aggregate of mineral grains connected by strong and permanent cohesive forces. Usually requires drilling, wedging, blasting or other methods of extraordinary force for excavation. |
| *Bench* | A horizontal surface in a sloped deposit. |
| *Caisson (Drilled Pier or Shaft)* | A concrete foundation element cast in a circular excavation which may have an enlarged base. Sometimes referred to as a cast-in-place pier or drilled shaft. |
| *Coefficient of Friction* | A constant proportionality factor relating normal stress and the corresponding shear stress at which sliding starts between the two surfaces. |
| *Colluvium* | Soil, the constituents of which have been deposited chiefly by gravity such as at the foot of a slope or cliff. |
| *Compaction* | The densification of a soil by means of mechanical manipulation |
| *Concrete Slab-on-Grade* | A concrete surface layer cast directly upon a base, subbase or subgrade, and typically used as a floor system. |
| *Differential Movement* | Unequal settlement or heave between, or within foundation elements of structure. |
| *Earth Pressure* | The pressure exerted by soil on any boundary such as a foundation wall. |
| *ESAL* | Equivalent Single Axle Load, a criteria used to convert traffic to a uniform standard, (18,000 pound axle loads). |
| *Engineered Fill* | Specified material placed and compacted to specified density and/or moisture conditions under observations of a representative of a geotechnical engineer. |
| *Equivalent Fluid* | A hypothetical fluid having a unit weight such that it will produce a pressure against a lateral support presumed to be equivalent to that produced by the actual soil. This simplified approach is valid only when deformation conditions are such that the pressure increases linearly with depth and the wall friction is neglected. |
| *Existing Fill (or Man-Made Fill)* | Materials deposited throughout the action of man prior to exploration of the site. |
| *Existing Grade* | The ground surface at the time of field exploration. |

## REPORT TERMINOLOGY
## (Based on ASTM D653)

| | |
|---|---|
| ***Expansive Potential*** | The potential of a soil to expand (increase in volume) due to absorption of moisture. |
| ***Finished Grade*** | The final grade created as a part of the project. |
| ***Footing*** | A portion of the foundation of a structure that transmits loads directly to the soil. |
| ***Foundation*** | The lower part of a structure that transmits the loads to the soil or bedrock. |
| ***Frost Depth*** | The depth at which the ground becomes frozen during the winter season. |
| ***Grade Beam*** | A foundation element or wall, typically constructed of reinforced concrete, used to span between other foundation elements such as drilled piers. |
| ***Groundwater*** | Subsurface water found in the zone of saturation of soils or within fractures in bedrock. |
| ***Heave*** | Upward movement. |
| ***Lithologic*** | The characteristics which describe the composition and texture of soil and rock by observation. |
| ***Native Grade*** | The naturally occurring ground surface. |
| ***Native Soil*** | Naturally occurring on-site soil, sometimes referred to as natural soil. |
| ***Optimum Moisture Content*** | The water content at which a soil can be compacted to a maximum dry unit weight by a given compactive effort. |
| ***Perched Water*** | Groundwater, usually of limited area maintained above a normal water elevation by the presence of an intervening relatively impervious continuous stratum. |
| ***Scarify*** | To mechanically loosen soil or break down existing soil structure. |
| ***Settlement*** | Downward movement. |
| ***Skin Friction (Side Shear)*** | The frictional resistance developed between soil and an element of the structure such as a drilled pier. |
| ***Soil (Earth)*** | Sediments or other unconsolidated accumulations of solid particles produced by the physical and chemical disintegration of rocks, and which may or may not contain organic matter. |
| ***Strain*** | The change in length per unit of length in a given direction. |
| ***Stress*** | The force per unit area acting within a soil mass. |
| ***Strip*** | To remove from present location. |
| ***Subbase*** | A layer of specified material in a pavement system between the subgrade and base course. |
| ***Subgrade*** | The soil prepared and compacted to support a structure, slab or pavement system. |

# COYOTE CREEK FILING NO. 4
# FINAL UTILITY STUDY

December 2021

Prepared For:
**Lupton Land, LLC**
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(Project No. 16093.00)

# Table of Contents

CERTIFICATION STATEMENT ..... ii
I. INTRODUCTION ..... 1
Project Location and Description ..... 1
II. POTABLE WATER SYSTEM ..... 2
Existing System and Proposed System ..... 2
Calculated Potable Water Demands and Design Flow Requirements ..... 2
Hydraulic Analysis ..... 3
Conclusions ..... 3
III. NON-POTABLE WATER SYSTEM ..... 4
Existing and Proposed System ..... 4
Calculated Non-Potable Water Demands and Design Flow Requirements ..... 4
Hydraulic Analysis ..... 5
Conclusions ..... 5
IV. SANITARY SEWER SYSTEM ..... 6
Existing and Proposed System ..... 6
Calculated Wastewater Flows and Design Flow Requirements ..... 6
Hydraulic Analysis ..... 7
Conclusions ..... 7
V. CONCLUSION ..... 8
VI. REFERENCES ..... 8

## Appendices

A: Vicinity Map
B: Potable Water Demand Table, Model Map, WaterCAD Map & Results
C: Non-Potable Water Demand Table, Model Map, WaterCAD Map & Results
D: Sanitary Sewer Loading, Basin Map, FlowMaster Results

# CERTIFICATION STATEMENT

This Utility Report for the design of the Coyote Creek Filing No. 4 development was prepared by me or under my direct supervision in accordance with the City of Fort Lupton's Standards and Specifications and acceptable professional practices of the industry. We acknowledge that the City of Fort Lupton's review of this Utility Study is only for general conformance with submittal requirements, current design criteria and standard engineering principles and practices. We are also aware of the provisions of the City Code of the City of Fort Lupton.

_____

Andrew J. Hugill, Registered Professional Engineer
Colorado Professional Engineer No. 57007
For and on behalf of JR Engineering, LLC

# I. INTRODUCTION

## Project Location and Description

Coyote Creek Filing No. 4 is a proposed single-family residential Planned Unit Development (PUD) located within Section 5, Township 1 North, Range 66 West of the 6th Principal Meridian, City of Fort Lupton, Weld County, Colorado.

The approximately 13-acre site is bounded by the Shortline Ditch regional channel to the west, Twombly Elementary School to the north, and Coyote Creek Golf Course to the southeast. A vicinity map is included in Appendix A.

This report presents the utility system analysis for the potable water, non-potable water, and sanitary sewer systems for Coyote Creek Filing No. 4.

# II. POTABLE WATER SYSTEM

## Existing System and Proposed System

Potable water for Coyote Creek Filing No. 4 will be supplied by the City of Fort Lupton. There is an existing 18" high-pressure potable water mainline within 9th Street, and an existing 12" potable water mainline within 4th Street with an 8" stub north into the site.

An 8" proposed waterline will connect to the 18" potable water mainline in 9th Street by means of a PRV and will continue south along the existing road west of Twombly Elementary School. An 8" and 12" waterline will loop through the proposed development and connect with the existing 12" water mainline in 4th Street. A non-potable water interconnect is proposed on the potable waterline within Lupton Lane. A map of the existing and proposed potable water system is included in Appendix B.

## Calculated Potable Water Demands and Design Flow Requirements

The basis of the design for this study was set forth in Chapter 3 of the City of Fort Lupton *Standards and Specifications for the Design and Construction of Public Improvements*, 2014. The following is a summary of the applicable criteria for Coyote Creek Filing No. 4, a single-family detached residential development:

Criteria for Establishing Potable Water Demands

| Zoning | Type of Development | People per Unit | Per Capita Demand |
|---|---|---|---|
| R-1 to R-5 | Single Family Detached | 2.62 | 200 gallons |

Maximum Day Factor 2.5
Peak Hour Factor 4.0

Criteria for Operating Pressures and Sizing of Mains

| | Minimum Pressure | Maximum Head Loss | Maximum Velocity | Hazen-Williams "C" Coefficient |
|---|---|---|---|---|
| Peak Hour Demand | 50 psi | 2 ft/1000 ft | 5 ft/s | 130 |
| Maximum Day Demand + Fire Flow | 20 psi | N/A | 7 ft/s | |

Fire Flow Demand

Single Family Detached* 1,500 gpm

*Per IFC Table B105.1(2) for assumed Type V-B and total building area < 3,600 SF

The total potable water demand for Coyote Creek Filing No. 4 is shown **Table 1** below.

**Table 1: Coyote Creek Filing No. 4 Total Potable Demand Summary Table**

| Dwelling Units | Unit Demand (gpd/DU) | Average Day Demand (gpd) | Maximum Day Demand (gpd) | Peak Hour Demand (gpd) |
|---|---|---|---|---|
| 59 | 524 | 30,916 | 77,290 | 123,664 |

A non-potable water interconnect is proposed on the potable waterline within Lupton Lane. The total non-potable interconnect maximum day demand is 24,256 gpd, and the peak-hour demand is 38,809 gpd. The interconnect demand corresponds to the amount of water drawn out of interconnect reservoir, which is fed by the potable water system, to supply the non-potable water network in the event that the non-potable system is down. The demands for each modeled junction within Coyote Creek Filing No. 4 are shown in Appendix B.

## Hydraulic Analysis

Bentley's WaterCAD V.8 was used to model and analyze the proposed potable water distribution system. Using the flow pressure test results supplied by the City, HGLs of 5132' and 5095' were applied to the boundary conditions at 4$^{th}$ Street and 9$^{th}$ Street, respectively. The following assumptions were used in developing the WaterCAD model:

- There is an unlimited water supply, provided to the site from the two connection points to the existing water lines in 4$^{th}$ Street and 9$^{th}$ Street.
- Water demand for the each proposed residential lot is taken at the node nearest the center of the lot.
- Existing and proposed water lines are assumed to be 5' in depth.

WaterCAD scenarios were set up to analyze maximum hour demand plus peak irrigation flow, and maximum daily demand plus peak irrigation flow and fire flow. A separate scenario was run for each of the three proposed hydrant locations.

The design of the water distribution system is based on the maximum daily demand plus peak irrigation flow and fire flow scenarios, which were the higher demand scenarios compared to the maximum hour demand plus peak irrigation flow scenario. In order to keep maximum daily demand plus fire flow velocities below 7 ft/s, the 8" stub off of the waterline in 4$^{th}$ Street cannot be utilized and a 12" connection is being proposed instead. Results of the hydraulic analysis and a map of the WaterCAD pipes and nodes are included in Appendix B.

## Conclusions

This study presents the results of the analysis performed for the potable water system associated with the proposed Coyote Creek Filing No. 4 development. The design and layout of the potable water system as shown and discussed in this study and in the Appendices conform to the Fort Lupton design standards and requirements for fire protection, minimum pressures and maximum velocities.

# III. NON-POTABLE WATER SYSTEM

## Existing and Proposed System

Non-potable water for the Coyote Creek Filing No. 4 development will be supplied by the City of Fort Lupton via an existing 30" non-potable waterline that bisects the Filing No. 4 site.

A 4" non-potable waterline is proposed to loop through the Filing No. 4 development and connect to the existing 30" non-potable waterline through a metered tap on the southeast corner of the site. A potable water interconnect is also proposed within Lupton Lane. A map of the existing and proposed non-potable water system is included in Appendix C.

## Calculated Non-Potable Water Demands and Design Flow Requirements

The basis of design for this study was set forth in Chapter 3 of the City of Fort Lupton *Standards and Specifications for the Design and Construction of Public Improvements,* 2014. The following is a summary of the applicable water system criteria and assumed parameters used to establish the non-potable water demand and design:

| Land Use | Assumed Percentage of Total Area to be Irrigated | Average Day Demand* |
|---|---|---|
| Single-Family Residential | 45% | 1.55 gpm/acre |
| Park | 75% | |

*Established using the SACWSD Design Standards and Criteria

| | |
|---|---|
| Maximum Day Factor | 2.5 |
| Peak Hour Factor | 4.0 |

Criteria for Operating Pressures and Sizing of Mains

| | Minimum Pressure | Maximum Head Loss | Maximum Velocity | Hazen-Williams "C" Coefficient |
|---|---|---|---|---|
| Peak Hour Demand and Maximum Day Demand | 50 psi | 2 ft/1000 ft | 5 ft/s | 130 |

Coyote Creek Filing No. 4 is comprised of 59 single-family detached residential lots, with 41 lots sized 50'x105' and 18 lots sized 60'x105' or slightly larger, and a total residential land use area of approximately 8 acres. There is also a proposed 1-acre park in the center of the development.

The total non-potable water demand for Coyote Creek Filing No. 4 is shown **Table 2** below.

**Table 2: Coyote Creek Filing No. 4 Total Non-Potable Demand Summary Table**

| Total Area (Acres) | | Total Irrigated Area (Acres) | Average Day Demand (gpd) | Maximum Day Demand (gpd) | Peak Hour Demand (gpd) |
|---|---|---|---|---|---|
| Single-Family (45% Irrigated) | Park (75% Irrigated) | | | | |
| 8 | 1 | 4.35 | 9,702 | 24,256 | 38,809 |

## Hydraulic Analysis

Bentley's WaterCAD V.8 was used to model and analyze the proposed non-potable water distribution system for two separate scenarios. In one scenario, the non-potable water was supplied solely by the potable water interconnect in Lupton Lane. The potable water interconnect was assigned an HGL of 5116', determined from the potable water model. In the second scenario, the non-potable water was only supplied by the connection to the existing 30" non-potable waterline, and an HGL of 5120' was estimated under the assumption of an 85 psi system pressure. The minimum operating pressure for the system to still meet City criteria was determined to be 50 psi, which corresponds to an HGL of 5040'. The non-potable network was not modeled in a scenario where it was supplied by both non-potable water connections, because at any given time, the non-potable water system will only ever be supplied by one of the two.

The following assumptions were used in developing the WaterCAD model:

- There is an unlimited water supply in each scenario, provided to the site from either the proposed potable water connection in Lupton Lane, or the existing 30" non-potable waterline.
- Existing and proposed non-potable water lines are assumed to be 5' in depth.

Each of the two scenarios was analyzed using maximum hour demand and maximum day demand. Results of the hydraulic analysis and a map of the WaterCAD pipes and nodes for each scenario are included in Appendix C.

## Conclusions

This study presents the results of the analysis performed for the non-potable water system associated with the proposed Coyote Creek Filing No. 4 Development. The design and layout of the non-potable water system as shown and discussed in this study and in the Appendices conform to the Fort Lupton design standards and requirements for minimum pressures and maximum velocities.

# IV. SANITARY SEWER SYSTEM

## Existing and Proposed System

The Coyote Creek Filing No. 4 sanitary sewer will be serviced by the existing Fort Lupton 8" sanitary sewer that runs north along the site's western property boundary to an existing lift station located in the northwest corner of the site.

The proposed 8" Coyote Creek Filing No. 4 sanitary sewer network will tie into the existing 8" sanitary pipe with new manholes two locations—one in the southwest corner of the development, north of 4th Street, and one in the northwest corner of the development, just south of the existing lift station. A map of the existing and proposed sanitary sewer system is included in Appendix D.

## Calculated Wastewater Flows and Design Flow Requirements

The basis of design for this study was set forth in Chapter 4 of the City of Fort Lupton *Standards and Specifications for the Design and Construction of Public Improvements*, 2014. The following is a summary of the criteria used to establish the wastewater flows and preliminary sanitary sewer design:

Criteria for Establishing Wastewater Flows

| | |
|---|---|
| Single-Family Residential Population Density: | 2.90 People/Unit |
| Residential Average Use: | 70 Gallons/Capita/Day |
| Peak Factor: | 3.0 |
| Infiltration and Inflow Rate (for all uses): | 1000 Gallons/Acre/Day |

Design Requirements

| Diameter | Minimum Slope | Maximum Slope | Minimum Flow Velocity (at peak design flow, and n=0.015) |
|---|---|---|---|
| 8 in (minimum) | 0.50% | 19% | 2 ft/s |

The proposed Coyote Creek Filing No. 4 development has a total area of approximately 13.25 acres, comprised of 59 single-family detached residential lots. This corresponds to an estimated total population of 171 and an estimated population density of 13 people per acre. The total wastewater design flows calculated for Coyote Creek Filing No. 4 are shown in **Table 3** below.

**Table 3: Coyote Creek Filing No. 4 Total Wastewater Design Flows Summary Table**

| Acres | DU's | Flow Rate (gpd) | | | |
|---|---|---|---|---|---|
| | | Average Day | Peak Day | Infiltration and Inflow | Peak Day Flow + Infiltration and Inflow |
| 13.25 | 59 | 11,977 | 35,931 | 13,250 | 49,181 |

Wastewater from Coyote Creek Filing No. 4 will be ordinary domestic sewage from single-family residences, and will not contain industrial waste.

## Hydraulic Analysis

Given the proposed grade and proposed sanitary sewer layout, the site was divided into three basins and analyzed at three design points, illustrated in the sanitary sewer system map in Appendix D. The sanitary wastewater loading calculations for each basin can also be found in Appendix D.

Bentley's FlowMaster hydraulic analysis software was used to analyze the proposed sanitary sewer system, and the results are included in Appendix D. Note that the flow velocities range from 1.44 ft/s to 1.80 ft/s, which fall below the minimum flow velocity criteria of 2 ft/s. The low velocities are typical considering the low number of lots contributing to the sewer system. The proposed 8" sanitary sewer pipes are the minimum size allowed, and steeper slopes are not feasible given depth constraints set by the existing sanitary sewer line downstream.

## Conclusions

This study presents the results of the analysis performed for the sanitary sewer system associated with the proposed Coyote Creek Filing No. 4 Development. The design and layout of the sanitary sewer system as shown and discussed in this study and Appendices conform to the Fort Lupton design standards.

# V. CONCLUSION

This study presents the results of the analyses performed for the potable water, non-potable water, and sanitary sewer systems associated with the Coyote Creek Filing No. 4 development. The design of the systems as shown and discussed is in conformance with the Fort Lupton design standards and requirements.

# VI. REFERENCES

1. 2018 International Fire Code; 2018
2. City of Fort Lupton, Standards and Specifications for the Design and Construction of Public Improvements; 2014
3. City of Fort Lupton and Clear Water Solutions, Inc., 2018 Municipal Water Efficiency Plan; 2018

# Appendix A
# Vicinity Map

500 250 0 500

ORIGINAL SCALE: 1" = 500'

APPENDIX A
VICINITY MAP
JOB NO. 16093.00
2021-11-10
SHEET 1 OF 1

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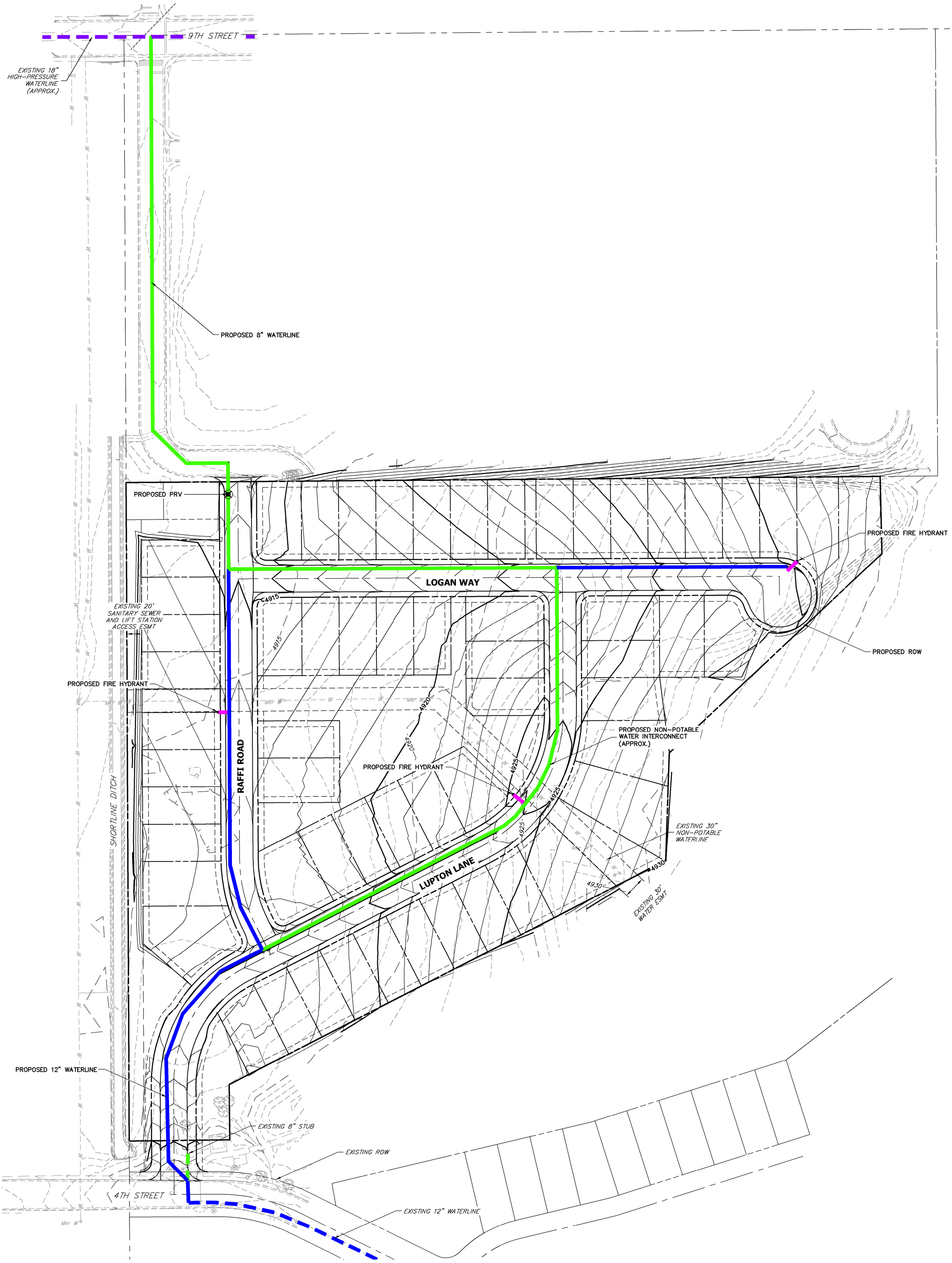
# Appendix B
# Potable Water System Demands, Model Map, and WaterCAD Map & Results

# COYOTE CREEK FILING NO. 4

## POTABLE WATER SYSTEM MAP




## COLOR CODING LEGEND

- 6" ø PROPOSED WATER LINE (FIRE HYDRANT)
- 8" ø PROPOSED WATER MAIN
- 12" ø PROPOSED WATER MAIN
- 8" ø EXISTING WATER MAIN
- 12" ø EXISTING WATER MAIN
- 18" ø EXISTING WATER MAIN

N

60 30 0 60 120

ORIGINAL SCALE: 1" = 60'

POTABLE WATER SYSTEM MAP
COYOTE CREEK FILING NO. 4
JOB NO. 1609300
2021-11-17
SHEET 1 OF 1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| | |
|---|---|
| Project Name | Coyote Creek Filing No. 4 |
| Project Number | 16093.00 |
| Date | 11/8/2021 |
| By | SWW |

| Fort Lupton Criteria | |
|---|---|
| | Potable |
| Avg Day Demand (gpud) | 524 |
| Max Day Factor | 2.5 |
| Max Hour Factor | 4 |
| Fire Flow (gpm) | 1500 |

| Potable Water Demand | | | | | | | |
|---|---|---|---|---|---|---|---|
| Junction | Surface Elevation | TOP Elevation | No. DU Served | Demand (gpm) | | | |
| | | | | Average Day | Max Day | Fire Flow | Peak Hour |
| J-2 | 4917.09 | 4912.09 | 8 | 2.91 | 7.28 | | 11.64 |
| J-3 | 4920.18 | 4915.18 | 4 | 1.46 | 3.64 | | 5.82 |
| J-5 | 4924.81 | 4919.81 | 6 | 2.18 | 5.46 | | 8.73 |
| J-6 | 4929.84 | 4924.84 | 5 | 1.82 | 4.55 | 1500 | 7.28 |
| J-7 | 4924.15 | 4919.15 | 5 | 1.82 | 4.55 | | 7.28 |
| J-8 | 4925.01 | 4920.01 | 4 | 1.46 | 3.64 | 1500 | 5.82 |
| J-9 | 4921.81 | 4916.81 | 6 | 2.18 | 5.46 | | 8.73 |
| J-10 | 4918.37 | 4913.37 | 5 | 1.82 | 4.55 | | 7.28 |
| J-12 | 4915.35 | 4910.35 | 3 | 1.09 | 2.73 | | 4.37 |
| J-13 | 4917.40 | 4912.40 | 4 | 1.46 | 3.64 | | 5.82 |
| J-14 | 4916.18 | 4911.18 | 4 | 1.46 | 3.64 | | 5.82 |
| J-15 | 4914.92 | 4909.92 | 5 | 1.82 | 4.55 | 1500 | 7.28 |
| Total | | | 59 | 21.47 | 53.67 | | 85.88 |

## TABLE B105.1(2) REFERENCE TABLE FOR TABLES B105.1(1) AND B105.2

| FIRE-FLOW CALCULATION AREA (square feet) | | | | | FIRE-FLOW (gallons per minute)[b] | FLOW DURATION (hours) |
|---|---|---|---|---|---|---|
| Type IA and IB[a] | Type IIA and IIIA[a] | Type IV and V-A[a] | Type IIB and IIIB[a] | Type V-B[a] | | |
| 0-22,700 | 0-12,700 | 0-8,200 | 0-5,900 | 0-3,600 | 1,500 | 2 |
| 22,701-30,200 | 12,701-17,000 | 8,201-10,900 | 5,901-7,900 | 3,601-4,800 | 1,750 | |
| 30,201-38,700 | 17,001-21,800 | 10,901-12,900 | 7,901-9,800 | 4,801-6,200 | 2,000 | |
| 38,701-48,300 | 21,801-24,200 | 12,901-17,400 | 9,801-12,600 | 6,201-7,700 | 2,250 | |
| 48,301-59,000 | 24,201-33,200 | 17,401-21,300 | 12,601-15,400 | 7,701-9,400 | 2,500 | |
| 59,001-70,900 | 33,201-39,700 | 21,301-25,500 | 15,401-18,400 | 9,401-11,300 | 2,750 | |
| 70,901-83,700 | 39,701-47,100 | 25,501-30,100 | 18,401-21,800 | 11,301-13,400 | 3,000 | 3 |
| 83,701-97,700 | 47,101-54,900 | 30,101-35,200 | 21,801-25,900 | 13,401-15,600 | 3,250 | |
| 97,701-112,700 | 54,901-63,400 | 35,201-40,600 | 25,901-29,300 | 15,601-18,000 | 3,500 | |
| 112,701-128,700 | 63,401-72,400 | 40,601-46,400 | 29,301-33,500 | 18,001-20,600 | 3,750 | |
| 128,701-145,900 | 72,401-82,100 | 46,401-52,500 | 33,501-37,900 | 20,601-23,300 | 4,000 | 4 |
| 145,901-164,200 | 82,101-92,400 | 52,501-59,100 | 37,901-42,700 | 23,301-26,300 | 4,250 | |
| 164,201-183,400 | 92,401-103,100 | 59,101-66,000 | 42,701-47,700 | 26,301-29,300 | 4,500 | |
| 183,401-203,700 | 103,101-114,600 | 66,001-73,300 | 47,701-53,000 | 29,301-32,600 | 4,750 | |
| 203,701-225,200 | 114,601-126,700 | 73,301-81,100 | 53,001-58,600 | 32,601-36,000 | 5,000 | |
| 225,201-247,700 | 126,701-139,400 | 81,101-89,200 | 58,601-65,400 | 36,001-39,600 | 5,250 | |
| 247,701-271,200 | 139,401-152,600 | 89,201-97,700 | 65,401-70,600 | 39,601-43,400 | 5,500 | |
| 271,201-295,900 | 152,601-166,500 | 97,701-106,500 | 70,601-77,000 | 43,401-47,400 | 5,750 | |
| 295,901-Greater | 166,501-Greater | 106,501-115,800 | 77,001-83,700 | 47,401-51,500 | 6,000 | |
| — | — | 115,801-125,500 | 83,701-90,600 | 51,501-55,700 | 6,250 | |
| — | — | 125,501-135,500 | 90,601-97,900 | 55,701-60,200 | 6,500 | |
| — | — | 135,501-145,800 | 97,901-106,800 | 60,201-64,800 | 6,750 | |
| — | — | 145,801-156,700 | 106,801-113,200 | 64,801-69,600 | 7,000 | |
| — | — | 156,701-167,900 | 113,201-121,300 | 69,601-74,600 | 7,250 | |
| — | — | 167,901-179,400 | 121,301-129,600 | 74,601-79,800 | 7,500 | |
| — | — | 179,401-191,400 | 129,601-138,300 | 79,801-85,100 | 7,750 | |
| — | — | 191,401-Greater | 138,301-Greater | 85,101-Greater | 8,000 | |

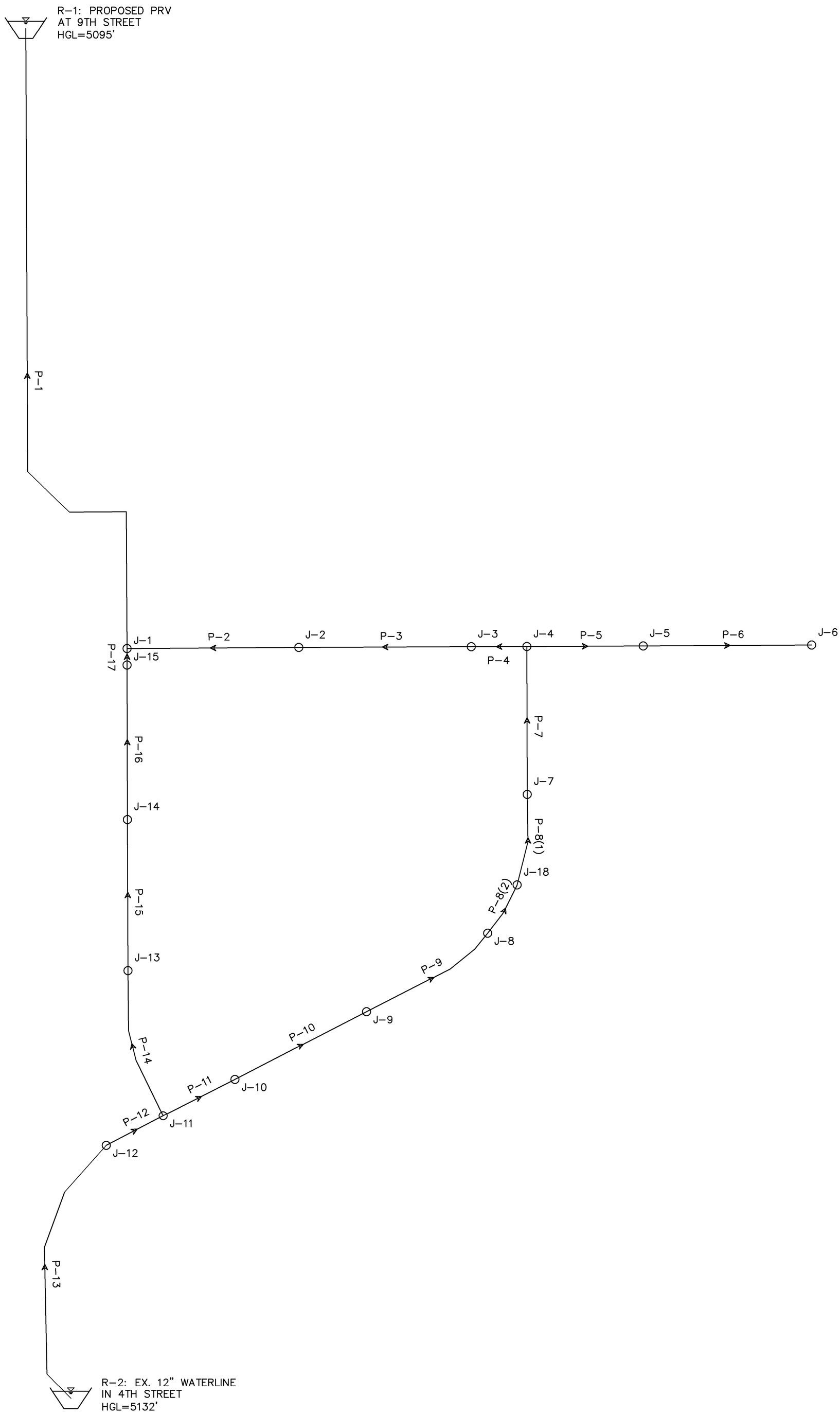
For SI: 1 square foot = 0.0929 $m^2$, 1 gallon per minute = 3.785 L/m, 1 pound per square inch = 6.895 kPa.

a. Types of construction are based on the *International Building Code*.

b. Measured at 20 psi residual pressure.

# COYOTE CREEK FILING NO. 4

## POTABLE WATERCAD MAP




POTABLE WATERCAD MAP
COYOTE CREEK FILING NO. 4
JOB NO. 1609300
2021-11-17
SHEET 1 OF 1

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| Potable - Maximum Hour + Irrigation (Pipe) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Label | Length (ft) | Diameter (in) | Material | Hazen-Williams C | Flow (Absolute) (gpm) | Velocity (Maximum) (ft/s) | Headloss Gradient (ft/ft) |
| P-1 | 756 | 8 | PVC | 130 | 1,580.91 | 10.09 | 0.043 |
| P-13 | 307 | 12 | PVC | 130 | 1,693.74 | 4.8 | 0.007 |
| P-12 | 70 | 12 | PVC | 130 | 1,689.37 | 4.79 | 0.007 |
| P-14 | 166 | 12 | PVC | 130 | 1,347.77 | 3.82 | 0.004 |
| P-15 | 164 | 12 | PVC | 130 | 1,341.95 | 3.81 | 0.004 |
| P-16 | 168 | 12 | PVC | 130 | 1,336.13 | 3.79 | 0.004 |
| P-17 | 18 | 12 | PVC | 150 | 1,328.85 | 3.77 | 0.003 |
| P-11 | 87 | 8 | PVC | 130 | 341.6 | 2.18 | 0.003 |
| P-10 | 161 | 8 | PVC | 130 | 334.32 | 2.13 | 0.002 |
| P-9 | 159 | 8 | PVC | 130 | 325.59 | 2.08 | 0.002 |
| P-8(2) | 62 | 8 | PVC | 130 | 319.77 | 2.04 | 0.002 |
| P-8(1) | 100 | 8 | PVC | 130 | 292.82 | 1.87 | 0.002 |
| P-7 | 161 | 8 | PVC | 130 | 285.54 | 1.82 | 0.002 |
| P-4 | 60 | 8 | PVC | 130 | 269.53 | 1.72 | 0.002 |
| P-3 | 187 | 8 | PVC | 130 | 263.7 | 1.68 | 0.002 |
| P-2 | 187 | 8 | PVC | 130 | 252.06 | 1.61 | 0.001 |
| P-5 | 126 | 12 | PVC | 130 | 16.01 | 0.05 | 0 |
| P-6 | 183 | 12 | PVC | 130 | 7.28 | 0.02 | 0 |

| Potable - Maximum Hour + Irrigation (Junction) | | | | |
|---|---|---|---|---|
| Label | Elevation (ft) | Demand (gpm) | Hydraulic Grade (ft) | Pressure (psi) |
| J-12 | 4,910.35 | 4.37 | 5,129.46 | 95 |
| J-11 | 4,911.49 | 0 | 5,128.99 | 94 |
| J-1 | 4,909.79 | 0 | 5,126.76 | 94 |
| J-15 | 4,909.92 | 7.28 | 5,126.82 | 94 |
| J-14 | 4,911.18 | 5.82 | 5,127.55 | 94 |
| J-13 | 4,912.40 | 5.82 | 5,128.26 | 93 |
| J-10 | 4,913.37 | 7.28 | 5,128.77 | 93 |
| J-2 | 4,912.09 | 11.64 | 5,127.03 | 93 |
| J-3 | 4,915.18 | 5.82 | 5,127.32 | 92 |
| J-9 | 4,916.81 | 8.73 | 5,128.39 | 92 |
| J-4 | 4,916.20 | 0 | 5,127.41 | 91 |
| J-7 | 4,919.15 | 7.28 | 5,127.70 | 90 |
| J-18 | 4,919.68 | 26.95 | 5,127.89 | 90 |
| J-8 | 4,920.01 | 5.82 | 5,128.02 | 90 |
| J-5 | 4,919.81 | 8.73 | 5,127.41 | 90 |
| J-6 | 4,924.84 | 7.28 | 5,127.41 | 88 |

| Potable - Maximum Day + Fire Flow (J-14) and Irrigation (Pipe) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Label | Length (ft) | Diameter (in) | Material | Hazen-Williams C | Flow (Absolute) (gpm) | Velocity (Maximum) (ft/s) | Headloss Gradient (ft/ft) |
| P-1 | 756 | 8 | PVC | 130 | 1,379.84 | 8.81 | 0.033 |
| P-13 | 307 | 12 | PVC | 130 | 2,950.35 | 8.37 | 0.019 |
| P-12 | 70 | 12 | PVC | 130 | 2,947.62 | 8.36 | 0.019 |
| P-14 | 166 | 12 | PVC | 130 | 2,467.34 | 7 | 0.014 |
| P-15 | 164 | 12 | PVC | 130 | 2,463.70 | 6.99 | 0.013 |
| P-11 | 87 | 8 | PVC | 130 | 480.28 | 3.07 | 0.005 |
| P-10 | 161 | 8 | PVC | 130 | 475.73 | 3.04 | 0.005 |
| P-9 | 159 | 8 | PVC | 130 | 470.27 | 3 | 0.005 |
| P-8(2) | 62 | 8 | PVC | 130 | 466.64 | 2.98 | 0.004 |
| P-8(1) | 100 | 8 | PVC | 130 | 449.8 | 2.87 | 0.004 |
| P-7 | 161 | 8 | PVC | 130 | 445.25 | 2.84 | 0.004 |
| P-4 | 60 | 8 | PVC | 130 | 435.24 | 2.78 | 0.004 |
| P-3 | 187 | 8 | PVC | 130 | 431.6 | 2.75 | 0.004 |
| P-16 | 168 | 12 | PVC | 130 | 960.06 | 2.72 | 0.002 |
| P-17 | 18 | 12 | PVC | 150 | 955.52 | 2.71 | 0.002 |
| P-2 | 187 | 8 | PVC | 130 | 424.32 | 2.71 | 0.004 |
| P-5 | 126 | 12 | PVC | 130 | 10.01 | 0.03 | 0 |
| P-6 | 183 | 12 | PVC | 130 | 4.55 | 0.01 | 0 |

| Potable - Maximum Day + Fire Flow (J-14) and Irrigation (Junction) | | | | |
|---|---|---|---|---|
| Label | Elevation (ft) | Demand (gpm) | Hydraulic Grade (ft) | Pressure (psi) |
| J-12 | 4,910.35 | 2.73 | 5,125.76 | 93 |
| J-11 | 4,911.49 | 0 | 5,124.45 | 92 |
| J-10 | 4,913.37 | 4.55 | 5,124.04 | 91 |
| J-13 | 4,912.40 | 3.64 | 5,122.21 | 91 |
| J-1 | 4,909.79 | 0 | 5,119.58 | 91 |
| J-15 | 4,909.92 | 4.55 | 5,119.61 | 91 |
| J-14 | 4,911.18 | 1,503.64 | 5,120.01 | 90 |
| J-2 | 4,912.09 | 7.28 | 5,120.28 | 90 |
| J-9 | 4,916.81 | 5.46 | 5,123.30 | 89 |
| J-3 | 4,915.18 | 3.64 | 5,121.00 | 89 |
| J-4 | 4,916.20 | 0 | 5,121.24 | 89 |
| J-7 | 4,919.15 | 4.55 | 5,121.89 | 88 |
| J-18 | 4,919.68 | 16.84 | 5,122.31 | 88 |
| J-8 | 4,920.01 | 3.64 | 5,122.58 | 88 |
| J-5 | 4,919.81 | 5.46 | 5,121.24 | 87 |
| J-6 | 4,924.84 | 4.55 | 5,121.24 | 85 |

| Potable - Maximum Day + Fire Flow (J-6) and Irrigation (Pipe) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Label | Length (ft) | Diameter (in) | Material | Hazen-Williams C | Flow (Absolute) (gpm) | Velocity (Maximum) (ft/s) | Headloss Gradient (ft/ft) |
| P-1 | 756 | 8 | PVC | 130 | 1,373.69 | 8.77 | 0.033 |
| P-13 | 307 | 12 | PVC | 130 | 2,944.21 | 8.35 | 0.019 |
| P-12 | 70 | 12 | PVC | 130 | 2,941.48 | 8.34 | 0.019 |
| P-14 | 166 | 12 | PVC | 130 | 2,100.68 | 5.96 | 0.01 |
| P-15 | 164 | 12 | PVC | 130 | 2,097.04 | 5.95 | 0.01 |
| P-16 | 168 | 12 | PVC | 130 | 2,093.40 | 5.94 | 0.01 |
| P-17 | 18 | 12 | PVC | 150 | 2,088.85 | 5.93 | 0.008 |
| P-11 | 87 | 8 | PVC | 130 | 840.8 | 5.37 | 0.013 |
| P-10 | 161 | 8 | PVC | 130 | 836.25 | 5.34 | 0.013 |
| P-9 | 159 | 8 | PVC | 130 | 830.79 | 5.3 | 0.013 |
| P-8(2) | 62 | 8 | PVC | 130 | 827.16 | 5.28 | 0.013 |
| P-8(1) | 100 | 8 | PVC | 130 | 810.32 | 5.17 | 0.012 |
| P-7 | 161 | 8 | PVC | 130 | 805.77 | 5.14 | 0.012 |
| P-2 | 187 | 8 | PVC | 130 | 715.16 | 4.56 | 0.01 |
| P-3 | 187 | 8 | PVC | 130 | 707.88 | 4.52 | 0.01 |
| P-4 | 60 | 8 | PVC | 130 | 704.24 | 4.5 | 0.01 |
| P-5 | 126 | 12 | PVC | 130 | 1,510.01 | 4.28 | 0.005 |
| P-6 | 183 | 12 | PVC | 130 | 1,504.55 | 4.27 | 0.005 |

| Potable - Maximum Day + Fire Flow (J-6) and Irrigation (Junction) | | | | |
|---|---|---|---|---|
| Label | Elevation (ft) | Demand (gpm) | Hydraulic Grade (ft) | Pressure (psi) |
| J-12 | 4,910.35 | 2.73 | 5,125.78 | 93 |
| J-11 | 4,911.49 | 0 | 5,124.48 | 92 |
| J-13 | 4,912.40 | 3.64 | 5,122.82 | 91 |
| J-14 | 4,911.18 | 3.64 | 5,121.18 | 91 |
| J-10 | 4,913.37 | 4.55 | 5,123.32 | 91 |
| J-15 | 4,909.92 | 4.55 | 5,119.51 | 91 |
| J-1 | 4,909.79 | 0 | 5,119.37 | 91 |
| J-2 | 4,912.09 | 7.28 | 5,117.54 | 89 |
| J-9 | 4,916.81 | 5.46 | 5,121.21 | 88 |
| J-3 | 4,915.18 | 3.64 | 5,115.74 | 87 |
| J-8 | 4,920.01 | 3.64 | 5,119.15 | 86 |
| J-4 | 4,916.20 | 0 | 5,115.16 | 86 |
| J-18 | 4,919.68 | 16.84 | 5,118.36 | 86 |
| J-7 | 4,919.15 | 4.55 | 5,117.13 | 86 |
| J-5 | 4,919.81 | 5.46 | 5,114.47 | 84 |
| J-6 | 4,924.84 | 1,504.55 | 5,113.48 | 82 |

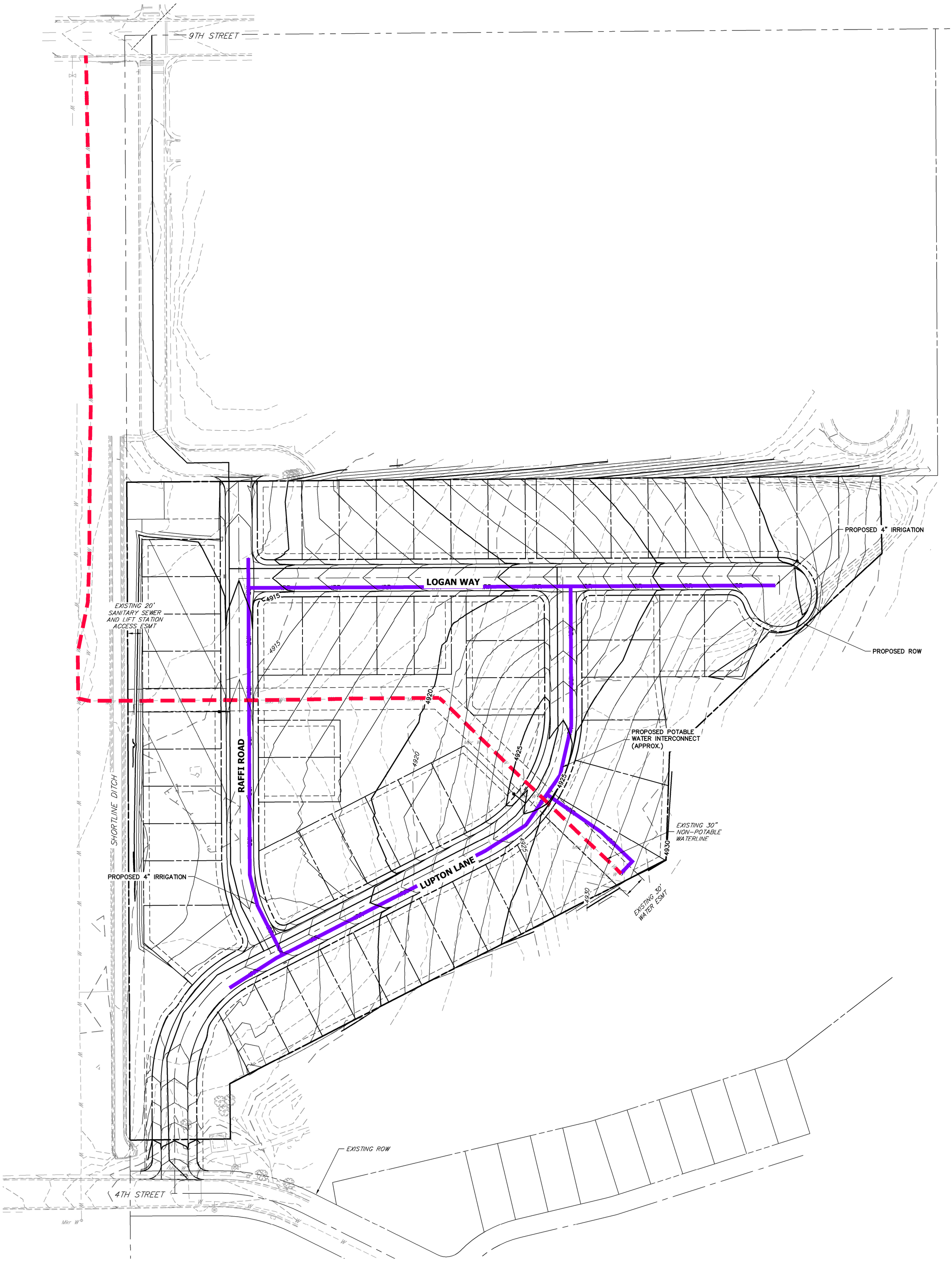
| Potable - Maximum Day + Fire Flow (J-8) and Irrigation (Pipe) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Label | Length (ft) | Diameter (in) | Material | Hazen-Williams C | Flow (Absolute) (gpm) | Velocity (Maximum) (ft/s) | Headloss Gradient (ft/ft) |
| P-1 | 756 | 8 | PVC | 130 | 1,394.89 | 8.9 | 0.034 |
| P-13 | 307 | 12 | PVC | 130 | 2,965.40 | 8.41 | 0.019 |
| P-12 | 70 | 12 | PVC | 130 | 2,962.68 | 8.4 | 0.019 |
| P-11 | 87 | 8 | PVC | 130 | 1,048.59 | 6.69 | 0.02 |
| P-10 | 161 | 8 | PVC | 130 | 1,044.04 | 6.66 | 0.02 |
| P-9 | 159 | 8 | PVC | 130 | 1,038.58 | 6.63 | 0.02 |
| P-14 | 166 | 12 | PVC | 130 | 1,914.09 | 5.43 | 0.008 |
| P-15 | 164 | 12 | PVC | 130 | 1,910.45 | 5.42 | 0.008 |
| P-16 | 168 | 12 | PVC | 130 | 1,906.81 | 5.41 | 0.008 |
| P-17 | 18 | 12 | PVC | 150 | 1,902.26 | 5.4 | 0.006 |
| P-2 | 187 | 8 | PVC | 130 | 507.37 | 3.24 | 0.005 |
| P-3 | 187 | 8 | PVC | 130 | 500.09 | 3.19 | 0.005 |
| P-4 | 60 | 8 | PVC | 130 | 496.45 | 3.17 | 0.005 |
| P-7 | 161 | 8 | PVC | 130 | 486.44 | 3.1 | 0.005 |
| P-8(1) | 100 | 8 | PVC | 130 | 481.90 | 3.08 | 0.005 |
| P-8(2) | 62 | 8 | PVC | 130 | 465.06 | 2.97 | 0.004 |
| P-5 | 126 | 12 | PVC | 130 | 10.01 | 0.03 | 0 |
| P-6 | 183 | 12 | PVC | 130 | 4.55 | 0.01 | 0 |

| Potable - Maximum Day + Fire Flow (J-8) and Irrigation (Junction) | | | | |
|---|---|---|---|---|
| Label | Elevation (ft) | Demand (gpm) | Hydraulic Grade (ft) | Pressure (psi) |
| J-12 | 4,910.35 | 2.73 | 5,125.70 | 93 |
| J-11 | 4,911.49 | 0 | 5,124.38 | 92 |
| J-13 | 4,912.40 | 3.64 | 5,122.99 | 91 |
| J-14 | 4,911.18 | 3.64 | 5,121.61 | 91 |
| J-1 | 4,909.79 | 0 | 5,120.09 | 91 |
| J-15 | 4,909.92 | 4.55 | 5,120.20 | 91 |
| J-10 | 4,913.37 | 4.55 | 5,122.64 | 91 |
| J-2 | 4,912.09 | 7.28 | 5,119.12 | 90 |
| J-3 | 4,915.18 | 3.64 | 5,118.17 | 88 |
| J-9 | 4,916.81 | 5.46 | 5,119.46 | 88 |
| J-4 | 4,916.20 | 0 | 5,117.87 | 87 |
| J-5 | 4,919.81 | 5.46 | 5,117.87 | 86 |
| J-7 | 4,919.15 | 4.55 | 5,117.10 | 86 |
| J-18 | 4,919.68 | 16.84 | 5,116.62 | 85 |
| J-8 | 4,920.01 | 1,503.64 | 5,116.35 | 85 |
| J-6 | 4,924.84 | 4.55 | 5,117.87 | 84 |

# Appendix C
# Non-Potable Water System Demands, Model Map, and WaterCAD Map & Results

# COYOTE CREEK FILING NO. 4

## NON-POTABLE WATER SYSTEM MAP




## COLOR CODING LEGEND

4" ø PROPOSED IRRIGATION MAIN

30" ø PROPOSED IRRIGATION MAIN

60 30 0 60 120

ORIGINAL SCALE: 1" = 60'

NON-POTABLE WATER
SYSTEM MAP
COYOTE CREEK FILING NO. 4
JOB NO. 1609300
2021-11-17
SHEET 1 OF 1


J·R ENGINEERING
A Westrian Company

Centennial 303-740-9393 • Colorado Springs 719-593-2593
Fort Collins 970-491-9888 • www.jrengineering.com

| | |
|---|---|
| Project Name | Coyote Creek Filing No. 4 |
| Project Number | 16093.00 |
| Date | 11/8/2021 |
| By | SWW |

| Fort Lupton Criteria | |
|---|---|
| | Non-Potable |
| Avg Day Demand (gpm/acre)* | 1.55 |
| Max Day Factor | 2.5 |
| Max Hour Factor | 4 |

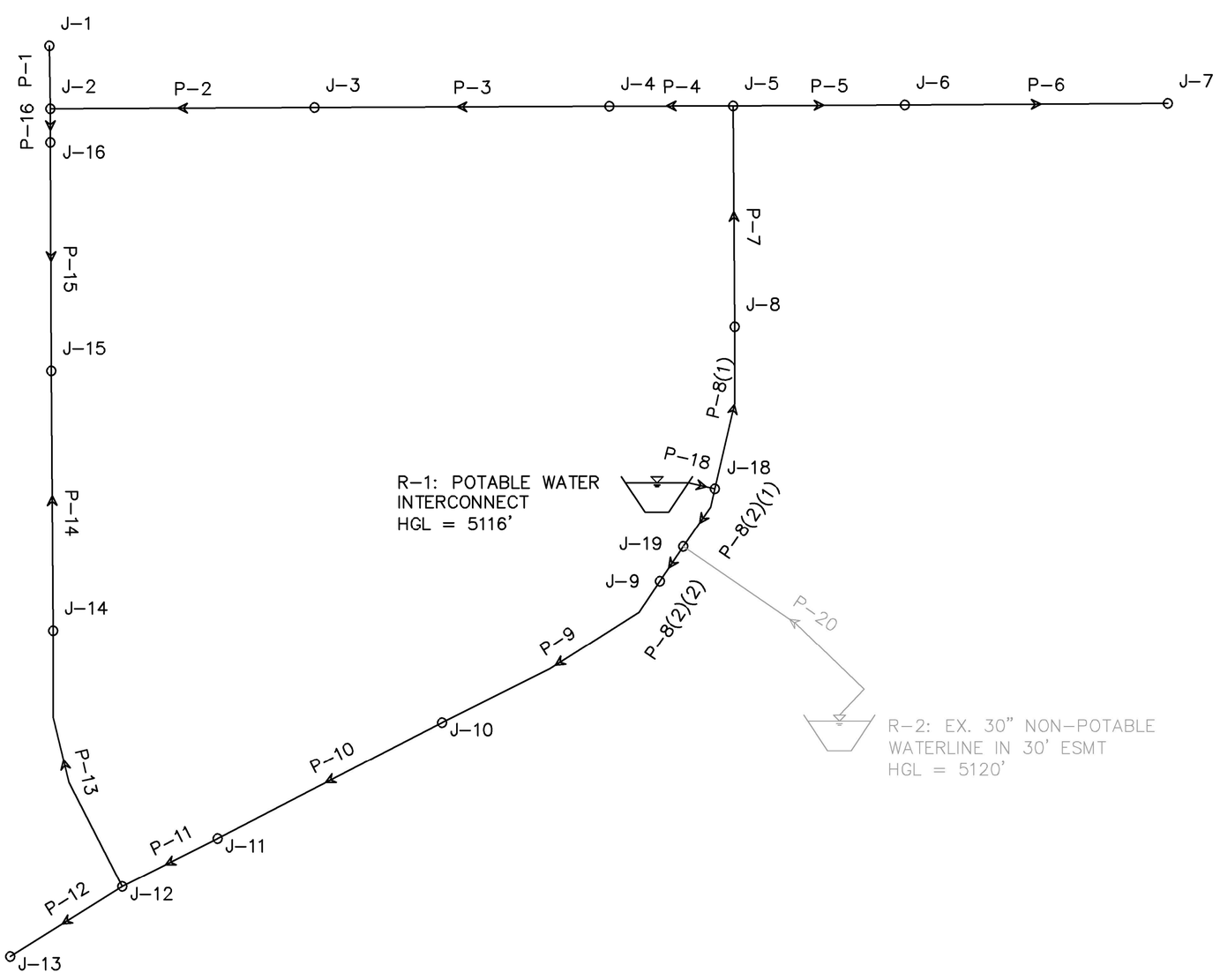
*From the SACWSD Design & Construction Standards

| Non-Potable Water Demand | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Junction | Surface Elevation | TOP Elevation | No. DU Served | No. 50'x105' Lots | No. 60'x105' Lots** | Park Area (acres) | Total Irrigated Area (acre) | Demand (gpm) | | |
| | | | 45% Irrigated | | | 75% Irrigated | | Average Day | Max Day | Peak Hour |
| J-3 | 4916.97 | 4911.97 | 8 | 8 | 0 | | 0.434 | 0.67 | 1.68 | 2.69 |
| J-4 | 4920.06 | 4915.06 | 4 | 3 | 1 | | 0.228 | 0.35 | 0.88 | 1.41 |
| J-6 | 4924.70 | 4919.70 | 6 | 4 | 2 | | 0.347 | 0.54 | 1.35 | 2.15 |
| J-7 | 4929.42 | 4924.42 | 5 | 2 | 3.6 | | 0.343 | 0.53 | 1.33 | 2.13 |
| J-8 | 4924.09 | 4919.09 | 5 | 3 | 2.4 | | 0.319 | 0.49 | 1.24 | 1.98 |
| J-9 | 4924.99 | 4919.99 | 4 | 1 | 4.2 | | 0.328 | 0.51 | 1.27 | 2.03 |
| J-10 | 4921.79 | 4916.79 | 6 | 6 | 0 | | 0.325 | 0.50 | 1.26 | 2.02 |
| J-11 | 4918.35 | 4913.35 | 5 | 4 | 1.3 | | 0.302 | 0.47 | 1.17 | 1.87 |
| J-13 | 4915.35 | 4910.35 | 3 | 1 | 2.6 | | 0.223 | 0.35 | 0.87 | 1.39 |
| J-14 | 4917.28 | 4912.28 | 4 | 2 | 2 | | 0.239 | 0.37 | 0.92 | 1.48 |
| J-15 | 4916.07 | 4911.07 | 4 | 4 | 0 | 1 | 0.967 | 1.50 | 3.75 | 6.00 |
| J-16 | 4914.98 | 4909.98 | 5 | 3 | 2 | | 0.293 | 0.45 | 1.13 | 1.82 |
| Total | | | 59 | 41 | 21 | 1 | 4.35 | 6.74 | 16.84 | 26.95 |

**Includes lots that are larger than 60'x105', expressed as a multiple of 60'x105' lots based on lot area

# COYOTE CREEK FILING NO. 4

**NON-POTABLE WATERCAD MAP**
**WITH POTABLE WATER INTERCONNECT**




NON–POTABLE WATERCAD MAP
COYOTE CREEK FILING NO. 4
JOB NO. 1609300
2021–11–17
SHEET 1 OF 2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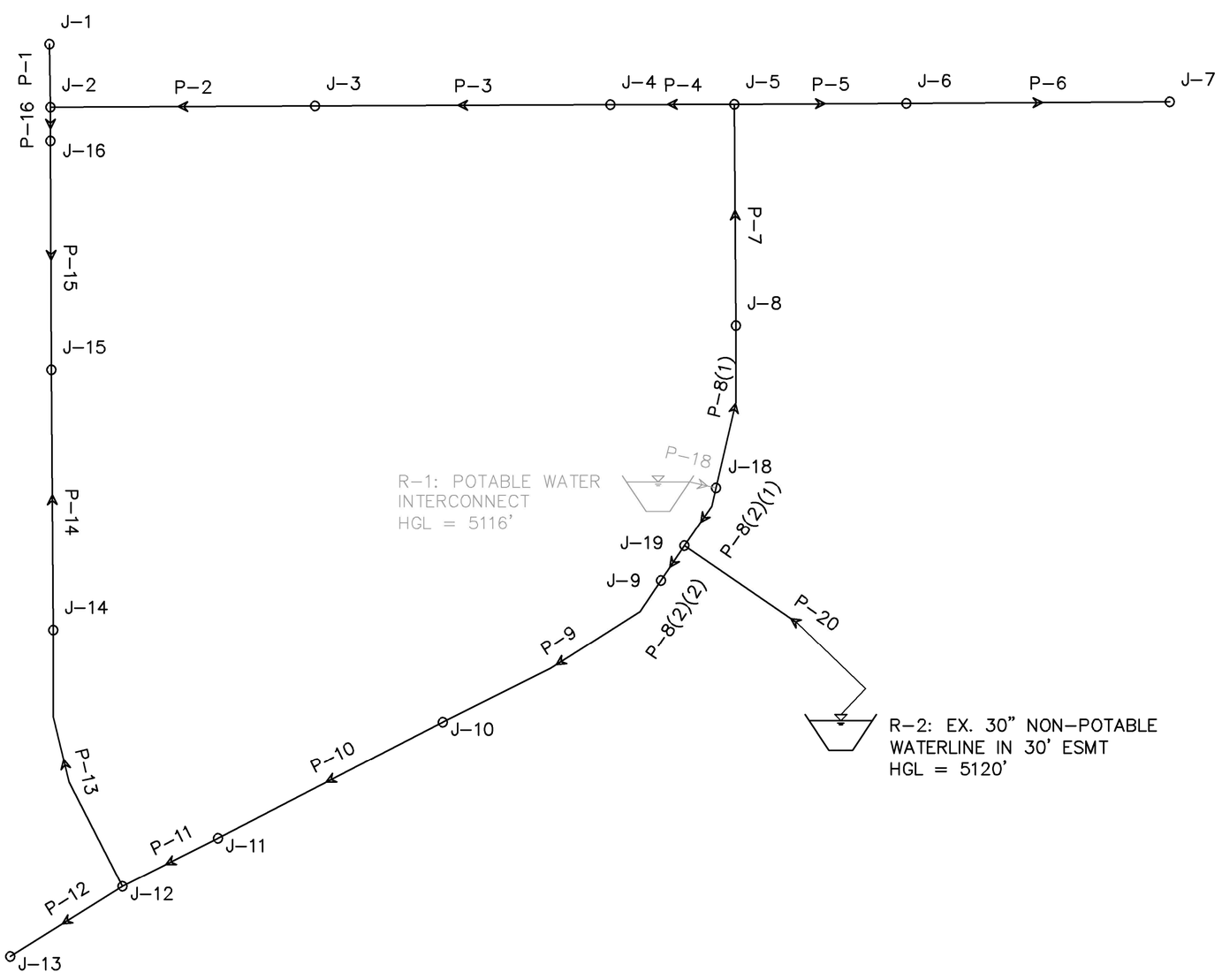
# COYOTE CREEK FILING NO. 4

## NON-POTABLE WATERCAD MAP

## WITH CONNECTION TO EXISTING 30" NON-POTABLE WATERLINE IN 30' ESMT




NON–POTABLE WATERCAD MAP
COYOTE CREEK FILING NO. 4
JOB NO. 1609300
2021–11–17
SHEET 2 OF 2

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| Irrigation w/ Potable Interconnect - Maximum Hour (Pipe) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Label | Length (ft) | Diameter (in) | Material | Hazen-Williams C | Flow (Absolute) (gpm) | Velocity (Maximum) (ft/s) | Headloss Gradient (ft/ft) |
| P-18 | 17 | 4 | PVC | 130 | 26.97 | 0.69 | 0.001 |
| P-8(1) | 104 | 4 | PVC | 130 | 14.05 | 0.36 | 0 |
| P-8(2)(1) | 42 | 4 | PVC | 130 | 12.92 | 0.33 | 0 |
| P-8(2)(2) | 27 | 4 | PVC | 130 | 12.92 | 0.33 | 0 |
| P-7 | 140 | 4 | PVC | 130 | 12.07 | 0.31 | 0 |
| P-9 | 167 | 4 | PVC | 130 | 10.89 | 0.28 | 0 |
| P-10 | 160 | 4 | PVC | 130 | 8.87 | 0.23 | 0 |
| P-4 | 78 | 4 | PVC | 130 | 7.79 | 0.2 | 0 |
| P-11 | 68 | 4 | PVC | 130 | 7 | 0.18 | 0 |
| P-3 | 187 | 4 | PVC | 130 | 6.38 | 0.16 | 0 |
| P-13 | 172 | 4 | PVC | 130 | 5.61 | 0.14 | 0 |
| P-5 | 109 | 4 | PVC | 130 | 4.28 | 0.11 | 0 |
| P-14 | 165 | 4 | PVC | 130 | 4.13 | 0.11 | 0 |
| P-2 | 167 | 4 | PVC | 130 | 3.69 | 0.09 | 0 |
| P-16 | 21 | 4 | PVC | 130 | 3.69 | 0.09 | 0 |
| P-6 | 167 | 4 | PVC | 130 | 2.13 | 0.05 | 0 |
| P-15 | 145 | 4 | PVC | 130 | 1.87 | 0.05 | 0 |
| P-12 | 84 | 4 | PVC | 130 | 1.39 | 0.04 | 0 |
| P-1 | 40 | 4 | PVC | 130 | 0 | 0 | 0 |
| P-20 | 169 | 4 | PVC | 130 | (N/A) | (N/A) | (N/A) |

| Irrigation w/ Potable Interconnect - Maximum Hour (Junction) | | | | |
|---|---|---|---|---|
| Label | Elevation (ft) | Demand (gpm) | Hydraulic Grade (ft) | Pressure (psi) |
| J-1 | 4,909.51 | 0 | 5,115.93 | 89 |
| J-2 | 4,909.82 | 0 | 5,115.93 | 89 |
| J-16 | 4,909.98 | 1.82 | 5,115.93 | 89 |
| J-13 | 4,910.35 | 1.39 | 5,115.94 | 89 |
| J-15 | 4,911.07 | 6 | 5,115.93 | 89 |
| J-12 | 4,911.90 | 0 | 5,115.94 | 88 |
| J-3 | 4,911.97 | 2.69 | 5,115.93 | 88 |
| J-14 | 4,912.28 | 1.48 | 5,115.93 | 88 |
| J-11 | 4,913.35 | 1.87 | 5,115.94 | 88 |
| J-4 | 4,915.06 | 1.41 | 5,115.94 | 87 |
| J-5 | 4,916.47 | 0 | 5,115.95 | 86 |
| J-10 | 4,916.79 | 2.02 | 5,115.96 | 86 |
| J-8 | 4,919.09 | 1.98 | 5,115.97 | 85 |
| J-6 | 4,919.70 | 2.15 | 5,115.94 | 85 |
| J-9 | 4,919.99 | 2.03 | 5,115.98 | 85 |
| J-18 | 4,920.36 | 0 | 5,115.99 | 85 |
| J-19 | 4,921.74 | 0 | 5,115.98 | 84 |
| J-7 | 4,924.42 | 2.13 | 5,115.94 | 83 |

| Irrigation w/ Potable Interconnect - Maximum Day (Pipe) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Label | Length (ft) | Diameter (in) | Material | Hazen-Williams C | Flow (Absolute) (gpm) | Velocity (Maximum) (ft/s) | Headloss Gradient (ft/ft) |
| P-18 | 17 | 4 | PVC | 130 | 16.85 | 0.43 | 0 |
| P-8(1) | 104 | 4 | PVC | 130 | 8.78 | 0.22 | 0 |
| P-8(2)(1) | 42 | 4 | PVC | 130 | 8.07 | 0.21 | 0 |
| P-8(2)(2) | 27 | 4 | PVC | 130 | 8.07 | 0.21 | 0 |
| P-7 | 140 | 4 | PVC | 130 | 7.54 | 0.19 | 0 |
| P-9 | 167 | 4 | PVC | 130 | 6.8 | 0.17 | 0 |
| P-10 | 160 | 4 | PVC | 130 | 5.54 | 0.14 | 0 |
| P-4 | 78 | 4 | PVC | 130 | 4.86 | 0.12 | 0 |
| P-11 | 68 | 4 | PVC | 130 | 4.37 | 0.11 | 0 |
| P-3 | 187 | 4 | PVC | 130 | 3.98 | 0.1 | 0 |
| P-13 | 172 | 4 | PVC | 130 | 3.5 | 0.09 | 0 |
| P-5 | 109 | 4 | PVC | 130 | 2.68 | 0.07 | 0 |
| P-14 | 165 | 4 | PVC | 130 | 2.58 | 0.07 | 0 |
| P-2 | 167 | 4 | PVC | 130 | 2.3 | 0.06 | 0 |
| P-16 | 21 | 4 | PVC | 130 | 2.3 | 0.06 | 0 |
| P-6 | 167 | 4 | PVC | 130 | 1.33 | 0.03 | 0 |
| P-15 | 145 | 4 | PVC | 130 | 1.17 | 0.03 | 0 |
| P-12 | 84 | 4 | PVC | 130 | 0.87 | 0.02 | 0 |
| P-1 | 40 | 4 | PVC | 130 | 0 | 0 | 0 |
| P-20 | 169 | 4 | PVC | 130 | (N/A) | (N/A) | (N/A) |

| Irrigation w/ Potable Interconnect - Maximum Day (Junction) | | | | |
|---|---|---|---|---|
| Label | Elevation (ft) | Demand (gpm) | Hydraulic Grade (ft) | Pressure (psi) |
| J-1 | 4,909.51 | 0 | 5,115.97 | 89 |
| J-2 | 4,909.82 | 0 | 5,115.97 | 89 |
| J-16 | 4,909.98 | 1.13 | 5,115.97 | 89 |
| J-13 | 4,910.35 | 0.87 | 5,115.97 | 89 |
| J-15 | 4,911.07 | 3.75 | 5,115.97 | 89 |
| J-12 | 4,911.90 | 0 | 5,115.97 | 88 |
| J-3 | 4,911.97 | 1.68 | 5,115.97 | 88 |
| J-14 | 4,912.28 | 0.92 | 5,115.97 | 88 |
| J-11 | 4,913.35 | 1.17 | 5,115.98 | 88 |
| J-4 | 4,915.06 | 0.88 | 5,115.98 | 87 |
| J-5 | 4,916.47 | 0 | 5,115.98 | 86 |
| J-10 | 4,916.79 | 1.26 | 5,115.98 | 86 |
| J-8 | 4,919.09 | 1.24 | 5,115.99 | 85 |
| J-6 | 4,919.70 | 1.35 | 5,115.98 | 85 |
| J-9 | 4,919.99 | 1.27 | 5,115.99 | 85 |
| J-18 | 4,920.36 | 0 | 5,116.00 | 85 |
| J-19 | 4,921.74 | 0 | 5,115.99 | 84 |
| J-7 | 4,924.42 | 1.33 | 5,115.98 | 83 |

| Irrigation w/ Connection to Ex. 30" - Maximum Hour (Pipe) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Label | Length (ft) | Diameter (in) | Material | Hazen-Williams C | Flow (Absolute) (gpm) | Velocity (Maximum) (ft/s) | Headloss Gradient (ft/ft) |
| P-20 | 169 | 4 | PVC | 130 | 26.97 | 0.69 | 0.001 |
| P-8(2)(2) | 27 | 4 | PVC | 130 | 13.56 | 0.35 | 0 |
| P-8(1) | 104 | 4 | PVC | 130 | 13.41 | 0.34 | 0 |
| P-8(2)(1) | 42 | 4 | PVC | 130 | 13.41 | 0.34 | 0 |
| P-7 | 140 | 4 | PVC | 130 | 11.43 | 0.29 | 0 |
| P-9 | 167 | 4 | PVC | 130 | 11.53 | 0.29 | 0 |
| P-10 | 160 | 4 | PVC | 130 | 9.51 | 0.24 | 0 |
| P-11 | 68 | 4 | PVC | 130 | 7.64 | 0.2 | 0 |
| P-4 | 78 | 4 | PVC | 130 | 7.15 | 0.18 | 0 |
| P-13 | 172 | 4 | PVC | 130 | 6.25 | 0.16 | 0 |
| P-3 | 187 | 4 | PVC | 130 | 5.74 | 0.15 | 0 |
| P-14 | 165 | 4 | PVC | 130 | 4.77 | 0.12 | 0 |
| P-5 | 109 | 4 | PVC | 130 | 4.28 | 0.11 | 0 |
| P-2 | 167 | 4 | PVC | 130 | 3.05 | 0.08 | 0 |
| P-16 | 21 | 4 | PVC | 130 | 3.05 | 0.08 | 0 |
| P-6 | 167 | 4 | PVC | 130 | 2.13 | 0.05 | 0 |
| P-12 | 84 | 4 | PVC | 130 | 1.39 | 0.04 | 0 |
| P-15 | 145 | 4 | PVC | 130 | 1.23 | 0.03 | 0 |
| P-1 | 40 | 4 | PVC | 130 | 0 | 0 | 0 |
| P-18 | 17 | 4 | PVC | 130 | (N/A) | (N/A) | (N/A) |

| Irrigation w/ Connection to Ex. 30" - Maximum Hour (Junction) | | | | |
|---|---|---|---|---|
| Label | Elevation (ft) | Demand (gpm) | Hydraulic Grade (ft) | Pressure (psi) |
| J-1 | 4,909.51 | 0 | 5,119.83 | 91 |
| J-2 | 4,909.82 | 0 | 5,119.83 | 91 |
| J-13 | 4,910.35 | 1.39 | 5,119.84 | 91 |
| J-16 | 4,909.98 | 1.82 | 5,119.83 | 91 |
| J-3 | 4,911.97 | 2.69 | 5,119.83 | 90 |
| J-12 | 4,911.90 | 0 | 5,119.84 | 90 |
| J-14 | 4,912.28 | 1.48 | 5,119.83 | 90 |
| J-15 | 4,911.07 | 6 | 5,119.83 | 90 |
| J-4 | 4,915.06 | 1.41 | 5,119.84 | 89 |
| J-11 | 4,913.35 | 1.87 | 5,119.84 | 89 |
| J-5 | 4,916.47 | 0 | 5,119.84 | 88 |
| J-10 | 4,916.79 | 2.02 | 5,119.86 | 88 |
| J-6 | 4,919.70 | 2.15 | 5,119.84 | 87 |
| J-8 | 4,919.09 | 1.98 | 5,119.86 | 87 |
| J-9 | 4,919.99 | 2.03 | 5,119.88 | 86 |
| J-18 | 4,920.36 | 0 | 5,119.88 | 86 |
| J-19 | 4,921.74 | 0 | 5,119.89 | 86 |
| J-7 | 4,924.42 | 2.13 | 5,119.84 | 85 |

| Irrigation w/ Connection to Ex. 30" - Maximum Day (Pipe) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Label | Length (ft) | Diameter (in) | Material | Hazen-Williams C | Flow (Absolute) (gpm) | Velocity (Maximum) (ft/s) | Headloss Gradient (ft/ft) |
| P-20 | 169 | 4 | PVC | 130 | 16.85 | 0.43 | 0 |
| P-8(2)(2) | 27 | 4 | PVC | 130 | 8.47 | 0.22 | 0 |
| P-8(1) | 104 | 4 | PVC | 130 | 8.38 | 0.21 | 0 |
| P-8(2)(1) | 42 | 4 | PVC | 130 | 8.38 | 0.21 | 0 |
| P-7 | 140 | 4 | PVC | 130 | 7.14 | 0.18 | 0 |
| P-9 | 167 | 4 | PVC | 130 | 7.2 | 0.18 | 0 |
| P-10 | 160 | 4 | PVC | 130 | 5.94 | 0.15 | 0 |
| P-11 | 68 | 4 | PVC | 130 | 4.77 | 0.12 | 0 |
| P-4 | 78 | 4 | PVC | 130 | 4.46 | 0.11 | 0 |
| P-13 | 172 | 4 | PVC | 130 | 3.9 | 0.1 | 0 |
| P-3 | 187 | 4 | PVC | 130 | 3.58 | 0.09 | 0 |
| P-14 | 165 | 4 | PVC | 130 | 2.98 | 0.08 | 0 |
| P-5 | 109 | 4 | PVC | 130 | 2.68 | 0.07 | 0 |
| P-2 | 167 | 4 | PVC | 130 | 1.9 | 0.05 | 0 |
| P-16 | 21 | 4 | PVC | 130 | 1.9 | 0.05 | 0 |
| P-6 | 167 | 4 | PVC | 130 | 1.33 | 0.03 | 0 |
| P-12 | 84 | 4 | PVC | 130 | 0.87 | 0.02 | 0 |
| P-15 | 145 | 4 | PVC | 130 | 0.77 | 0.02 | 0 |
| P-1 | 40 | 4 | PVC | 130 | 0 | 0 | 0 |
| P-18 | 17 | 4 | PVC | 130 | (N/A) | (N/A) | (N/A) |

| Irrigation w/ Connection to Ex. 30" - Maximum Day (Junction) | | | | |
|---|---|---|---|---|
| Label | Elevation (ft) | Demand (gpm) | Hydraulic Grade (ft) | Pressure (psi) |
| J-1 | 4,909.51 | 0 | 5,119.93 | 91 |
| J-2 | 4,909.82 | 0 | 5,119.93 | 91 |
| J-13 | 4,910.35 | 0.87 | 5,119.93 | 91 |
| J-16 | 4,909.98 | 1.13 | 5,119.93 | 91 |
| J-3 | 4,911.97 | 1.68 | 5,119.93 | 90 |
| J-12 | 4,911.90 | 0 | 5,119.93 | 90 |
| J-14 | 4,912.28 | 0.92 | 5,119.93 | 90 |
| J-15 | 4,911.07 | 3.75 | 5,119.93 | 90 |
| J-4 | 4,915.06 | 0.88 | 5,119.93 | 89 |
| J-11 | 4,913.35 | 1.17 | 5,119.94 | 89 |
| J-5 | 4,916.47 | 0 | 5,119.93 | 88 |
| J-10 | 4,916.79 | 1.26 | 5,119.94 | 88 |
| J-6 | 4,919.70 | 1.35 | 5,119.93 | 87 |
| J-8 | 4,919.09 | 1.24 | 5,119.94 | 87 |
| J-9 | 4,919.99 | 1.27 | 5,119.95 | 87 |
| J-18 | 4,920.36 | 0 | 5,119.95 | 86 |
| J-19 | 4,921.74 | 0 | 5,119.95 | 86 |
| J-7 | 4,924.42 | 1.33 | 5,119.93 | 85 |

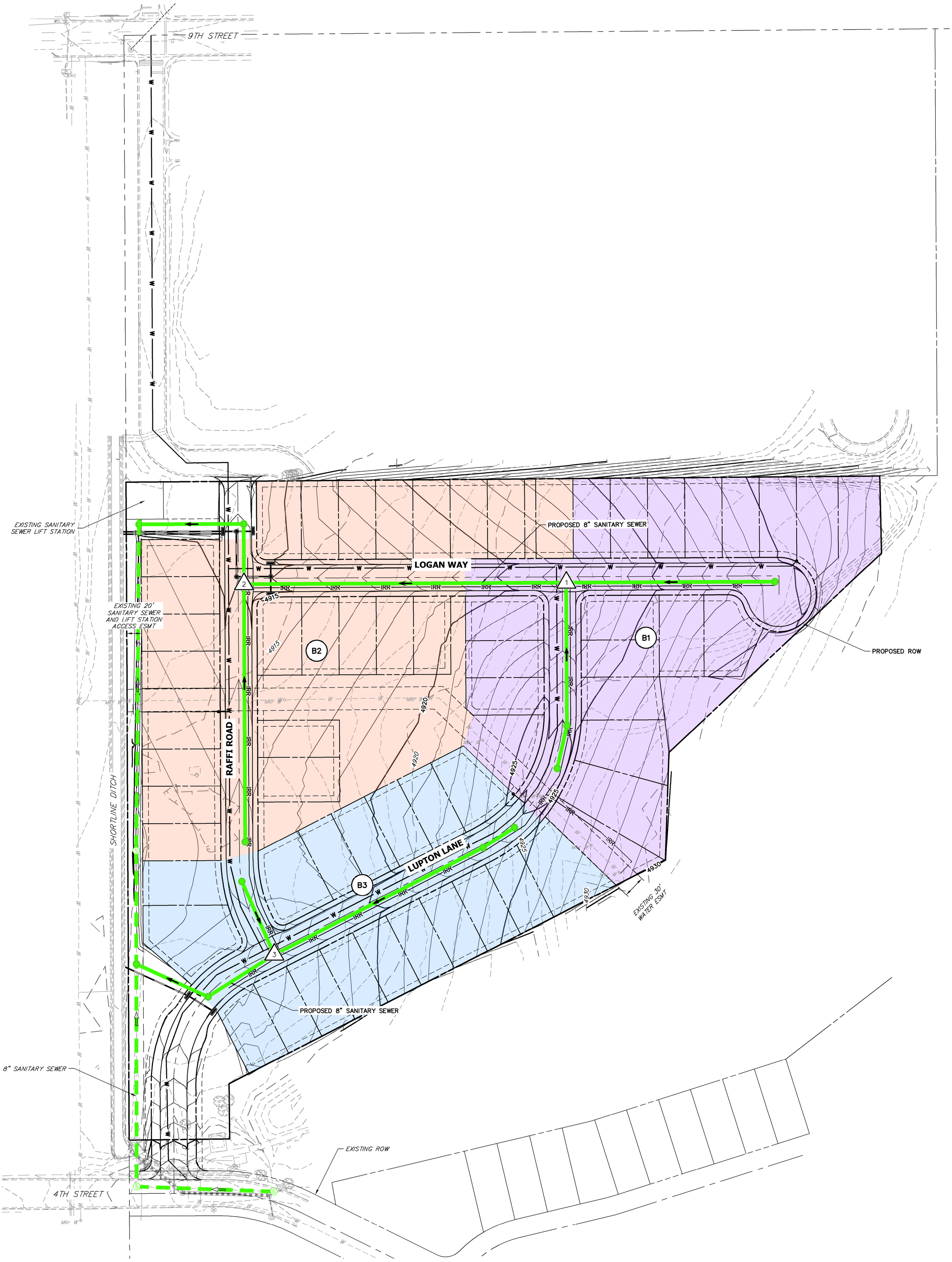
| Irrigation w/ Connection to Ex. 30", Minimum System Pressure - Maximum Hour (Pipe) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Label | Length (ft) | Diameter (in) | Material | Hazen-Williams C | Flow (Absolute) (gpm) | Velocity (Maximum) (ft/s) | Headloss Gradient (ft/ft) |
| P-20 | 169 | 4 | PVC | 130 | 26.97 | 0.69 | 0.001 |
| P-8(2)(2) | 27 | 4 | PVC | 130 | 13.56 | 0.35 | 0 |
| P-8(1) | 104 | 4 | PVC | 130 | 13.41 | 0.34 | 0 |
| P-8(2)(1) | 42 | 4 | PVC | 130 | 13.41 | 0.34 | 0 |
| P-9 | 167 | 4 | PVC | 130 | 11.53 | 0.29 | 0 |
| P-7 | 140 | 4 | PVC | 130 | 11.43 | 0.29 | 0 |
| P-10 | 160 | 4 | PVC | 130 | 9.51 | 0.24 | 0 |
| P-11 | 68 | 4 | PVC | 130 | 7.64 | 0.2 | 0 |
| P-4 | 78 | 4 | PVC | 130 | 7.15 | 0.18 | 0 |
| P-13 | 172 | 4 | PVC | 130 | 6.25 | 0.16 | 0 |
| P-3 | 187 | 4 | PVC | 130 | 5.74 | 0.15 | 0 |
| P-14 | 165 | 4 | PVC | 130 | 4.77 | 0.12 | 0 |
| P-5 | 109 | 4 | PVC | 130 | 4.28 | 0.11 | 0 |
| P-2 | 167 | 4 | PVC | 130 | 3.05 | 0.08 | 0 |
| P-16 | 21 | 4 | PVC | 130 | 3.05 | 0.08 | 0 |
| P-6 | 167 | 4 | PVC | 130 | 2.13 | 0.05 | 0 |
| P-12 | 84 | 4 | PVC | 130 | 1.39 | 0.04 | 0 |
| P-15 | 145 | 4 | PVC | 130 | 1.23 | 0.03 | 0 |
| P-1 | 40 | 4 | PVC | 130 | 0 | 0 | 0 |
| P-18 | 17 | 4 | PVC | 130 | (N/A) | (N/A) | (N/A) |

| Irrigation w/ Connection to Ex. 30", Minimum System Pressure - Maximum Day (Junction) | | | | |
|---|---|---|---|---|
| Label | Elevation (ft) | Demand (gpm) | Hydraulic Grade (ft) | Pressure (psi) |
| J-15 | 4,911.07 | 6 | 5,039.83 | 56 |
| J-13 | 4,910.35 | 1.39 | 5,039.84 | 56 |
| J-16 | 4,909.98 | 1.82 | 5,039.83 | 56 |
| J-2 | 4,909.82 | 0 | 5,039.83 | 56 |
| J-1 | 4,909.51 | 0 | 5,039.83 | 56 |
| J-11 | 4,913.35 | 1.87 | 5,039.84 | 55 |
| J-14 | 4,912.28 | 1.48 | 5,039.83 | 55 |
| J-3 | 4,911.97 | 2.69 | 5,039.83 | 55 |
| J-12 | 4,911.90 | 0 | 5,039.84 | 55 |
| J-4 | 4,915.06 | 1.41 | 5,039.84 | 54 |
| J-10 | 4,916.79 | 2.02 | 5,039.86 | 53 |
| J-5 | 4,916.47 | 0 | 5,039.84 | 53 |
| J-18 | 4,920.36 | 0 | 5,039.88 | 52 |
| J-9 | 4,919.99 | 2.03 | 5,039.88 | 52 |
| J-6 | 4,919.70 | 2.15 | 5,039.84 | 52 |
| J-8 | 4,919.09 | 1.98 | 5,039.86 | 52 |
| J-19 | 4,921.74 | 0 | 5,039.89 | 51 |
| J-7 | 4,924.42 | 2.13 | 5,039.84 | 50 |

# Appendix C
# Sanitary Sewer System Loading, Basin Map, and FlowMaster Results

# COYOTE CREEK FILING NO. 4

## SANITARY SEWER SYSTEM MAP




## COLOR CODING LEGEND

- 8" ø PROPOSED SANITARY SEWER MAIN
- 12" ø PROPOSED SANITARY SEWER MAIN
- 8" ø EXISTING SANITARY SEWER MAIN
- PROPOSED SANITARY DRAINAGE ARROW
- EXISTING SANITARY DRAINAGE ARROW
- 1 — DESIGN POINT
- B1 — SANITARY BASIN DESIGNATION

N

60 30 0 60 120

ORIGINAL SCALE: 1" = 60'

SANITARY SEWER SYSTEM MAP
COYOTE CREEK FILING NO. 4
JOB NO. 1609300
2021-11-17
SHEET 1 OF 1


J·R ENGINEERING
A Westrian Company

Centennial 303-740-9393 • Colorado Springs 719-593-2593
Fort Collins 970-491-9888 • www.jrengineering.com

| | |
|---|---|
| Project Name | Coyote Creek Filing No. 4 |
| Project Number | 16093.00 |
| Date | 11/8/2021 |
| By | SWW |

| Fort Lupton Criteria | |
|---|---|
| Residential Population Density (people/unit) | 2.90 |
| Average Daily Flow (gpd/person) | 70 |
| Peak Factor | 3.0 |
| Infiltration and Inflow Rate (gpad) | 1000 |

**Onsite Sanitary Sewer Loadings**

| Basin | Land Use | Acres | No. DU's | Flow Rate (gpm) | | | |
|---|---|---|---|---|---|---|---|
| | | | | Average Day | Peak Day | Infiltration & Inflow | PDF + I&I |
| B1 | Single-Family Residential | 4.15 | 18 | 2.54 | 7.61 | 2.88 | 10.49 |
| B2 | Single-Family Residential | 4.63 | 23 | 3.24 | 9.73 | 3.21 | 12.94 |
| B3 | Single-Family Residential | 3.22 | 18 | 2.54 | 7.61 | 2.23 | 9.85 |
| Total | PA-4 | 13.25 | 59 | 8.32 | 24.95 | | 33.28 |

# Worksheet for DP-1

| Project Description | |
|---|---|
| Friction Method | Manning Formula |
| Solve For | Normal Depth |

| Input Data | |
|---|---|
| Roughness Coefficient | 0.015 |
| Channel Slope | 0.028 ft/ft |
| Diameter | 8.0 in |
| Discharge | 0.02 cfs |

| Results | |
|---|---|
| Normal Depth | 0.6 in |
| Flow Area | 0.0 ft² |
| Wetted Perimeter | 0.4 ft |
| Hydraulic Radius | 0.4 in |
| Top Width | 0.36 ft |
| Critical Depth | 0.8 in |
| Percent Full | 8.1 % |
| Critical Slope | 0.010 ft/ft |
| Velocity | 1.76 ft/s |
| Velocity Head | 0.05 ft |
| Specific Energy | 0.10 ft |
| Froude Number | 1.619 |
| Maximum Discharge | 1.87 cfs |
| Discharge Full | 1.74 cfs |
| Slope Full | 0.000 ft/ft |
| Flow Type | Supercritical |

| GVF Input Data | |
|---|---|
| Downstream Depth | 0.0 in |
| Length | 0.0 ft |
| Number Of Steps | 0 |

| GVF Output Data | |
|---|---|
| Upstream Depth | 0.0 in |
| Profile Description | N/A |
| Profile Headloss | 0.00 ft |
| Average End Depth Over Rise | 0.0 % |
| Normal Depth Over Rise | 8.1 % |
| Downstream Velocity | Infinity ft/s |
| Upstream Velocity | Infinity ft/s |
| Normal Depth | 0.6 in |
| Critical Depth | 0.8 in |
| Channel Slope | 0.028 ft/ft |
| Critical Slope | 0.010 ft/ft |

# Worksheet for DP-2

| Project Description | |
|---|---|
| Friction Method | Manning Formula |
| Solve For | Normal Depth |

| Input Data | |
|---|---|
| Roughness Coefficient | 0.015 |
| Channel Slope | 0.015 ft/ft |
| Diameter | 8.0 in |
| Discharge | 0.05 cfs |

| Results | |
|---|---|
| Normal Depth | 1.1 in |
| Flow Area | 0.0 ft² |
| Wetted Perimeter | 0.5 ft |
| Hydraulic Radius | 0.7 in |
| Top Width | 0.46 ft |
| Critical Depth | 1.2 in |
| Percent Full | 13.8 % |
| Critical Slope | 0.009 ft/ft |
| Velocity | 1.80 ft/s |
| Velocity Head | 0.05 ft |
| Specific Energy | 0.14 ft |
| Froude Number | 1.261 |
| Maximum Discharge | 1.38 cfs |
| Discharge Full | 1.28 cfs |
| Slope Full | 0.000 ft/ft |
| Flow Type | Supercritical |

| GVF Input Data | |
|---|---|
| Downstream Depth | 0.0 in |
| Length | 0.0 ft |
| Number Of Steps | 0 |

| GVF Output Data | |
|---|---|
| Upstream Depth | 0.0 in |
| Profile Description | N/A |
| Profile Headloss | 0.00 ft |
| Average End Depth Over Rise | 0.0 % |
| Normal Depth Over Rise | 13.8 % |
| Downstream Velocity | Infinity ft/s |
| Upstream Velocity | Infinity ft/s |
| Normal Depth | 1.1 in |
| Critical Depth | 1.2 in |
| Channel Slope | 0.015 ft/ft |
| Critical Slope | 0.009 ft/ft |

# Worksheet for DP-3

| Project Description | |
|---|---|
| Friction Method | Manning Formula |
| Solve For | Normal Depth |

| Input Data | |
|---|---|
| Roughness Coefficient | 0.015 |
| Channel Slope | 0.017 ft/ft |
| Diameter | 8.0 in |
| Discharge | 0.02 cfs |

| Results | |
|---|---|
| Normal Depth | 0.7 in |
| Flow Area | 0.0 ft² |
| Wetted Perimeter | 0.4 ft |
| Hydraulic Radius | 0.5 in |
| Top Width | 0.38 ft |
| Critical Depth | 0.8 in |
| Percent Full | 8.9 % |
| Critical Slope | 0.010 ft/ft |
| Velocity | 1.44 ft/s |
| Velocity Head | 0.03 ft |
| Specific Energy | 0.09 ft |
| Froude Number | 1.262 |
| Maximum Discharge | 1.45 cfs |
| Discharge Full | 1.35 cfs |
| Slope Full | 0.000 ft/ft |
| Flow Type | Supercritical |

| GVF Input Data | |
|---|---|
| Downstream Depth | 0.0 in |
| Length | 0.0 ft |
| Number Of Steps | 0 |

| GVF Output Data | |
|---|---|
| Upstream Depth | 0.0 in |
| Profile Description | N/A |
| Profile Headloss | 0.00 ft |
| Average End Depth Over Rise | 0.0 % |
| Normal Depth Over Rise | 8.9 % |
| Downstream Velocity | Infinity ft/s |
| Upstream Velocity | Infinity ft/s |
| Normal Depth | 0.7 in |
| Critical Depth | 0.8 in |
| Channel Slope | 0.017 ft/ft |
| Critical Slope | 0.010 ft/ft |

# COYOTE CREEK FILING NO. 4
# STORM WATER MANAGEMENT PLAN

November 2021

Prepared For:
Lupton Land, LLC
10221 Prestwick Trail
Lone Tree, CO 80124
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Contact: Bob Quinette

Prepared By:
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(Project No. 16093.00)

**CERTIFICATION**

**I hereby affirm that this Stormwater Management Plan for the Coyote Creek Filing No. 4 project was prepared under my direct supervision in accordance with the provisions of the Colorado Water Quality Control Act and the City of Fort Lupton. JR Engineering does not and will not assume liability for the implementation of the methods, requirements and standards set forth in this report.**

_____

Andrew Jonathan Hugill, P.E.
For and On Behalf of JR Engineering

# TABLE OF CONTENTS

1.0 SITE DESCRIPTION ..... 1
1.1. Introduction ..... 1
1.2. Current Conditions ..... 1
1.3. Nature and Purpose of Construction ..... 1
1.4. Wetlands and Receiving Waters ..... 2
1.5. Rainfall Erodibility & Erosion Sediment Control Methods ..... 2
1.6. Non-Stormwater Discharge ..... 3
2.0 STORMWATER MANAGEMENT CONTROLS ..... 4
2.1. Controls Overview ..... 4
2.2. Erosion and Sediment Controls ..... 4
2.2.1. Structural Practices (See drawings for locations) ..... 4
2.2.2. Non-Structural Practices (See drawings for locations) ..... 6
2.2.3. Other Controls (See drawings for location) ..... 7
2.3. SWMP Administrator ..... 7
2.4. Materials Management ..... 8
2.4.1. Potential Pollution Sources ..... 8
2.4.2. Pollution Prevention Measures ..... 8
2.5. Spill Management ..... 12
3.0 Dry Land Vegetation ..... 14
3.1. Soil and Surface Conditions ..... 14
3.2. Seed Mixes ..... 14
3.3. Mulches ..... 14
4.0 Detailed Sequence of Construction Activities ..... 14
5.0 Inspection and Maintenance ..... 15
5.1. Inspection and Maintenance Overview ..... 15
5.2. Final Stabilization and Long Term Stormwater Management ..... 17
6.0 CONCLUSION ..... 18
7.0 REFERENCES ..... 19

# APPENDICES

Appendix

A. Figures
    i. Vicinity Map
    ii. Soils Map
    iii. FIRM Map
B. Erosion Control Plans

# 1.0 SITE DESCRIPTION

## 1.1.Introduction

This report represents the Stormwater Management Plan for construction of Coyote Creek Filing No. 4. It was prepared to meet the regulatory requirements of the Colorado Department of Health, Water Quality Control Division in compliance with the provisions of the Colorado Water Quality Control Act, and the Federal Water Pollution Control Act.

This plan serves as a consolidated document for information on water quality protection for the subject site and areas immediately adjacent. It should also be noted that this plan is a living document that will need to be updated and maintained throughout the construction process. The intent of this plan is to provide the contractor a tool to consolidate records, logs, permits, applications, etc. as well as guidance on water quality protection. The plan incorporates elements that can be found in the contract plans and specifications as well as in the City of Fort Lupton Design Criteria Manual and Construction Specifications.

## 1.2.Current Conditions

Coyote Creek Filing No. 4 is a proposed single-family residential Planned Unit Development (PUD) located within Section 5, Township 1 North, Range 66 West of the 6$^{th}$ Principal Meridian, City of Fort Lupton, Weld County, Colorado.

The approximately 13-acre site is bounded by the Shortline Ditch regional channel to the west, Twombly Elementary School to the north, and Coyote Creek Golf Course to the southeast and 4$^{th}$ St. to the south. The site is located roughly 1,000 feet north of 1$^{st}$ St. and 600 feet south of 9$^{th}$ St. A vicinity map is included in Appendix A. The site is located within the Coyote Creek Subdivision with the Vincents East Subdivision directly to the west.

The site is composed of type B soils which are characterized as having a moderate infiltration rate when thoroughly wet. Approximately 90 percent of the site is covered in native grasses with the ground generally sloping from east to west between zero and 3 percent.

The proposed use for this site will be a residential subdivision composed of 59 single-family detached units with a local park. There is a 30” irrigation line bisecting the approximate center of the site from east to west.

## 1.3.Nature and Purpose of Construction

The proposed 4$^{th}$ Filing improvements will consist of 59 single family residential lots, including roadways, sidewalks, and utilities including, but not limited to, sanitary sewer, potable water, non-potable water and storm sewer.

### 1.4.Wetlands and Receiving Waters

The contributing area is composed of on-site basins. The contributing area has slopes of 0.5% to 5% with the whole range distributed throughout the entire site. All of the proposed 4th Filing development will be routed directly to a regional detention facility constructed by the City of Fort Lupton. The proposed system will consist of overland flow across proposed lots to various low points and a subsurface piped storm system. The site will be developed with access off of both 4$^{th}$ and 9$^{th}$ St. The site will consist of 59 single family-lots. The majority of the runoff from the site will be conveyed west of the site to the existing Shortline Ditch. From there on, stormwater will be routed north to a regional detention pond. There are no major basin problems affecting the site.

The site lies within Zone X, which delineates areas determined to be outside the flood plain with 0.2% annual chance of flooding. The FEMA FIRMETTE MAP can be seen in Appendix A.

### 1.5.Rainfall Erodibility & Erosion Sediment Control Methods

Attached at the end of the this report is a drawing that describes the proposed site conditions, as well as the locations of the erosion control Best Management Practices (BMPs). The Erosion Control Plan depicts the anticipated drainage patterns after major grading activities and the anticipated locations for BMPs such as silt fence, inlet protection, and staging areas. It has been assumed that the majority of the surrounding areas will remain in their present state during the construction of this project.

The Contractor will be responsible for implementing and maintaining the erosion and sediment control measures described in the document and the accompanying design drawings. The Contractor may designate these tasks to certain subcontractors as he sees fit, but the ultimate responsibility for implementing these controls and their proper function at each phase of the project remains with the Contractor. The order of major activities will be as follows:

1. Install vehicle tracking control and other perimeter soil erosion control measures.
2. Clear and rough grade for improvements.
3. Excavate and install improvements including underground piping, manholes, and drainage structures.
4. Fine grading.
5. Final stabilization.
6. Clean up.

**Construction Sequence Chart**

| | *Mobilization* | *Demolition* | *Grading* | *Utilities Installation* | *Flat work Installation* | *Vertical Installation* | *Landscape* | *Demobilization* |
|---|---|---|---|---|---|---|---|---|
| **Best Management Practices (BMPs)** | | | | | | | | |
| **Structural "Installation"** | | | | | | | | |
| Silt Fence Barriers* | ■ | ■ | ■ | ■ | ■ | ■ | | |
| Vehicle Tracking Pad* | ■ | ■ | ■ | ■ | | | | |
| Inlet Filter Bags* | Any prior inlets that could use protecting | | | ■ | ■ | ■ | ■ | |
| Rock Bags* | Any prior inlets that could use protecting | | | ■ | ■ | ■ | ■ | |
| Rip Rap | | | | ■ | ■ | ■ | ■ | ■ |
| Collecting Asphalt / Concrete Saw Cutting Waste | | ■ | | ■ | ■ | | | |
| *All BMPs to be Removed once Construction is Complete. | | | | | | | | |
| **Vegetative** | | | | | | | | |
| Temporary Seeding Planting | | Any time the site will sit dormant longer than 30 Days. | | | | | | |
| Mulching/Sealant | | Any time the site will sit dormant longer than 30 Days. | | | | | ■ | ■ |
| Permanent Seeding Planting | | | | | | | ■ | ■ |
| Sod Installation | | | | | | | ■ | ■ |
| Rolled Products : Netting/Blankets/Mats | | Any time the site will sit dormant longer than 30 Days. | | | | | ■ | ■ |

### 1.6.Non-Stormwater Discharge

Non-stormwater discharges will be eliminated or reduced to the fullest extent feasible. This plan does not cover construction dewatering. Pumping or draining groundwater that has infiltrated into an excavation requires a general permit for construction dewatering, regardless of the size of the project. Stormwater that mixes with groundwater in an excavation is also subject to the controls in the general permit for Construction Dewatering.

No materials shall be discharged in quantities that will have an adverse effect on the receiving waters. The measures listed below will be implemented to achieve these objectives.

- Proper and lawful disposal of all waste materials.
- Control any spills and leaks that may occur and clean up (mitigate).
- Use of designated areas for equipment repair and cleaning.
- Careful application of irrigation water.

All potential pollutants used during construction other than sediment, will be handled and disposed of in a manner that does not contaminate storm water.

All materials used during construction, which have the potential to impact storm water quality will be stored, managed, used and disposed of in a manner that minimizes the potential for releases to the environment, especially storm water.

# 2.0 STORMWATER MANAGEMENT CONTROLS

## 2.1.Controls Overview

During construction, several controls and measures shall be implemented under the direction of the General Contractor to prevent offsite discharge of contaminated storm water. Controls for this project include erosion, sedimentation, stabilization, and other BMPs. Specifications and engineering drawings for the selected BMPs can be found on the drawing included in the back pocket of this report.

The contractor shall comply with the attached plans and guidelines as a minimum. Field conditions and unforeseen circumstances will dictate modifications to or additions to this Stormwater Management Plan. Where storm water pollution potential exists, appropriate preventative measures (BMPs) must be utilized and documented, whether such measures are identified in this report or not.

## 2.2.Erosion and Sediment Controls

The objective of erosion control is to limit the amount of erosion occurring on disturbed areas until the site is stabilized. The objective of sediment control is to capture the soil that has been eroded before it leaves the construction site. Despite the use of both erosion and sediment control measures, it is recognized that some sediment could remain in runoff leaving the construction site. This should be minimized to the maximum extent practicable.

The BMPs scheduled for use during the construction of this site can be divided into Structural and Non-Structural Practices. Section 2.2.1 of this report discusses the proposed structural BMPs to be utilized. Section 2.2.2 discusses the non-structural practices.

### 2.2.1. Structural Practices (See drawings for locations)

Structural BMPs are structural site management practices that will minimize erosion and sediment transport. Such practices may include silt fences, drainage swales, inlet protections, outlet protection, etc. The goal of structural BMPs on this project is to protect areas downstream of the site from turbid water, sediment, oils and other contaminants, which may mobilize during storm water flows. The structural BMPs that may be utilized on the subject site are depicted in the Drainage and Erosion Control Plan and are described in more detail as follows:

Silt Fence:

- A temporary vertical barrier of filter fabric attached to and supported by posts and entrenched into the ground.
- Utilized to intercept sediment from disturbed areas during construction operations.
- Used to filter shallow sheet flow.
- Typically used along the toe of fills, in transition areas between cut and fills, and adjacent to streams.
- Generally installed prior to or immediately following land-disturbance activity.
- Shall be inspected periodically and after each rain or snowfall event and repaired when necessary. Sediment shall be removed from behind the fence when it accumulates to one-half the exposed fabric height. Sediments removed must be properly disposed.
- Utilized as a temporary feature.

Inlet Protection:

- A barrier across or around a storm drain drop inlet, a curb inlet, or a culvert inlet.
- Utilized to intercept and filter sediment-laden runoff and prevent it from entering storm drainage systems.
- Not to be utilized in place of a sediment-trapping device. Used as a secondary control device.
- Do not use where ponded water might flow onto the roadway.
- Blocking of the inlet should not be watertight.
- Generally installed prior to land-disturbance activity on existing inlets and immediately after the construction of new inlets.
- Shall be inspected periodically and after each rain or snowfall event and repaired when necessary. Accumulated sediment shall be removed and properly disposed.
- Utilized as a temporary feature.

Outlet Protection:

- A structurally lined apron (generally with riprap, grouted rip rap, or concrete) placed at the outlet of pipes or paved channel sections.
- Used as an energy dissipation device to prevent scour and erosion at the outlet by reducing the velocity and energy of concentrated flow.
- Shall be installed immediately following the construction of the upstream conveyance element.
- Inspection shall be performed after high flows for scour and dislodged stones. Repairs shall be made immediately.
- Utilized as a permanent feature.

Grading Techniques:

- Soil surface roughening, terracing and rounding at tops of cuts, transitions and roadway ditches to facilitate plant establishment and minimize erosion.
- Utilized to temporarily stabilize disturbed areas and protect from wind and water erosion immediately after grading activities have ceased.
- Used as a temporary practice during construction.
- Inspection and maintenance must be provided periodically and after each rain or snowfall event that causes runoff to ensure roughened state is maintained.
- Rills developed should be filled and the area re-graded immediately.

Erosion control measures are the responsibility of the General Contractor to inspect and maintain. Any existing erosion control devices that are removed in order to complete the construction of the utilities shall be replaced immediately following the construction that required its removal unless directed otherwise by the *construction plans.*

### 2.2.2. Non-Structural Practices (See drawings for locations)

Non-Structural BMPs are both interim and permanent stabilization practices. Such practices may include temporary seeding, permanent seeding, mulching, geotextiles, sod stabilization, vegetative buffer strips, tree protection, preservation of mature vegetation, etc. The non-structural BMPs that may be utilized on the subject site are described in more detail as follows:

Temporary and Permanent Seeding:

- Soil preparation, seeding, mulch tackifier and/or mulching shall be required for all disturbed areas that are not hardscaped, paved, stabilized.
- Exposed soils, which are not part of the active grading and/or construction activity, shall be stabilized.
- Seeded areas shall be inspected frequently. If the seeded areas fail to establish, provide adequate ground coverage. If seeded areas are disturbed, the area should be re-seeded.
- Permanent landscaping and vegetative cover is depicted on the Landscaping plans.

Mulching:

- Application of plant residues to the soil surface. Typical mulching material includes certified weed free hay or straw, certified under the Colorado Department of Agriculture Weed Free Forage Certification Program as regulated by the Weed Free Forage Act, Title 35, Article 27.5, CRS and wood cellulose fiber.
- Utilized in combination with mulch tackifier for temporary erosion control (i.e., incomplete slopes, detour slopes, stockpiles).
- Utilized in combination with mulch tackifier for temporary erosion control on slopes when seeding is not allowed due to seasonal constraints.
- Used to cover permanent or temporary seed areas. Hydromulch shall not be done in the presence of free surface water.

- Inspect frequently and reapply mulching in areas where the mulching has been loosened or removed. Mulch tackifier must be applied with additional applications of mulching.

Mulch Tackifier:

- An organic soluble powder adhesive used as a water slurry to adhere native hay, straw, hydromulch, or seed to a surface and together.
- Used to cover disturbances as temporary cover for wind erosion.
- Mulch movement indicates poor application and procedure mixture.
- Proper application will bond mulch material together and to soil.
- Inspect by touching mulch surface to determine if adhesion has occurred.

Maintain Existing Vegetation:

- Existing vegetation should be preserved where possible to prevent the migration of sediment.
- Should be inspected regularly.
- Establish and maintain buffers.
- Areas beginning to show signs of erosion or soil transport may require additional emergency BMPs.

### 2.2.3. Other Controls (See drawings for location)

Vehicle Tracking Control / Construction Entrance:

- A temporary stabilized layer of aggregate underlined with geotextile or gravel located where traffic enters or exits the construction site.
- The structure shall be constructed prior to any construction activity and maintained daily.
- Stone shall be added and repairs performed as conditions require.
- When mud is present and not easily removed by a tracking pad, tire washing should be implemented as needed. Tire washing operations should occur near the construction exit on a stabilized stone pad. Implementation of a tire washing area should include provisions for collecting wash water and directing it to an onsite pond.

Tracking of Sediment onto Roads and Streets:

- Public and private roadways shall be kept clear of accumulated sediment. Bulk clearing of accumulated sediment shall not include flushing the area with water. Sediment will be shoveled and or swept from the street and disposed of in a manner that prevents contamination of storm water or surface water runoff.

## 2.3.SWMP Administrator

Implementation and management of the environmental aspects of this project under this SWMP Plan are the responsibilities of the General Contractor. The General Contractor shall ensure the all contractors providing services on the project have

access to a copy of the SWMP Plan and appropriate training regarding storm water pollution prevention. The General Contractor, Building Contractor, Utility Installations Contractor, Grading Contractor and all other contractors and subcontractors shall be familiar with the SWMP Plan and their responsibilities on the plan.

## 2.4.Materials Management

### 2.4.1. Potential Pollution Sources

It is anticipated that this construction project will not utilize any abnormal or atypical hazardous materials. The construction site will operate much like other typical construction projects. The following materials or substances are expected to be present onsite during construction:

| | |
|---|---|
| Concrete/Additives/Wastes | Cleaning solvents |
| Detergents | Petroleum based products |
| Paints/Solvents | Pesticides |
| Acids | Fertilizers |
| Solid and construction wastes | Sanitary wastes |
| Soil stabilization additives | |

Activities on the site that may have an impact on stormwater include the following:

- Equipment and/or vehicle washing
- Fertilizers, chemicals, or other material storage
- Vehicle maintenance or fueling
- Waste incineration, treatment, storage or disposal
- Off-site vehicle tracking
- Loading/unloading areas
- Concrete truck washout

As construction progresses, specific areas shall be designated for vehicle maintenance and refueling, material and waste storage, construction equipment staging, and bathroom facilities. Management measures and procedures for these facilities are discussed later in the plan.

### 2.4.2. Pollution Prevention Measures

Pollution prevention measures shall be utilized to prevent construction materials with the potential of polluting stormwater, such as those listed above, from coming in contact with runoff. Measures include good housekeeping and proper disposal of construction and demolition debris, equipment fuel, lubricants, paints and solvents, asphalt, concrete, topsoil and other materials, as well as controls which prevent

sediments from being tracked off-site by construction vehicles, and proper control of any non-stormwater flows on-site.

As previously stated, Best Management Practices (BMPs) are schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce pollution of public waters. BMPs also control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. With regard to construction, these may include structural controls and nonstructural practices that are designed to prevent pollutants from entering water or direct the flow of water away from potential sources of pollution.

For construction sites, there are three main types of BMPs, those that prevent erosion and sediment transport, others that prevent pollutants from construction materials from mixing with stormwater, and those that trap pollutants before they can be discharged. BMPs for most common construction materials and wastes with the greatest potential for adversely affecting stormwater quality are as follows:

BMPs for Disturbed and Stored Soils:

- Seeding and mulching should be completed for the site
- Soil preparation, seeding, mulch tackifier and/or mulching shall be required for all disturbed areas that are not surfaced.
- Exposed soils, which are not part of the active grading and/or construction activity, shall be stabilized.
- Seeded areas shall be inspected frequently. If the seeded areas fail to establish, provide adequate ground coverage. If seeded areas are disturbed, the area should be re-seeded.
- Permanent landscaping and vegetative cover is depicted on the Landscaping plans.

BMPs for Vehicle Tracking of Sediment:

- Use vehicle tracking pads at the entrances of construction
- Public and private roadways shall be kept clear of accumulated sediment. Bulk clearing of accumulated sediment shall not include flushing the area with water. Sediment will be shoveled and or swept from the street and disposed of in a manner that prevents contamination of storm water or surface water runoff.
- A temporary stabilized layer of aggregate underlined with geotextile or gravel located where traffic enters or exits the construction site.
- The structure shall be constructed prior to any construction activity and maintained daily.
- Stone shall be added and repairs performed as conditions require.
- When mud is present and not easily removed by a tracking pad, tire washing should be implemented as needed. Tire washing operations should occur near the construction exit on a stabilized stone pad. Implementation of a tire washing area should include provisions for collecting wash water and directing it to an onsite pond

BMPs for Management of Contaminated Soils:

- Have equipment to contain and clean up spills of hazardous materials in the vicinity of where these materials are to be stored or used.
- Contain and clean up spills immediately after they occur. Contact State or Local solid waste regulatory agency concerning information and procedures necessary to treat or dispose of contaminated soils.
- Keep materials in a dry covered area and elevated from the ground.

BMPs for Loading and Unloading Operations:

- Select a loading and unloading area for the site

BMPs for Outdoor Storage Activities:

- Select an outdoor storage area for the site
- When possible store equipment and material in covered areas

BMPs for Equipment Maintenance and Fueling:

- Fueling operations shall occur in a designated area.
- Have equipment to contain and clean up petroleum spills in fuel storage areas or on board maintenance and fueling vehicles.
- Where possible, store petroleum products and fuel vehicles in covered areas and construct dikes to contain spills.
- Contain and clean up spills immediately.
- Use preventive maintenance for onsite equipment such as checking for and fixing gas and oil leaks in construction vehicles on a regular basis.
- Follow proper procedure for the handling and application of asphaltic substances.
- Oversee all filling operations.
- Fueling equipment and area shall be fenced and valving locked to prevent vandalism.

BMPs for Significant Particulate Generating:

- Use silt fence and inlet protection to protect the areas downstream of the site
- Maintain and clean out any sediment that builds up around the inlet protection and silt fence

BMPs for On-Site Waste Management:

- Select a designated waste collection area onsite.
- Provide an adequate number of containers with lids or covers that can be placed over the containers prior to rainfall.
- When possible, locate containers in a covered area.
- Arrange for waste collection before containers overflow.
- If a container does spill, provide cleanup immediately.
- Plan for additional containers and more frequent pickups during the demolition phase of construction.

- Make sure that construction waste is collected, removed, and disposed of only at authorized disposal areas.
- Check with local solid waste management agency for specific guidance.
- Trash, debris and spoils shall be properly contained at the END of EACH day.

BMPs for residual Concrete disposal:

- Emptying or wash out of excess concrete may be allowed on site. Excess concrete and wash water should be disposed of in a manner that prevents contact between these materials and stormwater discharges from the site.
- Residual concrete shall be discharged in specifically designated dike areas, which have been prepared to prevent contact between the concrete and/or washout and stormwater discharged from the site and/or ground water.
- The hardened residue from the dike areas shall be disposed of in the same manner as other non-hazardous construction waste materials or may be broke up and utilized as deemed appropriate by the contractor.
- The use of the washout area shall be temporary (less than one year).
- Washing of trucks and masonry equipment is to be performed only at a designated concrete washout. No burying of wastes.

BMPs for Sanitary/Septic Wastes:

- Sanitary or septic wastes that are generated onsite should be treated or disposed of in accordance with State or local requirements.
- If self-contained, temporary facilities are utilized, the domestic waste haulers should be contracted to regularly remove the sanitary and septic wastes and to maintain the facilities in good working order.
- Any facilities to be connected to a sanitary sewer system should be properly hooked to the sanitary sewer system to prevent illicit discharges.
- Untreated, raw sewage should never be discharged or buried onsite.
- Contact local government and State regulatory agencies to ensure the compliance with State or local requirements.
- If sewage is being discharged to the sanitary sewer, the local treatment works authority should be contacted.

BMPs for pesticides:

- Store pesticides in a dry covered area and elevate above the ground.
- Provide curbs or dikes to contain possible spills.
- Have measures on site to contain and clean up spills.
- Strictly follow recommended application rates and recommended application methods.
- Only a Certified Applicator shall use pesticides.

BMPs for Fertilizers/Detergents:

- Limit the application of fertilizers to the minimum area and minimum recommended amounts.

- Reduce exposure of nutrients to storm water runoff by working the fertilizer deep into the soil.
- Apply fertilizer more frequently, but at lower application rates.
- Hydro seeding, where lime and fertilizers are applied to the ground surface in one application should be limited, where possible.
- Limit the use of detergents onsite: wash water containing detergents should not be discharged to the storm system.
- Implement good erosion and sediment control to help reduce the amount of fertilizers that can leave the site as well as sediments.
- Fertilizers and detergents shall be stored in dry and covered area and elevated above the ground.
- Berming shall be provided around the storage area to avoid contact with stormwater runoff.

BMPs for Hazardous Wastes Disposal:

- Check with local waste management authorities to determine what the requirements are for disposing of hazardous materials.
- Use the entire product before disposing of the container.
- Do not remove the original product label from the container. It contains important information.
- Do not mix products together unless specifically recommended by the manufacturer.
- The correct disposal of these products varies with the product utilized. Follow the manufacturers recommended method, which is often found on the label.

### 2.5.Spill Management

Construction site supervisors should create and adopt a spill control plan that includes measures and procedures to stop the source of the spill, contain the spill, clean up, and disposal of contaminated materials. Key personnel shall be identified and trained to be responsible for spill prevention and control. The following measures would be appropriate for a spill prevention and response plan:

- Store and handle materials to prevent spills.
    - Tightly seal containers.
    - Make sure all containers are clearly labeled.
    - Stack containers neatly and securely
    - Where possible, store containers on pallets in a covered area.
- Reduce stormwater contact if there is a spill.
    - Have cleanup procedures clearly posted.
    - Have cleanup materials readily available.
    - Contain any liquid.
    - Stop the source of the spill.
    - Cover spill with absorbent material.
- Dispose of contaminated materials according to manufacturer's instructions or according to State or local requirements.

- Identify personnel responsible for responding to a spill of toxic or hazardous materials.
    - Provide personnel spill response training.
    - Post names of spill response personnel.
- Keep the spill area well ventilated.

Additionally, records of spills, leaks, or overflows that result in the discharge of pollutants must be documented and maintained. Information such as the time and date, weather conditions, response procedure taken, response personnel involved, reasons for the spill, etc., shall be recorded for all occurrences in the SWMP Plan and on the map.

Spill Categories are as follows:

Minor Spills

- Any event that involves 5 gallons or more and or involves the following:
- Less than the reportable quantity
- Stays within the permitted area
- Does not threaten any stormwater conveyances

Significant Spills

- Reportable Quantity (SARA title III List of Lists, available from EPA for reportable quantity)
- Any amount leaving the permitted area
- And/or threatens any water conveyances.

Hazardous Spills

- Any substance requiring a MSDS response.
- Procedure shall include but limited to:
    - Secure the area
    - Provide first aid
    - Notify emergency response personnel

Some spills may need to be reported to the Division of Water Quality and the City of Fort Lupton immediately. Specifically significant spills that are, a release of any chemical, oil, petroleum product, sewage, etc., which may enter waters of the State of Colorado (which include surface water, ground water and dry gullies or storm sewers leading to surface water), any spill that exceeds the reportable quantity, and any amount that leaves the permitted area must be reported. The Division's toll-free 24-hour environmental emergency spill reporting line is 1-877-518-5608. Written documentation to both the CDPHE (Division) and the City of Fort Lupton of significant spills should be provided within 5 days.

# 3.0 Dry Land Vegetation

### 3.1.Soil and Surface Conditions

The Coyote Creek Filing No. 4 site consists of Nelson fine sandy loams and Olney fine sandy loams, which the USDA-NSCS classifies as Type B soils. Type B soils have a moderated infiltration rate when thoroughly wet and chiefly consist of soils that have moderately fine texture to moderately coarse texture. See Appendix A for the soil map.

### 3.2.Seed Mixes

A standard City of Fort Lupton seed mix should be used for the site. If a standard mix is not used than a request to the City must be submitted of the preferred seed mix with the application rates.

### 3.3.Mulches

Typical mulching material includes certified weed free hay or straw, certified under the Colorado Department of Agriculture Weed Free Forage Certification Program as regulated by the Weed Free Forage Act, Title 35, Article 27.5, CRS and wood cellulose fiber. Mulch should be utilized in combination with mulch tackifier for temporary erosion control (i.e., incomplete slopes, detour slopes, stockpiles) when seeding is not allowed due to seasonal constraints. Mulch is also used to cover permanent or temporary seed areas. The mulch should be inspected frequently and reapplied in areas where the mulch has been loosened or removed. Mulch tackifier must be applied with additional applications of mulching.

# 4.0 Detailed Sequence of Construction Activities

**Sequence of Land Disturbing Activity Chart**

| | *Mobilization* | *Demolition* | *Grading* | *Utilities Installation* | *Flat work Installation* | *Vertical Installation* | *Landscape* | *Demobilization* |
|---|---|---|---|---|---|---|---|---|
| **Best Management Practices (BMPs)** | | | | | | | | |
| **Structural "Installation"** | | | | | | | | |
| Silt Fence Barriers* | ■ | ■ | ■ | ■ | ■ | ■ | | |
| Vehicle Tracking Pad* | ■ | ■ | ■ | ■ | | | | |
| Inlet Filter Bags* | Any prior inlets that could use protecting | | | ■ | ■ | ■ | ■ | |
| Rock Bags* | Any prior inlets that could use protecting | | | ■ | ■ | ■ | ■ | |
| Rip Rap | | | | ■ | ■ | ■ | ■ | ■ |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Collecting Asphalt / Concrete Saw Cutting Waste | | | | | | | | |
| *All BMPs to be Removed once Construction is Complete. | | | | | | | | |
| **Vegetative** | | | | | | | | |
| Temporary Seeding Planting | | Any time the site will sit dormant longer than 30 Days. | | | | | | |
| Mulching/Sealant | | Any time the site will sit dormant longer than 30 Days. | | | | | | |
| Permanent Seeding Planting | | | | | | | | |
| Sod Installation | | | | | | | | |
| Rolled Products : Netting/Blankets/Mats | | Any time the site will sit dormant longer than 30 Days. | | | | | | |

# 5.0 Inspection and Maintenance

## 5.1.Inspection and Maintenance Overview

A site inspection of all erosion control facilities shall be conducted at least once every two weeks and immediately following any significant precipitation or snowmelt event that could cause surface erosion and every 30 days for inactive construction projects. The inspection must determine if there is evidence of, or the potential for, pollutants entering the drainage system, and BMPs should be reviewed to determine if they still meet the design and operational criteria in the SWMP Plan and that they continue to adequately control pollutants at the site. The construction site perimeter, disturbed areas, discharge points and areas used for material storage that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the storm drainage system. Erosion and sediment control measures identified in this SWPM Plan and on the construction plans shall be observed to ensure that they are operating correctly. Any other structural BMPs that may require maintenance, such as secondary containment around fuel tanks or the conditions of spill response kits shall also be inspected. Stormwater items to be inspected include the following:

- Condition & failures of structural & non-structural BMPSs
- Perimeter and outfall structure
- Evidence of spills, upsets & discharges
- Maintaining accurate SWMP Plan documentation
- Material Handling and storage
- Good Housekeeping
- Site Stabilization
- Meet authorities during inspections
- Update permit disturbed acreage
- Equipment and vehicle storage area
- Maintenance records of equipment, systems & operations

The project site and the adjacent streets impacted by the construction shall be kept neat, clean and free of debris. The control measures and facilities need to be maintained in good working order. Any items that are not functioning properly or are inadequate should be promptly repaired or upgraded. The site shall be inspected by responsible personnel who are familiar with the site. Inspection and monitoring will follow the procedures outlined below:

Minimum Monitoring (Inspection) Requirements:

- Inspections of the construction site shall be conducted by the contractor (or agent) every two weeks and after significant storm events.
- The qualified site superintendent familiar with this SWMP Plan /BMP shall perform the inspections.
- The contractor shall certify the site is in compliance with the SWMP Plan /BMP and the permit by:
    - Ensuring that areas contributing significant storm water discharges related to the construction activities have been identified.
    - Evaluating preventive measures required by the SWMP Plan /BMP to insure they are adequate and has been properly implemented.
    - Points of discharge from the site will be inspected to check for signs of pollutant discharge.
    - Certifying the grade elevations and capacity of permanent sedimentation facilities.
    - Determining if additional control measures will need to be implemented.
    - Updating this SWMP Plan if new measures are implemented or existing controls are deleted.

Based on the results of the inspection, the description of potential pollutant sources, and the pollution prevention and control measures that are identified within this plan shall be revised and modified as appropriate and as soon as practicable after such inspection. Typically corrective action shall commence immediately when a deficiency is observed.

In addition to the inspections performed at least every 7 days, several daily inspections will be required. Each day when any type of construction activity has taken place onsite, qualified personnel provided by the General Contractor shall:

- Inspect all onsite areas where petroleum products are stored, used or handled for spills and leaks from vehicles and equipment.
- Inspect all onsite locations where vehicle enter or exit the site for evidence of offsite sediment tracking.

## 5.2.Final Stabilization and Long Term Stormwater Management

Permanent stabilization will be achieved by establishing a vegetative cover on all disturbed areas. The vegetative cover will be as specified on the Landscape Plan. Final stabilization shall be considered complete when all paving and landscaping are completed and the vegetative cover has been established with a density of at least 70 percent of pre-disturbance levels (including shrubs and trees).

In general spring and fall encouraged whenever possible. Temporary and permanent seeding shall be completed within 14 days after grading has ceased and left to idle for more than 30 days. Care should be taken to complete seeding activities prior to November 1st for disturbed land intending to remain inactive for the winter months.

Roughening and scarifying disturbed areas is allowed as a temporary stabilization with the following conditions:

- During winter activity
- Intended to seeded in the spring fall seasons
- Intended to be active within 2-3 months of inactivity (with Stormwater approval)

Management of storm water after completion of construction will be accomplished by utilizing the practices listed below:

- Upon completion of construction, the site shall be inspected to ensure that all equipment, waste materials, and debris have been removed.
- The site will be inspected to make certain that all graded surfaces have been landscaped or seeded with an appropriate ground cover.
- Upon acceptance of final stabilization measures, all temporary BMP's shall be removed and proper function of inlets, drainage ways, or other storm water conveyance elements shall be restored.
- The storm sewer systems and the detention pond will be returned to full capacity and the outlet structures will be checked to assure they are unclogged and in working order.

The General Contractor shall be responsible for maintaining the storm water controls in good working order including removal measures until the Inactivation Notice is filed with the State. The state requires the Inactivation Notice be filed within 3 months of the proposed end of construction. Alternatively, permit responsibilities may be transferred or reassigned by submitting a Notice of Transfer and Acceptance of Terms or a Reassignment of Coverage if control of a portion of the site changes parties.

# 6.0 CONCLUSION

This Stormwater Management Plan has been prepared in accordance with the criteria and methods described in the "State of Colorado General Permit Application and Stormwater Management Plan Guidance for Stormwater Discharges Associated with Construction Activity." The drainage system has been designed to comply with the regulatory requirements of the City of Fort Lupton Design Criteria Manual and Construction Specifications. All temporary and permanent erosion and sediment control BMPs shall be inspected, maintained and repaired by the General Contractor as needed to ensure continued performance of their intended function.

The General Contractor shall remove all temporary erosion and sediment control BMPs after stabilization is achieved or after temporary BMPs are no longer needed. Trapped sediment will be removed by the General Contractor or stabilized onsite. Disturbed soil areas resulting from removal of BMPs will be to be permanently stabilized with vegetation as soon as possible.

# 7.0 REFERENCES

1. Urban Storm Drainage Criteria Manual (Volumes 1, 2, and 3), Urban Drainage and Flood Control District, (Rev. April 2008)

2. "Hydrologic Group Rating for Larimer County Area, Colorado", USDA-Natural Resources Conservation Service, National Cooperative Soil Survey. Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov.

**APPENDIX A**
**Figures**

500 250 0 500

ORIGINAL SCALE: 1" = 500'

APPENDIX A
VICINITY MAP
JOB NO. 16093.00
2021-11-10
SHEET 1 OF 1

J·R ENGINEERING
A Westrian Company

Centennial 303-740-9393 • Colorado Springs 719-593-2593
Fort Collins 970-491-9888 • www.jrengineering.com

Map Scale: 1:2,510 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 35 70 140 210

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

## MAP LEGEND

**Area of Interest (AOI)**

- Area of Interest (AOI)

**Soils**

**Soil Rating Polygons**

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

**Soil Rating Lines**

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

**Soil Rating Points**

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

**Water Features**

- Streams and Canals

**Transportation**

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

**Background**

- Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Weld County, Colorado, Southern Part
Survey Area Data: Version 20, Aug 31, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 19, 2018—Aug 10, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

# Hydrologic Soil Group

| Map unit symbol | Map unit name | Rating | Acres in AOI | Percent of AOI |
|---|---|---|---|---|
| 37 | Nelson fine sandy loam, 0 to 3 percent slopes | B | 6.7 | 41.0% |
| 47 | Olney fine sandy loam, 1 to 3 percent slopes | B | 9.6 | 59.0% |
| **Totals for Area of Interest** | | | **16.2** | **100.0%** |

## Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

## Rating Options

*Aggregation Method:* Dominant Condition

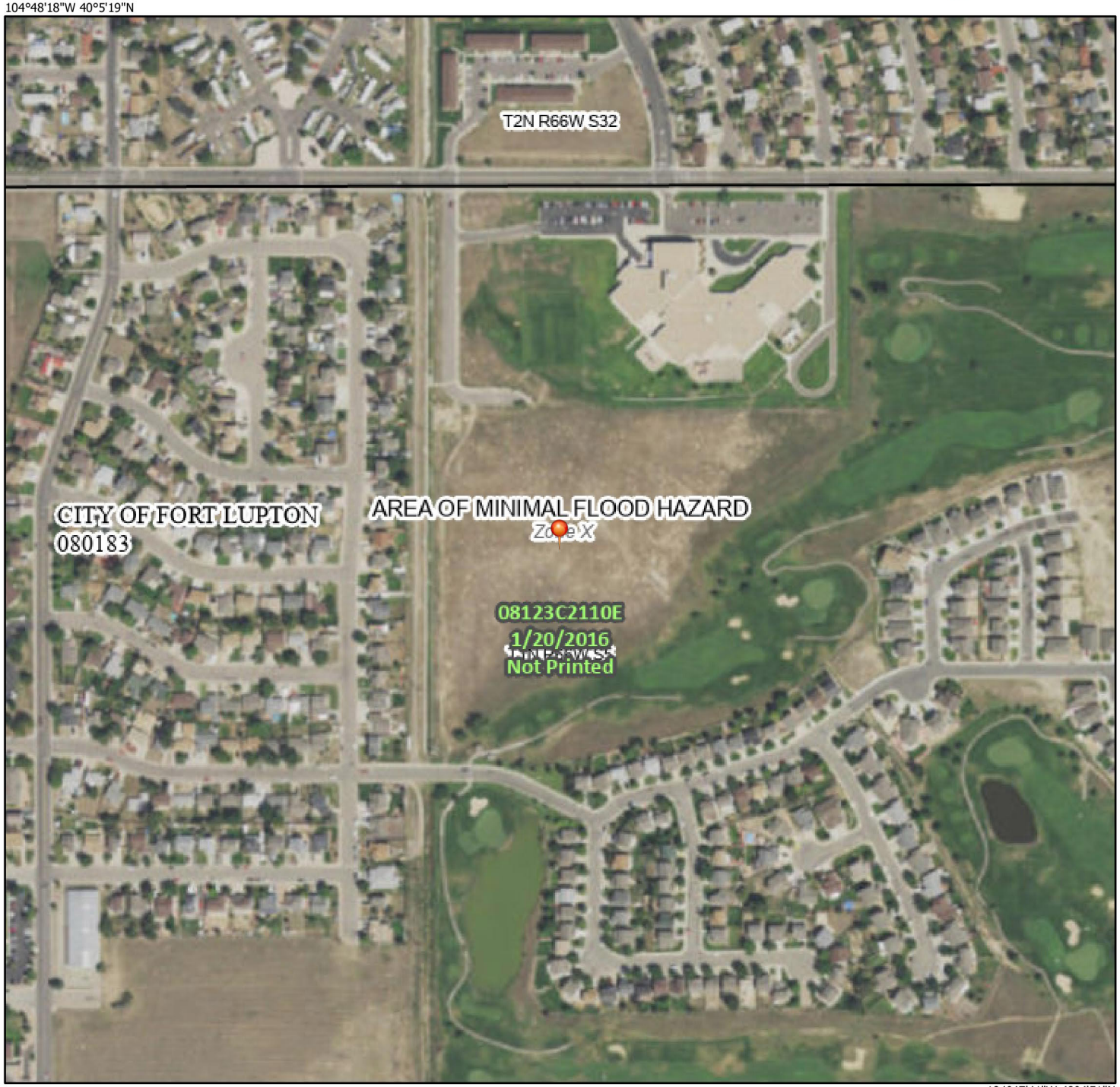
*Component Percent Cutoff: None Specified*

*Tie-break Rule:* Higher

# National Flood Hazard Layer FIRMette

FEMA

104°48'18"W 40°5'19"N




104°47'41"W 40°4'51"N

Feet

0 250 500 1,000 1,500 2,000

1:6,000

*Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020*

## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

**SPECIAL FLOOD HAZARD AREAS**
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

**OTHER AREAS OF FLOOD HAZARD**
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

**OTHER AREAS**
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

**GENERAL STRUCTURES**
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

**OTHER FEATURES**
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

**MAP PANELS**
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

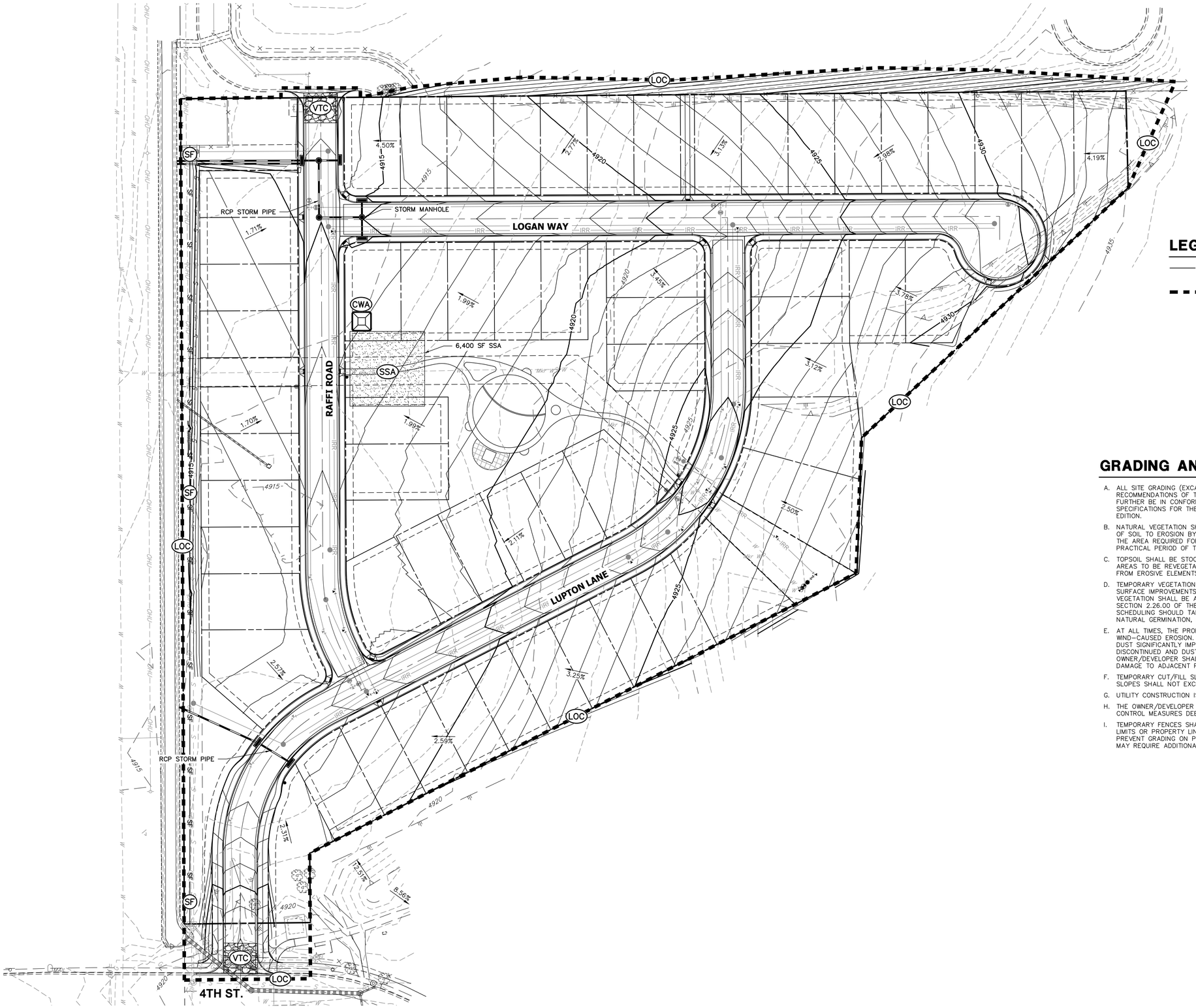
This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 11/16/2021 at 11:30 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

**APPENDIX B**
**Erosion Control Plans**

# COYOTE CREEK FILING NO. 4




## LEGEND

- SF — SILT FENCE
- LOC — LIMITS OF CONSTRUCTION
- VTC — VEHICLE TRACKING CONTROL
- CWA — CONCRETE WASHOUT AREA
- IP — INLET PROTECTION
- SCL — SEDIMENT CONTROL LOG
- SSA — STABILIZED STAGING AREA

## GRADING AND EROSION CONTROL NOTES

A. ALL SITE GRADING (EXCAVATION, EMBANKMENT, AND COMPACTION) SHALL CONFORM TO THE RECOMMENDATIONS OF THE LATEST SOILS INVESTIGATION FOR THIS PROPERTY AND SHALL FURTHER BE IN CONFORMANCE WITH THE CITY OF FORT LUPTON'S "STANDARDS AND SPECIFICATIONS FOR THE DESIGN AND CONSTRUCTION OF PUBLIC IMPROVEMENTS," LATEST EDITION.

B. NATURAL VEGETATION SHALL BE RETAINED AND PROTECTED WHEREVER POSSIBLE. EXPOSURE OF SOIL TO EROSION BY REMOVAL OR DISTURBANCE OF VEGETATION SHALL BE LIMITED TO THE AREA REQUIRED FOR IMMEDIATE CONSTRUCTION OPERATION AND FOR THE SHORTEST PRACTICAL PERIOD OF TIME.

C. TOPSOIL SHALL BE STOCKPILED TO THE EXTENT PRACTICABLE ON THE SITE FOR USE ON AREAS TO BE REVEGETATED. ANY AND ALL STOCKPILES SHALL BE LOCATED AND PROTECTED FROM EROSIVE ELEMENTS.

D. TEMPORARY VEGETATION SHALL BE INSTALLED ON ALL DISTURBED AREAS WHERE PERMANENT SURFACE IMPROVEMENTS ARE NOT SCHEDULED FOR INSTALLATION WITHIN THREE MONTHS. VEGETATION SHALL BE A VIGOROUS, DROUGHT TOLERANT, NATIVE SPECIES MIX. (REFER TO SECTION 2.26.00 OF THESE STANDARDS AND SPECIFICATIONS FOR SEEDING MIX.) PROJECT SCHEDULING SHOULD TAKE ADVANTAGE OF SPRING OR FALL PLANTING SEASONS FOR NATURAL GERMINATION, BUT SEEDED AREAS SHALL BE IRRIGATED, IF CONDITIONS SO MERIT.

E. AT ALL TIMES, THE PROPERTY SHALL BE MAINTAINED AND/OR WATERED TO PREVENT WIND-CAUSED EROSION. EARTHWORK OPERATIONS SHALL BE DISCONTINUED WHEN FUGITIVE DUST SIGNIFICANTLY IMPACTS ADJACENT PROPERTY. IF EARTHWORK IS COMPLETE OR DISCONTINUED AND DUST FROM THE SITE CONTINUES TO CREATE PROBLEMS, THE OWNER/DEVELOPER SHALL IMMEDIATELY INSTITUTE MITIGATIVE MEASURES AND SHALL CORRECT DAMAGE TO ADJACENT PROPERTY.

F. TEMPORARY CUT/FILL SLOPES SHALL NOT EXCEED A STEEPNESS OF 2:1 (2H:1V). PERMANENT SLOPES SHALL NOT EXCEED 4:1 (4H:1V) IN AREAS TO BE SEEDED OR SODDED.

G. UTILITY CONSTRUCTION IS NOT APPROVED UNDER THIS PLAN.

H. THE OWNER/DEVELOPER SHALL PROVIDE ANY ADDITIONAL DUST ABATEMENT AND EROSION CONTROL MEASURES DEEMED NECESSARY BY THE CITY, SHOULD CONDITIONS MERIT THEM.

I. TEMPORARY FENCES SHALL BE INSTALLED ALONG ALL BOUNDARIES OF THE CONSTRUCTION LIMITS OR PROPERTY LINES AS SHOWN ON THE APPROVED EROSION CONTROL PLAN, TO PREVENT GRADING ON PROPERTY NOT OWNED BY THE DEVELOPER. IN ADDITION, THE CITY MAY REQUIRE ADDITIONAL TEMPORARY FENCES IF FIELD CONDITIONS SO MERIT THEM.

N

50 25 0 50 100

ORIGINAL SCALE: 1" = 50'

Know what's **below.**
**Call** before you dig.

UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, JR ENGINEERING APPROVES THEIR USE ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

PREPARED FOR
LUPTON LAND, LLC
10221 PRESTWICK TRAIL
LONE TREE, CO 80124
BOB QUINETTE
P-303.587.1966


J·R ENGINEERING
A Westrian Company
Centennial 303-740-9393 • Colorado Springs 719-593-2593
Fort Collins 970-491-9888 • www.jrengineering.com


| No. | REVISION | BY | DATE |
|---|---|---|---|
| | | | |

| | |
|---|---|
| H-SCALE | 1"=50' |
| V-SCALE | N/A |
| DATE | 11/17/21 |
| DESIGNED BY | AJH |
| DRAWN BY | CRB |
| CHECKED BY | |

COYOTE CREEK FILING NO. 4

PRELIMINARY GRADING & EROSION CONTROL PLAN

SHEET 4 OF 27

JOB NO. 16093.00

# WILL SERVE LETTER

November 11, 2021

Lupton Land LLC
10221 Prestwick Trail
Lone Tree, CO 80124

Re: Coyote Creek Golf Course: Filing Four

Dear Bob Quinette,

This letter is to confirm that Xcel Energy is your utility provider for natural gas. In accordance with our tariffs, on file with and approved by the Colorado Public Utilities Commission, gas facilities can be made available to serve the project at Coyote Creek Golf Course, Filing Four. The cost, and whether any reinforcements or extensions are required, for the Company to provide those facilities will be determined by your designer upon receipt of application and project plans.

Your utility service(s) will be provided after the following steps are completed:

- ***Application submitted to Xcel Energy's "Builders Call Line (BCL)"*** – once your application is accepted you will be assigned a design department representative who will be your primary point of contact
- ***Utility design is completed*** – you must provide your design representative with the site plan, the one - line diagrams, and panel schedules for electric and gas loads if applicable
- ***All documents provided by design representative are signed and returned***
- ***Payment is received*** (Residential Service Laterals if applicable)
- ***Required easements are granted*** - you must sign and return applicable easement documents to your Right-of-Way agent
- ***Site is ready for utility construction*** - the site ready information can be found on our website at may be viewed at Construction and Inspection | Xcel Energy.

An estimated scheduled in-service date will be provided once these requirements have been met. It is important to keep in mind that the terms and conditions of utility service, per our tariffs, require that you provide adequate space and an easement on your property for all gas and electric facilities required to serve your project, including but not limited to gas and electrical lines and meters, transformers, and pedestals. General guidelines for requirements can be found on our website at xcelenergy.com/InstallAndConnect.

Xcel Energy looks forward to working with you on your project and if I can be of further assistance, please contact me at the phone number or email listed below.

Sincerely,

Amy Caswell
Xcel Energy Technician

Mailing address: Public Service Company of Colorado
5460 W 60th Ave
Arvada, CO 80003

November 16, 2021

Lee Eisenheim
Challenger Homes
8605 Exploerer Dr Suite 250
Colorado Springs, CO 80920

Dear Lee Eisenheim:

United Power is the provider of electric service in the area to the proposed Subdivision Coyote Creek, located in the Town of Fort Lupton, County of Weld, state of Colorado.

There is electrical distribution in the area that may or may not need to be upgraded, depending on the requirements of the site, in order to provide capacity and safe reliable power to the area. Service will be provided according to the rules, regulations, and policies in effect by United Power at the time service is requested.

We look forward to this opportunity to provide electric service. If you have any questions, please give me a call at 303-618-2987.
Sincerely,

Michael Neu

Michael Neu
Project Manager - West District
MKN: mz

Fort Lupton Fire Protection District
1121 Denver Avenue • Fort Lupton, Colorado 80621
Office: (303)857-4603 • Fax: (303)857-6619 • Website: www.fortluptonfire.org

**Date:** 12/22/2021
**Project name: Coyote Creek Filing No. 4**
**Project address: Parcel: 147105100053**, Fort Lupton, CO 80621
**FLFPD Project #** R2021-0043
**Plan reviewer: Taw Tamlin, Fire Marshal**

The Fire District has reviewed the submittal for **Coyote Creek Filing No. 4** located at **Parcel: 147105100053,** Fort Lupton, CO 80621. The submittal was reviewed for compliance with *2012 International Fire Code (IFC)* and National Fire Protection Association (*NFPA)* standards as adopted by the Fort Lupton Fire Protection District, the City Council of Fort Lupton and the Weld County Commissioners. The following specific requirements and conditions shall be met prior to operations.

**Specific Requirements**

1. Any property owner or authorized agent who intends to conduct an operation or business, or install or modify systems and equipment which is regulated by this code, or to cause any such work to be done, shall first make application to the fire code official and obtain the required permit.

2. Application for a permit required by this code shall be made to the fire code official in such form and detail as prescribed by the fire code official. Applications for permits shall be accompanied by such plans as prescribed by the fire code official.

    a. *The plan review, Fee Schedule, and Plan Review Application can be found at https://fortluptonfire.org/contractors/*

    b. *All documents shall be electronic and sent to ttamlin@ftluptonfire.com*

3. The following items shall be submitted for review prior to construction.
    a. Site Plan showing,
        i. Width of fire department access roads
        ii. Hydrant Locations & Distancing
        iii. Street lengths to dead end
        iv. Describe how Section D107.1 below has been met.

4. Where a fire hydrant is located on a fire apparatus access road, the minimum road width shall be 26 feet (7925 mm), exclusive of shoulders and parking areas.

5. The minimum turning radius shall be determined by the fire code official. 2012 IFC, D103.3
    a. See attached document showing the minimum turning radius needed.

6. The minimum fire-flow and flow duration requirements for one- and two-family dwellings having a fire-flow calculation area that does not exceed 3,600 square feet (344.5 m2) shall be 1,000 gallons per minute (3785.4 L/min) for 1 hour. Fire-flow and flow duration for dwellings having a fire-flow calculation area in excess of 3,600 square feet (344.5m2) shall not be less than that specified in Table B105.1.

    a. Exception: A reduction in required fire-flow of 50 percent, as approved, is allowed when the building is equipped with an approved automatic sprinkler system.

7. The minimum number of fire hydrants available to a building shall not be less than that listed in Table C105.1. The number of fire hydrants available to a complex or subdivision shall not be less than that determined by spacing requirements listed in Table C105.1 when applied to fire apparatus access roads and perimeter public streets from which fire operations could be conducted.

8. Developments of one- or two-family dwellings where the number of dwelling units exceeds 30 shall be provided with two separate and approved fire apparatus access roads and shall meet the requirements of Section D104.3.

Exceptions:

    1. Where there are more than 30 dwelling units on a single public or private fire apparatus access road and all dwelling units are equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3 of the International Fire Code, access from two directions shall not be required.

    2. The number of dwelling units on a single fire apparatus access road shall not be increased unless fire apparatus access roads will connect with future development, as determined by the fire code official.

9. Where two fire apparatus access roads are required, they shall be placed a distance apart equal to not less than one half of the length of the maximum overall diagonal dimension of the lot or area to be served, measured in a straight line between accesses.

10. Where the vertical distance between the grade plane and the highest roof surface exceeds 30 feet (9144 mm), approved aerial fire apparatus access roads shall be provided. For purposes of this section, the highest roof surface shall be determined by measurement to the eave of a pitched roof, the intersection of the roof to the exterior wall, or the top of parapet walls, whichever is greater.

*11.* New and existing buildings shall have approved address numbers, building numbers or approved building identification placed in a position that is plainly legible and visible from the street or road fronting the property. These numbers shall contrast with their background. Where required by the fire code official, address numbers shall be provided in additional approved locations to facilitate emergency response. Address numbers shall be Arabic numbers or alphabetical letters. Numbers shall be a minimum of 4 inches (101.6 mm) high with a minimum stroke width of 0.5 inch (12.7 mm). Where access is by means of a private road and the building

cannot be viewed from the public way a monument, pole or other sign or means shall be used to identify the structure. Address numbers shall be maintained.

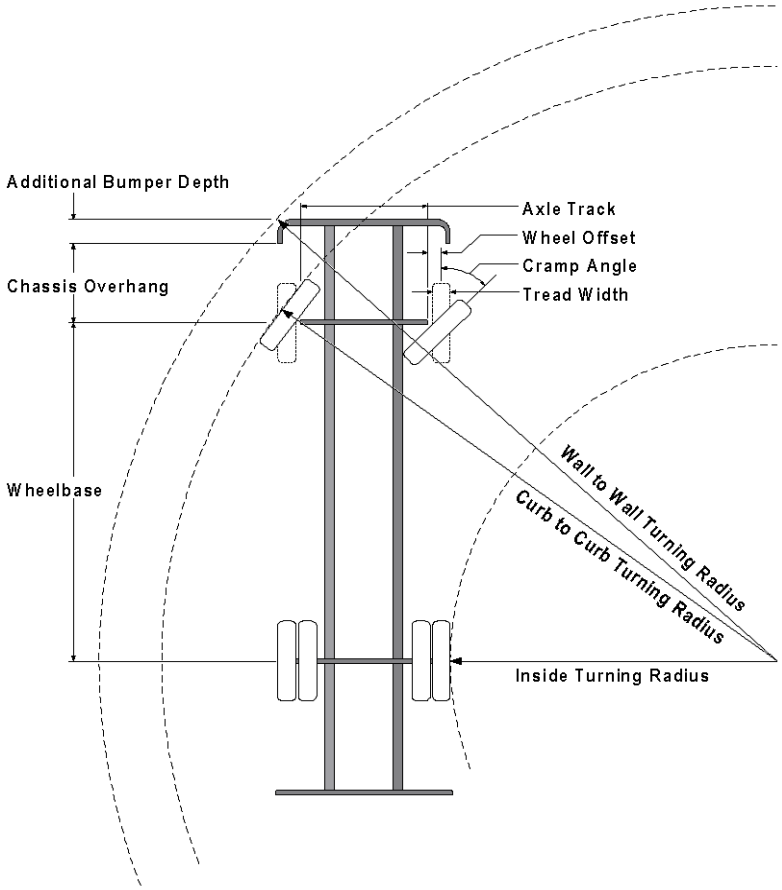
Please contact Fire Marshal, Taw Tamlin at 303-857-4603 or ttamlin@ftluptonfire.com if you have questions or need further assistance.

# Turning Performance Analysis

12/6/2012

**Bid Number:** 299
**Department:**

**Chassis:** Arrow-XT Chassis, PAP/SkyArm/Midmount MUX, 2010
**Body:** Aerial, Platform 100', Alum Body




**Parameters:**

| | |
|---|---|
| Inside Cramp Angle: | 45° |
| Axle Track: | 82.92 in. |
| Wheel Offset: | 5.25 in. |
| Tread Width: | 17.4 in. |
| Chassis Overhang: | 68.99 in. |
| Additional Bumper Depth: | 19 in. |
| Front Overhang: | 156.6 in. |
| Wheelbase: | 247 in. |

**Calculated Turning Radii:**

| | |
|---|---|
| Inside Turn: | 19 ft. 5 in. |
| Curb to curb: | 35 ft. 6 in. |
| Wall to wall: | 44 ft. 2 in. |

**Comments:**

| CategoryID | Category Description | OptionCode | OptionDescription |
|---|---|---|---|
| 6 | Axle, Front, Custom | 0018453 | Axle, Front, Oshkosh TAK-4, Non Drive, 22,800 lb, DLX/Enf/Qtm/AXT |
| 30 | Wheels, Front | 0001656 | Wheels, Front, 22.50" x 12.25", Steel, Hub Pilot |
| 31 | Tires, Front | 0594821 | Tires, Front, Goodyear, G296 MSA, 425/65R22.50, 20 ply |
| 38 | Bumpers | 0550016 | Bumper, 19" Extended, AXT, Dash CF |
| 437 | Aerial Devices | 0592931 | Aerial, 100' Pierce Platform, 50 MPH Wind Rating, 150lb Tip Load Allowance |

**Notes:**

Actual Inside Cramp Angle may be less due to highly specialized options.

Curb to Curb turning radius calculated for a 9.00 inch curb.

# Turning Performance Analysis

12/6/2012

**Bid Number:** 299
**Department:**

**Chassis:** Arrow-XT Chassis, PAP/SkyArm/Midmount MUX, 2010
**Body:** Aerial, Platform 100', Alum Body

**Definitions:**

| | |
|---|---|
| Inside Cramp Angle | Maximum turning angle of the front inside tire. |
| Axle Track | King-pin to King-pin distance of the front axle. |
| Wheel Offset | Offset from the center-line of the wheel to the king-pin. |
| Tread Width | Width of the tire tread. |
| Chassis Overhang | Distance of the center-line of the front axle to the front edge of the cab. This does not include the bumper depth. |
| Additional Bumper Depth | Depth that the bumper assembly adds to the front overhang. |
| Wheelbase | Distance between the center lines of the vehicle's front and rear axles. |
| Inside Turning Radius | Radius of the smallest circle around which the vehicle can turn. |
| Curb to Curb Turning Radius | Radius of the smallest circle inside of which the vehicle's tires can turn. This measurement assumes a curb height of 9 inches. |
| Wall to Wall Turning Radius | Radius of the smallest circle inside of which the entire vehicle can turn. This measurement takes into account any front overhang due to chassis,bumper extensions and/or aerial devices. |

Dead-end fire apparatus access roads in excess of 150 feet (45 720 mm) shall be provided with width and turnaround provisions in accordance with Table D103.4 fond in referral letter.

| LINE TABLE | | |
|---|---|---|
| LINE | BEARING | DISTANCE |
| L1 | S43°09'42"E | 9.51' |
| L2 | N62°50'48"E | 1.17' |
| L3 | S62°50'48"W | 8.14' |
| L4 | S62°52'38"W | 0.16' |
| L5 | N62°50'48"E | 1.29' |
| L6 | N27°09'12"W | 4.67' |
| L7 | N27°09'12"W | 4.67' |
| L9 | N45°59'10"W | 13.12' |

| CURVE TABLE | | | | |
|---|---|---|---|---|
| CURVE | DELTA | RADIUS | LENGTH | CHORD |
| C1 | 90°00'00" | 13.00' | 20.42' | S45°16'07"E 18.38' |
| C2 | 28°31'44" | 50.00' | 24.90' | N76°00'15"W 24.64' |
| C3 | 40°06'33" | 50.00' | 35.00' | N41°41'07"W 34.29' |
| C4 | 40°06'33" | 50.00' | 35.00' | N01°34'34"W 34.29' |
| C5 | 253°23'54" | 50.00' | 221.13' | N36°25'51"E 80.18' |
| C8 | 73°23'54" | 20.00' | 25.62' | N53°34'09"W 23.90' |
| C9 | 90°00'00" | 13.00' | 20.42' | S44°43'53"W 18.38' |
| C10 | 90°00'00" | 13.00' | 20.42' | N45°16'07"W 18.38' |
| C11 | 1°10'19" | 175.00' | 3.58' | N00°19'03"E 3.58' |
| C12 | 2°46'17" | 225.00' | 10.88' | N01°07'02"E 10.88' |
| C13 | 13°56'57" | 225.00' | 54.78' | N09°28'39"E 54.64' |
| C14 | 38°23'55" | 175.00' | 117.28' | N20°06'10"E 115.10' |
| C15 | 63°06'55" | 175.00' | 192.77' | N31°17'21"E 183.17' |
| C17 | 63°06'55" | 225.00' | 247.85' | N31°17'21"E 235.51' |
| C18 | 13°58'29" | 225.00' | 54.88' | N23°26'23"E 54.74' |
| C19 | 8°00'31" | 225.00' | 31.45' | N34°25'53"E 31.42' |
| C20 | 13°41'21" | 225.00' | 53.76' | N45°16'49"E 53.63' |
| C21 | 23°32'40" | 175.00' | 71.91' | N51°04'28"E 71.41' |
| C22 | 10°43'19" | 225.00' | 42.10' | N57°29'09"E 42.04' |
| C23 | 23°30'43" | 150.00' | 61.55' | S51°05'27"W 61.12' |

| CURVE TABLE | | | | |
|---|---|---|---|---|
| CURVE | DELTA | RADIUS | LENGTH | CHORD |
| C24 | 29°55'48" | 150.00' | 78.36' | S47°52'54"W 77.47' |
| C25 | 6°25'05" | 150.00' | 16.80' | S36°07'33"W 16.79' |
| C26 | 27°40'04" | 32.00' | 15.45' | S19°04'59"W 15.30' |
| C27 | 17°37'16" | 36.00' | 11.07' | N14°03'35"E 11.03' |
| C28 | 23°08'19" | 145.00' | 58.56' | S11°18'03"W 58.16' |
| C29 | 24°48'28" | 205.00' | 88.76' | S12°08'07"W 88.07' |
| C30 | 27°59'58" | 42.00' | 20.52' | S38°32'20"W 20.32' |
| C31 | 20°50'59" | 15.00' | 5.46' | N42°06'50"E 5.43' |
| C32 | 9°23'19" | 200.00' | 32.77' | S36°22'59"W 32.74' |
| C34 | 31°09'28" | 200.00' | 108.76' | S47°16'04"W 107.43' |
| C35 | 21°46'10" | 200.00' | 75.99' | S51°57'44"W 75.53' |
| C36 | 90°00'00" | 13.00' | 20.42' | N17°50'48"E 18.38' |
| C37 | 90°00'00" | 13.00' | 20.42' | S44°43'53"W 18.38' |
| C37 | 90°00'00" | 13.00' | 20.42' | S72°09'12"E 18.38' |
| C38 | 26°53'05" | 175.00' | 82.11' | S13°42'39"E 81.36' |
| C40 | 10°34'57" | 225.00' | 41.56' | S21°51'43"E 41.50' |
| C41 | 26°53'05" | 225.00' | 105.58' | S13°42'39"E 104.61' |
| C42 | 15°29'53" | 225.00' | 60.86' | S08°49'19"E 60.67' |
| C43 | 0°48'16" | 225.00' | 3.16' | S00°40'14"E 3.16' |

50 25 0 50 100
ORIGINAL SCALE: 1" = 50'


PREPARED FOR
LUPTON LAND, LLC
10221 PRESTWICK TRAIL
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Know what's below. Call before you dig.

UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, JR ENGINEERING APPROVES THEIR USE ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.


| No. | REVISION | BY | DATE |
|---|---|---|---|

H-SCALE 1"=50'
V-SCALE 1"=X'
DATE 12/13/21
DESIGNED BY ANI
DRAWN BY ANI
CHECKED BY

# COYOTE CREEK FILING NO. 4

## PUD FINAL PLAT

SHEET 4 OF 46
JOB NO. 16093.00

## Magaly Morales-Tejada

**From:** Jake Freier
**Sent:** Tuesday, January 4, 2022 10:21 AM
**To:** Magaly Morales-Tejada
**Cc:** Maria Lancto; Todd Hodges; Alyssa Knutson; Roy Vestal
**Subject:** RE: Referral Response Request - Coyote Creek Filing No. 4 Preliminary and Final Plat (LUP2021-0032)

Magaly and Planning Staff,

Per our discussion in our staff meeting pertaining to the street names in Coyote Creek No. 4:

Before recording, the developer needs to work with staff to solidify the naming of streets in the subdivision. As of this moment, there is no duplication of the development's proposed street names. However, the names Logan and Lupton are currently reserved as part of a proposed street naming strategy for the outlying arterial County Roads. We request that these street names be changed before recording of the plat.

Furthermore, we request that north-south oriented streets be called "Avenue" and east-west oriented streets be called "Street".

Thanks,
Jake Freier

**JAKE FREIER, GISP**
*GIS Specialist*
City of Fort Lupton

720-466-6115 (office)
303-720-5155 (cell)
jfreier@fortluptonco.gov

130 S. McKinley Ave.
Fort Lupton, CO 80621
www.fortluptonco.gov

---

**From:** Magaly Morales-Tejada <MMTejada@Fortluptonco.gov>
**Sent:** Monday, December 13, 2021 11:09 AM
**Cc:** Maria Lancto <MLancto@Fortluptonco.gov>; Todd Hodges <thodges@Fortluptonco.gov>; Alyssa Knutson <AKnutson@Fortluptonco.gov>
**Subject:** Referral Response Request - Coyote Creek Filing No. 4 Preliminary and Final Plat (LUP2021-0032)

Good Morning,

The documentation located at the following link is submitted to you for review and recommendation for a preliminary and final plat being reviewed by the City of Fort Lupton. The application documents can be reviewed at the following link: https://www.fortlupton.org/DocumentCenter/Index/643.

Any comments you consider relevant to this request would be appreciated. Please reply by **January 3, 2022**, so that we may give full consideration to your recommendation. Any response not received before or on this date may be deemed to be a favorable response to the Planning & Building Department.

The Public Hearings for this matter are scheduled for:

- Planning Commission: Thursday, January 13, 2022 at 6:00 PM; and
- City Council: Tuesday, February 1, 2022 at 7:00 PM

Your time in this matter is greatly appreciated!

**Magaly Morales-Tejada**
**Planning assistant**
130 S. McKinley Ave.
Fort Lupton, CO 80621
Direct: 720-466-6111

## Magaly Morales-Tejada

**From:** Tyler Tarpley
**Sent:** Tuesday, January 4, 2022 11:05 AM
**To:** Todd Hodges; Magaly Morales-Tejada
**Subject:** Coyote Creek Filing 4

Hi Todd and Megaly,

As we discussed on the phone, I have some concerns about the setbacks and the general issue of golf balls and houses. It appears the setbacks are too close and will result in issues similar to what we have seen in the past. We also have a rain shelter that is partially off our property, will that need to be removed? Finally, construction wise we need to plan that the construction process and planning will include Mike Mcnay and myself to ensure the flow of golfers as well as golf course equipment (irrigation equipment) is not disturbed.

Thanks!

Tyler Tarpley, PGA
*General Manager*
Coyote Creek Golf Course
Office: 720-466-6189
Pro Shop: 303-857-6152

## Magaly Morales-Tejada

**From:** John Fryar
**Sent:** Monday, December 13, 2021 12:02 PM
**To:** Magaly Morales-Tejada
**Subject:** RE: Referral Response Request - Coyote Creek Filing No. 4 Preliminary and Final Plat (LUP2021-0032)

I don't see any LE issues.

Chief John Fryar

---

**From:** Magaly Morales-Tejada <MMTejada@Fortluptonco.gov>
**Sent:** Monday, December 13, 2021 11:09 AM
**Cc:** Maria Lancto <MLancto@Fortluptonco.gov>; Todd Hodges <thodges@Fortluptonco.gov>; Alyssa Knutson <AKnutson@Fortluptonco.gov>
**Subject:** Referral Response Request - Coyote Creek Filing No. 4 Preliminary and Final Plat (LUP2021-0032)

Good Morning,

The documentation located at the following link is submitted to you for review and recommendation for a preliminary and final plat being reviewed by the City of Fort Lupton. The application documents can be reviewed at the following link: https://www.fortlupton.org/DocumentCenter/Index/643.

Any comments you consider relevant to this request would be appreciated. Please reply by **January 3, 2022**, so that we may give full consideration to your recommendation. Any response not received before or on this date may be deemed to be a favorable response to the Planning & Building Department.

The Public Hearings for this matter are scheduled for:

- Planning Commission: Thursday, January 13, 2022 at 6:00 PM; and
- City Council: Tuesday, February 1, 2022 at 7:00 PM

Your time in this matter is greatly appreciated!

**Magaly Morales-Tejada**
**Planning assistant**
130 S. McKinley Ave.
Fort Lupton, CO 80621
Direct: 720-466-6111

CITY OF
Fort Lupton
EST 1836

Public Works

130 S. McKinley Avenue
Fort Lupton, CO 80621
Phone: 303.857.6694
Fax: 303.857.0351
www.fortluptonco.gov

MEMO

To: Todd Hodges
Alyssa Knutson
CC: Andrew Hugill (JR Engineering)

From: Roy Vestal

Date: December 29, 2021

Subject: Coyote Creek Filing No. 4 Preliminary and Final Plat (LUP2021-0032)
Public Works Review

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Public Works has reviewed the submitted documents for the above referenced development project with the following comments for inclusion with the Final Plat submittal. Be advised, review of construction drawings is for general compliance with city standards. There may be additional concerns as this design develops.

1. **Plat**
   a. The existing utilities in 9th Street - Line labeled as IRR is the gravity potable water main. The existing water lines at 9th Street and College need to be sorted out. The nonpotable well line is not connecting to the indicated water line (see attached).

2. **Site Plan**
   a. The water line will require an easement dedication, 20' wide.
   b. Site Plan A-1 – Please move the gate from 14th Street entry to the property line. Need to leave adequate room for truck to park out of the street to open gate.

3. **Drainage**
   a. Final Drainage Study as submitted is acceptable.
   b. The low point at 4th Street on the golf course may include a culvert. We need to include a tie-in with your inlet just north of 4th Street.

4. **Transportation**
   a. The Traffic Study as submitted is acceptable.

5. **Landscape / Grading** - *Chapter 2 Design Standards*
   a. A SWMP and Stormwater Discharge permit must be acquired from CDPH&E. Please submit proof of prior to receiving construction permits. Please provide copy of permit from CDPH&E.

b. Grading offsite to the north shall be coordinated and approved with RE-8 School District.
c. Review proposed landscape plans at street locations and evaluate for sight triangle conflicts.

**6. Utilities**

a. **Utility Study**
   i. Pg 3 - delete any discussion of interconnect of nonpotable and potable water mains
   ii. Please include a network hydraulic modeling of the proposed development. We need to ensure the distribution system proposed will be adequate for future city growth.

**b. Water - Chapter 3**
   i. You may want to place the PRV on the south side of the development off of the connection to 4th Street. The pressures in the high pressure line throughout Coyote Creek require individual PRV's at each house. Regulating the pressure to the 9th Street line pressure should eliminate this requirement for each lot.
   ii. Sht 10 - Interconnect between nonpotable and potable water mains is not allowed. Please remove.
   iii. Section 3.21.00 Water service lines shall be located a minimum of 10 feet away from all sewer services and a minimum of 5 feet away from all fire protection service lines (measured horizontally). All service lines shall be constructed perpendicular to the front property line of the property they are going to serve and not less than 5 feet from the side of a front property line.
   iv. Please specify pipe materials on the drawings. DIP as labeled is OK, but you may find PVC C900 for water lines less expensive.
   v. Specify "Red Mueller Super Centurion" hydrants in final construction drawings.
   vi. Sht 17 - Caution on service locations, Meter pits shall not be located in the driveway concrete. Water service must maintain a 10-feet separation from IRR. The ones I checked look good, but don't let the contractor get sloppy. Be sure builder's site plans will accommodate the driveway without getting within 4-feet of driveway.

**c. Non Potable Irrigation**
   i. Where possible, the irrigation line should maintain a 10-feet separation from sanitary. Where there is not room, the irrigation line may be closer to the sanitary, but always the potable water main requires 10-feet separation.
   ii. Cross connection interconnect to the potable water main is not allowed.

iii. Designate material as "PURPLE PIPE". May be HDPE or PVC C900 same standards as potable water lines. Service lines to be purple tubing.
iv. The main feed must be from a master metered vault location.

**d. Storm Sewer - Chapter 5**

i. If there is any way to reconfigure Logan and Raffi to allow better separation between irrigation line and sanitary sewer would be appreciated. Consider south inlet connect to north inlet

**e. Roadway - Chapter 6**

i. Preliminary Soils Report indicates presence of swelling soils, collapsible soils and shallow groundwater. The recommendations from the 2002 report were not greatly successful in this area. The pavement Design report will be required prior to paving. Soil stabilization measures will be required and a composite section for the pavement required.

**f. Traffic Control - Chapter 8**

i. The Traffic Study as submitted is acceptable.
ii. Sht 22 - Add City standard street sign. - City street sign standard is New City street signs are 2-sided Engineer Grade Reflective Aluminum, Green with white trim. I am attaching the City Logo

I have been ordering from RoadTrafficSigns.com

7. Final Construction Drawings should include City Standard Details as needed.
   a. Add standard detail W7, W8, W9 and W30.

8. **Public Improvement Agreement** – A Subdivision Improvements Agreement will be required for the construction of roadways, water, sewer and nonpotable water systems. See attached template.

9. A Geotechnical report for final pavement design will be required prior to paving.

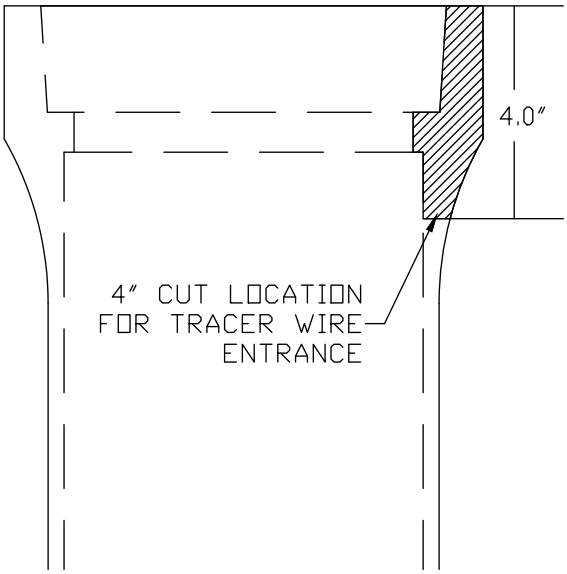
There may be additional concerns as this design develops.

# GENERAL NOTES

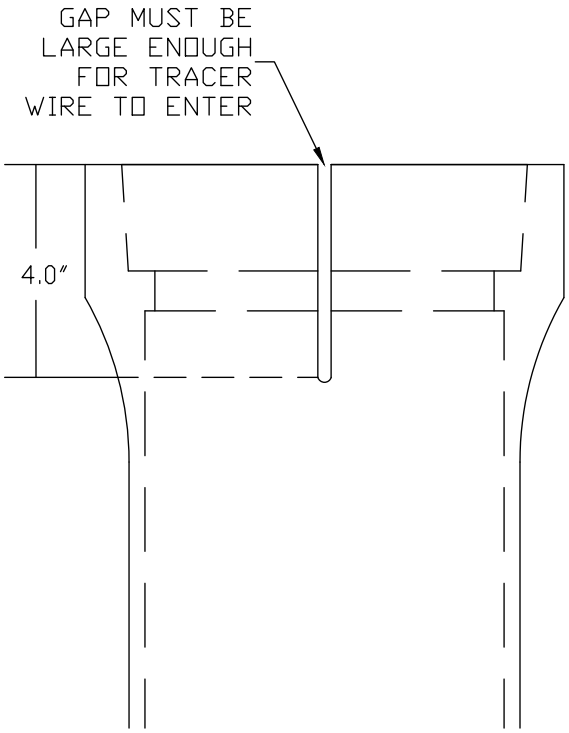
1. NOT FOR INSTALLATION IN ROADWAYS, DRIVEWAYS, PARKING AREAS, SIDEWALKS, OR CONCRETE. EDGE OF METER PIT LID SHALL NOT BE CLOSER THAN 4' FROM EDGE OF DRIVEWAY.
2. IF SURFACE IS NOT TO OFFICIAL GRADE WHEN THE METER IS INSTALLED, THE OWNER MUST RAISE OR LOWER THE PIT, METER SETTER AND ALL OTHER APPURTENANCES TO THE FINAL APPROVED GRADE.
3. METER SHALL BE SET WITHIN PUBLIC R.O.W OR PUBLIC EASEMENT.
4. NO CONCRETE FLOOR TO BE LAID IN METER PIT.
5. METER PIT SHALL BE CONSTRUCTED OF MODIFIED HI-DENSITY POLYETHELENE.
6. ADJUSTMENT RINGS SHALL BE 2", 3", 4" OR 6" IN HEIGHT AND SHALL BE INSERTED ABOVE THE POLYETHYLENE METER PIT.
7. FOR WATER SERVICE LINES 1" AND LARGER: IF THE METER PIT IS NOT INSTALLED WITHIN THE PUBLIC R.O.W. THEN A CURB STOP AND BOX SHALL BE INSTALLED WITHIN THE PUBLIC R.O.W.



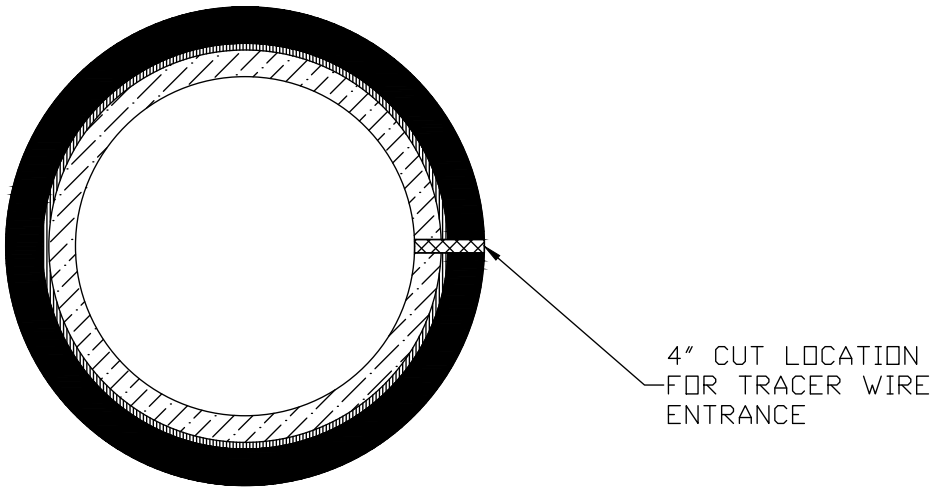
| CITY OF Fort Lupton EST 1836 COME PAINT YOUR FUTURE WITH US | DESIGN STANDARDS | STANDARD DRAWING |
|---|---|---|
| | 3/4" & 1" METER NOTES | W9 |
| | | DATE: 8/15/14 |




FRONT VIEW



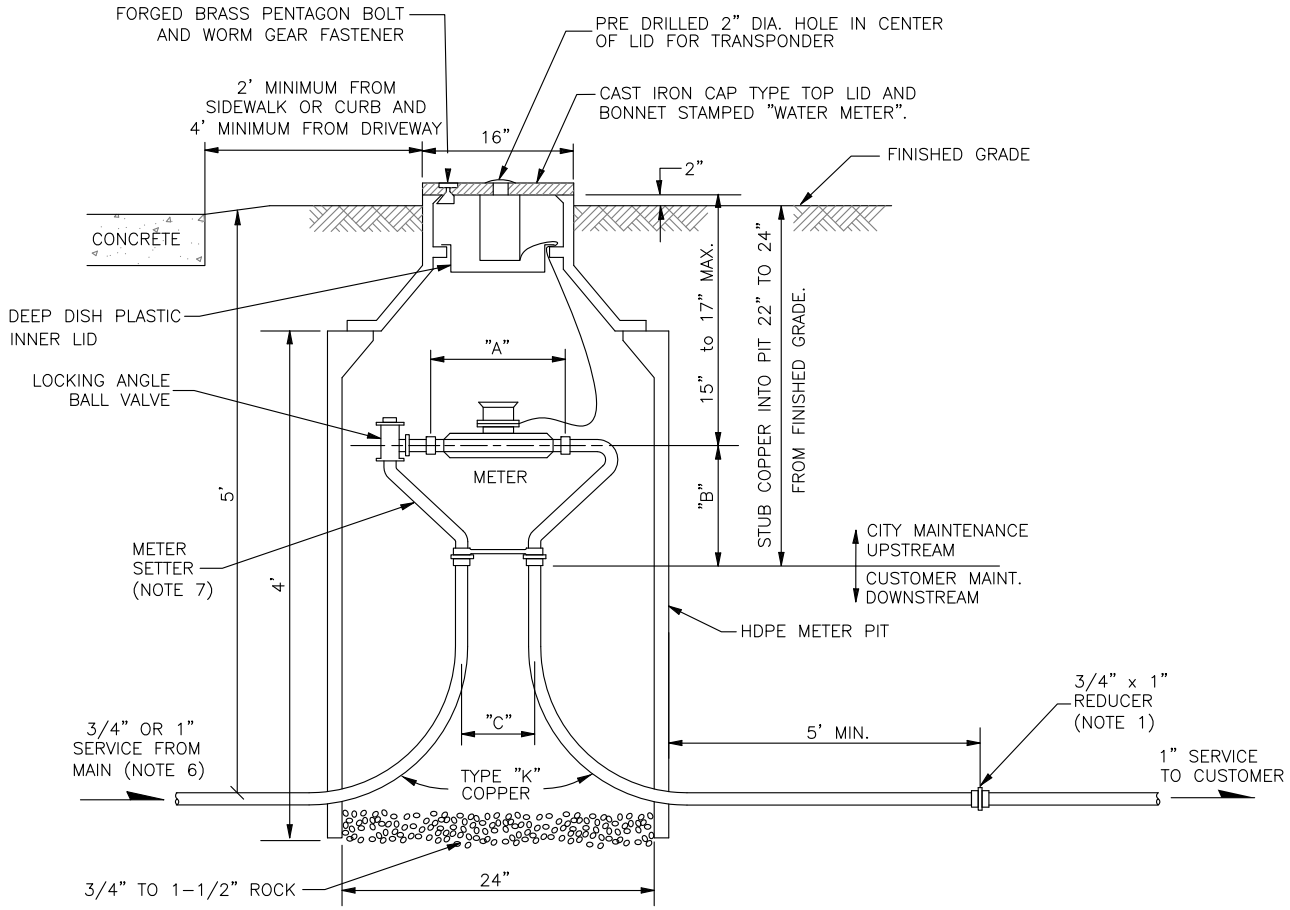

SIDE VIEW




TOP VIEW

CITY OF Fort Lupton EST 1836
COME PAINT YOUR FUTURE WITH US

| DESIGN STANDARDS | STANDARD DRAWING |
|---|---|
| TRACER WIRE FOR VALVES | W7a |
| | DATE: 11/28/17 |




| METER SIZE | A | B | C |
|---|---|---|---|
| 3/4" | 9" | 9" | 5" |
| 1" | 10-3/4" | 10" | 6" |

NOTES:

1. UPSIZING OF SERVICE PIPES AFTER THE METER REQUIRES THE APPROVAL OF THE BUILDING DEPARTMENT. FOR SERVICE PIPES UPSIZED FROM 3/4" TO 1", A REDUCER SHALL BE INSTALLED AS SHOWN ON THIS DETAIL.
2. ONLY COMPRESSION FITTINGS WILL BE ALLOWED ON COPPER SERVICE PIPES. FOR APPROVED MANUFACTURERS AND MODEL NUMBERS OF FITTINGS, REFER TO CHAPTER 3 OF THE CITY STANDARDS.
3. THIS DETAIL IS NOT INTENDED FOR INSTALLATION IN STREETS, DRIVEWAYS, OR CONCRETE AREAS.
4. METER PIT SHALL NE LOCATED IN A SOD OR MULCH AREA WITH A 10' MIN. WIDTH UTILITY EASEMENT. NO TREES, SHRUBS, OR STRUCTURES SHALL BE LOCATED IN THE EASEMENT.
5. SERVICE LINES TO THE METER PIT SHALL BE INSTALLED PERPENDICULAR TO THE WATER MAIN.
6. FOR 3/4" RESIDENTIAL METER INSTALLATIONS, NEWLY INSTALLED SERVICE LINES FROM MAIN SHALL BE 1". EXISTING 3/4" SERVICE LINES MUST BE REVIEWED AND APPROVED FOR CONFORMANCE WITH RESIDENTIAL FIRE SPRINKLER SYSTEM REQUIREMENTS.
7. PROPER METER SETTERS SHALL BE INSTALLED TO ACCOMMODATE SERVICE LINE SIZES FROM MAIN AND TO CUSTOMER. REFER TO SECTION 3.63.08 OF THE CITY WATER SYSTEM STANDARDS FOR ACCEPTABLE SETTER MODEL NUMBERS.

| | DESIGN STANDARDS | STANDARD DRAWING |
|---|---|---|
| CITY OF Fort Lupton EST 1836 COME PAINT YOUR FUTURE WITH US | 3/4" & 1" DOMESTIC METER SETS | W8 |
| | | DATE: 8/15/14 |

| | | |
|---|---|---|
| CITY OF Fort Lupton EST 1836 COME PAINT YOUR FUTURE WITH US | 3/4" & 1" IRRIGATION METER SETS | DATE: 10/30/20 |
| | DESIGN STANDARDS | W30 |
| | | STANDARD DRAWING |




NOTES:

1. IRRIGATION METER PIT SHALL BE LOCATED IN A LANDSCAPE AREA WITHIN THE RIGHT-OF-WAY. NO TREES, SHRUBS, OR STRUCTURES SHALL BE LOCATED WITHIN 5-FEET.
2. SERVICE LINES TO THE METER PIT SHALL BE INSTALLED PERPENDICULAR TO THE NON-POTABLE WATER MAIN.
3. IRRIGATION SERVICE LINE WILL NOT ENTER THE STRUCTURE. NO CONNECTION TO POTABLE PLUMBING FIXTURES IS ALLOWED

December 16, 2021

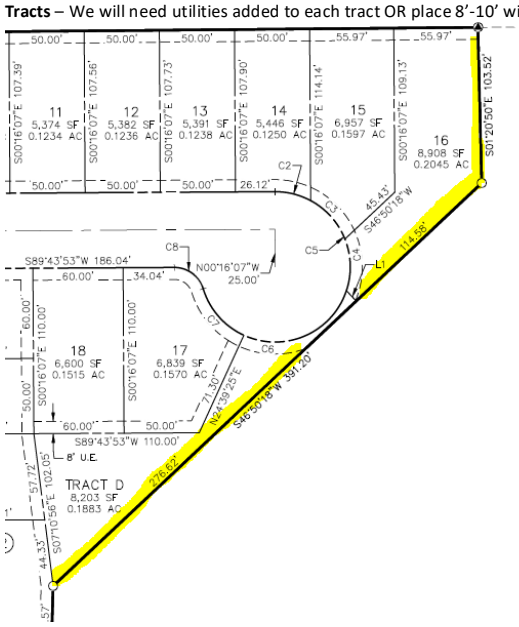
Fort Lupton Planning Department
130 S. McKinley Avenue
Fort Lupton, CO 80621
www.fortlupton.org

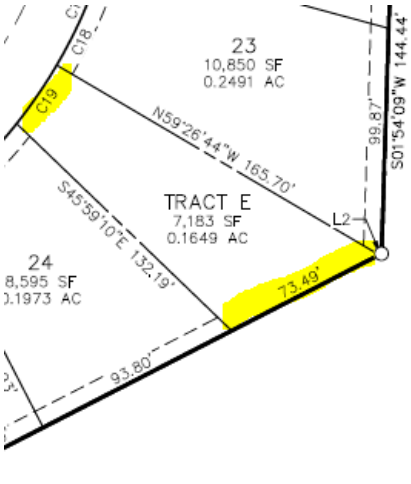
Re: Coyote Creek Filing No. 4 Preliminary and Final Plat (LUP2021-0032)

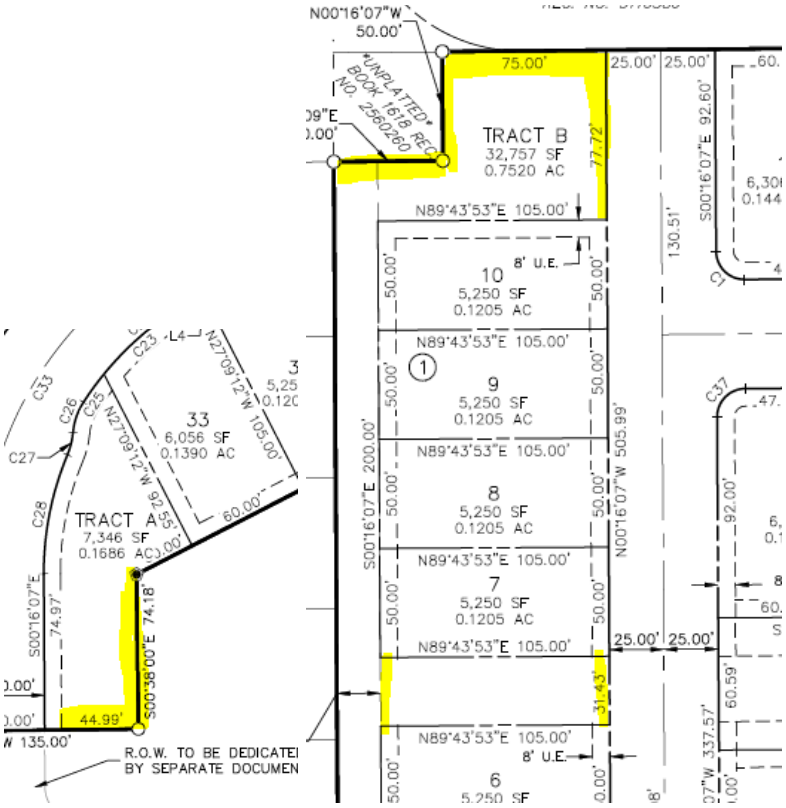
Dear Magaly Morales-Tejada:

On behalf of United Power, Inc., thank you for inviting us to review and comment on the Coyote Creek Filing No. 4 Preliminary and Final Plat (LUP2021-0032). After review of the information, we have the following comments:

- **Tracts** – We will need utilities added to each tract OR place 8'-10' wide dry utilities around the tracts – see pictures below.






- Easements utilized by United Power cannot be encumbered by any hard surfaces such as streets or sidewalks. Although the roadways/tracts on the plat are dedicated to utilities, we have above ground equipment that cannot be placed within these areas. In addition, sidewalks take away from the use of the easement & reduces the area, limiting where our equipment can be placed.

- **Tracts/Open Space/Parks** – United Power prefers dedicated blanket utility easement use within tracts as this gives us the opportunity to set above ground equipment, coordinated with the developer, and limit the impact to home lots. If Blanket utility easement(s) cannot be given, we will need a 10' to 12' wide dry utility easements along the perimeter of all tracts, along perimeter of tracts abutting roads, and through tracts between lots.

- **Streetlights** – When streetlight locations are identified in a subdivision, we need a 5' wide dry utility easement along one side of the lot closest to the streetlight location. All streetlight locations must be approved and signed off by the city/town, etc. Please note, if we do not get these through the platting process, we will have to get individual ones during the design which will slow United Power's ability to start construction significantly.

Please have the property owner/developer/contractor submit an application for new electric service, any modification to existing facilities including relocation and/or removal along with CAD data via https://www.unitedpower.com/construction. United Power would like to work with these persons early in the construction process on getting an electric design prepared so that we can request any additional easements needed and hopefully have those easements dedicated on the plat rather than obtaining separate instrument. Obtaining easements via a separate instrument can be time consuming and could cause delays.

***As a Reminder:*** No permanent structures are acceptable within the dry utility easement(s); such as, window wells, wing walls, retaining walls, basement walls, roof overhang, anything affixed to the house like decks, etc. United Power considers any structure that impedes the access, maintenance, and safety of our facilities a permanent structure. No exceptions will be allowed, and any encroachments could result in penalties.

Service will be provided according to the rules, regulations, and policies in effect by United Power at the time service is requested. We would like to remind the developer to call the Utility Notification Center by dialing 811 to have all utilities located prior to construction. We look forward to safely and efficiently providing reliable electric power and outstanding service.

Thank you,

Amber Mendoza
Amber Mendoza, RWA
ROW Agent
720.249.9315 | platreferral@unitedpower.com

**Right of Way & Permits**

1123 West 3rd Avenue
Denver, Colorado 80223
Telephone: **303.571.3306**
Facsimile: 303. 571. 3284
donna.l.george@xcelenergy.com

January 3, 2022

City of Fort Lupton Planning Department
130 South McKinley Avenue
Fort Lupton, CO 80621

Attn: Alyssa Knutson and Todd Hodges

**Re: Coyote Creek Filing No. 4, Case # LUP2021-0032**

Public Service Company of Colorado's (PSCo) Right of Way & Permits Referral Desk has reviewed the preliminary and final plat for **Coyote Creek Filing No. 4**.The property owner/developer/contractor must complete the application process for any new natural gas *service* via xcelenergy.com/InstallAndConnect. It is then the responsibility of the developer to contact the Designer assigned to the project for approval of design details.

If additional easements need to be acquired by separate PSCo document, a Right-of-Way Agent will need to be contacted.

PSCo also has existing electric *transmission* facilities and associated land rights abutting the west property line. Should there be any activities in this area, the property owner/developer/contractor must contact our Siting and Land Rights Department at either of the following:
website: www.xcelenergy.com/rightofway
email: coloradorightofway@xcelenergy.com

Donna George
Right of Way and Permits
Public Service Company of Colorado dba Xcel Energy
Office: 303-571-3306 – Email: donna.l.george@xcelenergy.com

# CITY OF FORT LUPTON
# CITY COUNCIL

Zo Stieber, Mayor

Valerie Blackston, Ward 1
Chris Ceretto, Ward 2
Carlos Barron, Ward 3

David Crespin, Ward 1
Claud Hanes, Ward 2
Bruce Fitzgerald, Ward 3

**AM 2022-024**

**APPROVING THE PURCHASE OF A MOWER FOR THE PARKS DEPARTMENT IN THE AMOUNT OF $20,976.45 ALLOCATED FROM THE GENERAL FUND PARKS BUDGET**

I. Agenda Date: Council Meeting – February 1, 2022

II. Attachments:
a. Warranty Statement
b. Quotes

III. Summary Statement:

The Parks department is requesting to purchase a 48 in. walker mower with a bagging system. The mower will provide a much better cut on the smaller parks and grounds areas.

IV. Submitted by: Brian Oswalt
Parks Supervisor

V. Finance Reviewed
Finance Director

VI. Approved for Presentation:
City Administrator

VII. Attorney Reviewed Approved Pending Approval

VIII. Certification of Council Approval:
City Clerk Date

IX. Detail of Issue/Request:

The zero turn mower that the Parks department is requesting to purchase will be a great addition to the fleet. It will come with a bagging system and will have a 48" cut. This mower is a smaller machine and will be able to maneuver very well in the smaller parks and city hall. With the ability to bag grass clippings and dump directly into the dump truck, it will also allow for a cleaner look and more efficient way of mowing. The city has put this mower out for bid and the following vendors have provided prices:

The Wrench Outdoor Power LLC- $ 22,808.12

MAC Equipment INC- $ 20,821.00

G&G Equipment- $ 20,976.45

X. Legal/Political Considerations:

N/A

XI. Alternatives/Options:

1. Purchase the new 48" Walker zero turn mower.
2. Do not purchase new mower and use equipment as is.

XII. Financial Considerations:

The General Fund Parks department budgeted $22,000 in 2022 for the purchase of a mower.

XIII. Staff Recommendation:

The Parks department recommends the purchase of the mower from G&G Equipment since we have purchased from them before. We also have a great relationship with them and they are very helpful with any maintenance or parts issues.

# LIMITED WARRANTY
# FOR
# WALKER
# COMMERCIAL RIDER MOWER
# MODELS MC, MT, MD

**1. WHAT THIS WARRANTY COVERS, AND FOR HOW LONG:**

Walker Manufacturing company will, at its option, repair or replace, without charge, any part covered by this warranty which is found to be defective in material and/or workmanship within two (2) years* after date of sale to the original retail purchaser unless the product is used for rental purposes, in which case this warranty is limited to ninety (90) days. At Walker's request, customer will make the defective part available for inspection by Walker and/or return the defective part to Walker, transportation charges prepaid. All parts and components of the Walker Mower are covered by this warranty **except** the following components which are warranted separately by their respective manufacturers:

Kohler Engine
Kubota Engine
Battery

The available warranties covering these items are furnished with each mower. Walker does not assume any warranty obligation, liability or modification for these items, which are covered exclusively by the stated warranty of the respective manufacturers noted above.

* Extended warranties are offered for the following powertrain components:
- A three (3) year unlimited hour warranty is offered for the Walker P/N 6200-9 Gear Axle Assembly.
- A three (3) year or 3000 hour (whichever comes first) warranty is offered for Eaton Model 7 Hydrostatic transmissions; covers full cost of replacement up to 1000 hours of use, and after 1000 hours warranty coverage is prorated against 3000 hours. If the transmissions are serviced at the recommended intervals by an authorized Walker Dealer using only Mobil SHC™ 630 oil (P/N 6450-20) and Walker filters (P/N 5024-13), the warranty will be extended to three (3) years, full replacement coverage, and unlimited hours.

**2. WHAT THIS WARRANTY DOES NOT COVER:**

A. This warranty does not cover defects caused by depreciation or damage caused by normal wear, accidents, improper maintenance, improper use or abuse of the product, alterations, or failure to follow the instructions contained in the Owner's Manual for operation and maintenance.

B. The customer shall pay any charges for making service calls and/or for transporting the mower to and from the place where the inspection and/or warranty work is performed.

**3. HOW TO OBTAIN SERVICE UNDER THIS WARRANTY:**

Warranty service can be arranged by contacting the dealer where you purchased the mower or by contacting Walker Manufacturing Company, 5925 East Harmony Road, Ft. Collins, CO 80528. Proof of the date of purchase may be required to verify warranty coverage.

**4. WARRANTY LIMITATION:**

A. **THERE IS NO OTHER EXPRESS WARRANTY. ANY WARRANTY THAT MAY BE IMPLIED FROM THIS PURCHASE INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE IS HEREBY LIMITED TO THE DURATION OF THIS WARRANTY AND TO THE EXTENT PERMITTED BY LAW ANY AND ALL IMPLIED WARRANTIES ARE EXCLUDED. Some states do not allow limitations on how long an implied warranty lasts, so the above limitations may not apply to you.**

B. **WALKER WILL NOT BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL, OR SPECIAL DAMAGES AND/OR EXPENSES IN CONNECTION WITH THE PURCHASE OR USE OF THE MOWER.** Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation(s) or exclusion(s) may not apply to you.

C. Only the warranty expressed in this limited warranty shall apply and no dealer, distributor, or individual is authorized to amend, modify, or extend this warranty in any way. Accordingly, additional statements such as dealer advertising or presentations, whether oral or written, do not constitute warranties by Walker, and should not be relied upon.

D. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

# LIMITED WARRANTY
# FOR
# WALKER
# COMMERCIAL RIDER MOWER
# MODELS MB, MS

**1. WHAT THIS WARRANTY COVERS, AND FOR HOW LONG:**

Walker Manufacturing company will, at its option, repair or replace, without charge, any part covered by this warranty which is found to be defective in material and/or workmanship within two (2) years* after date of sale to the original retail purchaser unless the product is used for rental purposes, in which case this warranty is limited to ninety (90) days. At Walker's request, customer will make the defective part available for inspection by Walker and/or return the defective part to Walker, transportation charges prepaid. All parts and components of the Walker Mower are covered by this warranty **except** the following components which are warranted separately by their respective manufacturers:

Kohler Engine
Briggs & Stratton Engine
Battery

The available warranties covering these items are furnished with each mower. Walker does not assume any warranty obligation, liability or modification for these items, which are covered exclusively by the stated warranty of the respective manufacturers noted above.

* Extended warranties are offered for the following powertrain components:
- A two (2) year or 2000 hour (whichever comes first) warranty is offered for Hydro-Gear ZT3100 Hydrostatic transaxle;- covers full cost of replacement up to 1000 hours of use, and after 1000 hours warranty coverage is prorated against 2000 hours.

**2. WHAT THIS WARRANTY DOES NOT COVER:**

A. This warranty does not cover defects caused by depreciation or damage caused by normal wear, accidents, improper maintenance, improper use or abuse of the product, alterations, or failure to follow the instructions contained in the Owner's Manual for operation and maintenance.

B. The customer shall pay any charges for making service calls and/or for transporting the mower to and from the place where the inspection and/or warranty work is performed.

**3. HOW TO OBTAIN SERVICE UNDER THIS WARRANTY:**

Warranty service can be arranged by contacting the dealer where you purchased the mower or by contacting Walker Manufacturing Company, 5925 East Harmony Road, Ft. Collins, CO 80528. Proof of the date of purchase may be required to verify warranty coverage.

**4. WARRANTY LIMITATION:**

A. **THERE IS NO OTHER EXPRESS WARRANTY. ANY WARRANTY THAT MAY BE IMPLIED FROM THIS PURCHASE INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE IS HEREBY LIMITED TO THE DURATION OF THIS WARRANTY AND TO THE EXTENT PERMITTED BY LAW ANY AND ALL IMPLIED WARRANTIES ARE EXCLUDED. Some states do not allow limitations on how long an implied warranty lasts, so the above limitations may not apply to you.**

B. **WALKER WILL NOT BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL, OR SPECIAL DAMAGES AND/OR EXPENSES IN CONNECTION WITH THE PURCHASE OR USE OF THE MOWER.** Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation(s) or exclusion(s) may not apply to you.

C. Only the warranty expressed in this limited warranty shall apply and no dealer, distributor, or individual is authorized to amend, modify, or extend this warranty in any way. Accordingly, additional statements such as dealer advertising or presentations, whether oral or written, do not constitute warranties by Walker, and should not be relied upon.

D. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

# LIMITED WARRANTY
# FOR
# WALKER
# COMMERCIAL RIDER MOWER
# MODELS MH

**1. WHAT THIS WARRANTY COVERS, AND FOR HOW LONG:**

Walker Manufacturing company will, at its option, repair or replace, without charge, any part covered by this warranty which is found to be defective in material and/or workmanship within two (2) years* after date of sale to the original retail purchaser unless the product is used for rental purposes, in which case this warranty is limited to ninety (90) days. At Walker's request, customer will make the defective part available for inspection by Walker and/or return the defective part to Walker, transportation charges prepaid. All parts and components of the Walker Mower are covered by this warranty **except** the following components which are warranted separately by their respective manufacturers:

Kohler Engine
Briggs & Stratton Engine
Battery

The available warranties covering these items are furnished with each mower. Walker does not assume any warranty obligation, liability or modification for these items, which are covered exclusively by the stated warranty of the respective manufacturers noted above.

* A three (3) year or 3000 hour (whichever comes first) warranty is offered for HydroGear ZT3400 hydrostatic transmissions; covers full cost of replacement up to 1000 hours of use, and after 1000 hours warranty coverage is prorated against 3000 hours.

**2. WHAT THIS WARRANTY DOES NOT COVER:**

A. This warranty does not cover defects caused by depreciation or damage caused by normal wear, accidents, improper maintenance, improper use or abuse of the product, alterations, or failure to follow the instructions contained in the Owner's Manual for operation and maintenance.

B. The customer shall pay any charges for making service calls and/or for transporting the mower to and from the place where the inspection and/or warranty work is performed.

**3. HOW TO OBTAIN SERVICE UNDER THIS WARRANTY:**

Warranty service can be arranged by contacting the dealer where you purchased the mower or by contacting Walker Manufacturing Company, 5925 East Harmony Road, Ft. Collins, CO 80528. Proof of the date of purchase may be required to verify warranty coverage.

**4. WARRANTY LIMITATION:**

A. **THERE IS NO OTHER EXPRESS WARRANTY. ANY WARRANTY THAT MAY BE IMPLIED FROM THIS PURCHASE INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE IS HEREBY LIMITED TO THE DURATION OF THIS WARRANTY AND TO THE EXTENT PERMITTED BY LAW ANY AND ALL IMPLIED WARRANTIES ARE EXCLUDED. Some states do not allow limitations on how long an implied warranty lasts, so the above limitations may not apply to you.**

B. **WALKER WILL NOT BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL, OR SPECIAL DAMAGES AND/OR EXPENSES IN CONNECTION WITH THE PURCHASE OR USE OF THE MOWER.** Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation(s) or exclusion(s) may not apply to you.

C. Only the warranty expressed in this limited warranty shall apply and no dealer, distributor, or individual is authorized to amend, modify, or extend this warranty in any way. Accordingly, additional statements such as dealer advertising or presentations, whether oral or written, do not constitute warranties by Walker, and should not be relied upon.

D. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

# LIMITED WARRANTY
# FOR
# WALKER MODEL MR
# RIDER MOWERS

**1. WHAT THIS WARRANTY COVERS, AND FOR HOW LONG:**

Walker Manufacturing company will, at its option, repair or replace, without charge, any part covered by this warranty which is found to be defective in material and/or workmanship within three (3) years or 300 hours whichever comes first after date of sale to the original retail purchaser. At Walker's request, customer will make the defective part available for inspection by Walker and/or return the defective part to Walker, transportation charges prepaid. All parts and components of the Walker Mower are covered by this warranty **except** the following components which are warranted separately by their respective manufacturers:

Kohler Engine
Battery

The available warranties covering these items are furnished with each mower. Walker does not assume any warranty obligation, liability or modification for these items, which are covered exclusively by the stated warranty of the respective manufacturers noted above.

**2. WHAT THIS WARRANTY DOES NOT COVER:**

A. This warranty does not cover defects caused by depreciation or damage caused by normal wear, accidents, improper maintenance, improper use or abuse of the product, alterations, or failure to follow the instructions contained in the Operator's Manual for operation and maintenance.

B. The customer shall pay any charges for making service calls and/or for transporting the mower to and from the place where the inspection and/or warranty work is performed.

**3. HOW TO OBTAIN SERVICE UNDER THIS WARRANTY:**

Warranty service can be arranged by contacting the dealer where you purchased the mower or by contacting Walker Manufacturing Company, 5925 East Harmony Road, Ft. Collins, CO 80528. Proof of the date of purchase may be required to verify warranty coverage.

**4. WARRANTY LIMITATION:**

A. **THERE IS NO OTHER EXPRESS WARRANTY. ANY WARRANTY THAT MAY BE IMPLIED FROM THIS PURCHASE INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE IS HEREBY LIMITED TO THE DURATION OF THIS WARRANTY AND TO THE EXTENT PERMITTED BY LAW ANY AND ALL IMPLIED WARRANTIES ARE EXCLUDED.** Some states do not allow limitations on how long an implied warranty lasts, so the above limitations may not apply to you.

B. **WALKER WILL NOT BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL, OR SPECIAL DAMAGES AND/OR EXPENSES IN CONNECTION WITH THE PURCHASE OR USE OF THE MOWER.** Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation(s) or exclusion(s) may not apply to you.

C. Only the warranty expressed in this limited warranty shall apply and no dealer, distributor, or individual is authorized to amend, modify, or extend this warranty in any way. Accordingly, additional statements such as dealer advertising or presentations, whether oral or written, do not constitute warranties by Walker, and should not be relied upon.

D. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

**The Wrench Outdoor Power LLC**
6005 W 10th St #B
Greeley, CO. 80634
Phone: 970-353-5454 Fax: 000- -

**INVOICE**
**2490**

# INVOICE

Printed Date: 01/19/2022 **Work Completed: 01/19/2022**

**City of Ft. Lupton - Doug Ettere**
205 South Harrison Avenue
Fort Lupton, CO 80621
Home 303-304-4507

2021 Walker T27i -
Lic # :
VIN # :

Odometer In : 0

| Part Description / *Number* | Qty | Sale | Ext |
|---|---|---|---|
| Walker T27i<br>*T27i* | 1.00 | 17,442.00 | 17,442.00 |
| Spread Axle<br>*12313* | 1.00 | 510.00 | 510.00 |
| Suspension Seat<br>*6547* | 1.00 | 493.00 | 493.00 |
| Low Pro Tire<br>*46841* | 1.00 | 136.00 | 136.00 |
| 48" Deck<br>*48* | 1.00 | 2,733.00 | 2,733.00 |

**Labor Description** **Ext**

| Taxes | |
|---|---|
| Colorado sales tax | 618.11 |
| City of Greeley | 876.01 |

Org. Estimate 22,808.12 Revisions 0.00 Current Estimate 22,808.12

| | |
|---|---|
| **Labor:** | **0.00** |
| **Parts:** | **21,314.00** |
| **SubTotal:** | **21,314.00** |
| **Tax:** | **1,494.12** |
| **Total:** | **22,808.12** |
| **Bal Due:** | **$22,808.12** |

**[ Payments - ]**

Vehicle Received: 1/19/2022

Customer Number : 1177

I hereby authorize the above repair work to be done along with the necessary material and hereby grant you and/or your employees permission to operate the car or truck herein described on street, highways or elsewhere for the purpose to testing and/or inspection. An express mechanic's lien is hereby acknowledged on above car or truck to secure the amount of repairs thereto. Warranty on parts and labor is one years or 12,000 miles whichever comes first. Warranty work has to be performed in our shop & cannot exceed the original cost of repair.

Signature _____ Date _____

Visit us on the web: www.thewremchoutdoorpower.com

Email Address: ***Clark@thewrenchgreeley.com***

Service Advisor : Blauvelt, Brad, Tech : Blauvelt, Brad



Copyright (c) 2022 Mitchell Repair Information Company, LLC invhrs 5.12.21kr

**MAC EQUIPMENT INC**
**LONGMONT**
715 S. Main Street
LONGMONT, Colorado 80501
**Main: 720-204-6335**

Status : **Open** Invoice # : **380786**
Type : **Major Unit Quote** Date : **01/19/2022**
Contact ID :**26102**
Tax Exempt # : **98-028120000**

**CITY OF FORT LUPTON**
**Anthony Gomez**
130 S MCKINLEY AVE
FORT LUPTON, Colorado 80621
UNITED STATES
AGOMEZ@FORTLUPTON.ORG
303-994-7613 - Mobile
720-466-6122 - Home

**Selected Units for Sale**

| N/U | Year | Make | Model | Unit Type | VIN/Serial | MSRP | Sale Price | DOC Fees | Off'l Fees | Prot. Pkg |
|---|---|---|---|---|---|---|---|---|---|---|
| | N/A | WALKER | (MTGHS27IH) MTGHS27IH \| KOHLER 27HP EFI \| HI DUMP \| 10 BUSHEL \| COMFORT SEAT | ZERO TURN | | $21,550.00 | $17,442.00 | $0.00 | $0.00 | $0.00 |
| | N/A | WALKER | (DC48-2) DC48-2 \| 48 IN COLLECTION DECK \| HD DRIVE | DECK | | $3,350.00 | $2,733.00 | $0.00 | $0.00 | $0.00 |

| Item Number | Description | Qty Req | Qty Del | Item Price | Total Discount | Ext. Price |
|---|---|---|---|---|---|---|
| LP8075 | UPGRADE LOW PROFILE TIRES (MODEL B/C/D/T EXCHANGE) | 1 | 0 | $185.00 | $49.00 | $136.00 |
| SA7420-3 | Spread Axle Tail Wheel Kit, Model D or T | 1 | 0 | $600.00 | $90.00 | $510.00 |

Total Parts Requested : 2 Total Parts Delivered : 0

Disclaimer
We appreciate the opportunity to give you a quote on your equipment today. Please let us know if you have any other questions.

THIS QUOTE IS VALID FOR ONE DAY, THE DATE ISSUED, ONLY AND MAY NOT REFLECT SHIPPING COSTS.

*All Special Order Pricing Is Subject To Change*

RETURNS
Our policy lasts 30 days. If 30 days have gone by since your purchase, unfortunately we cannot offer you a refund or exchange. To be eligible for a return, your item must be unused, in original packaging, and in the same condition that you received it. Any returnable items will be subject to a 25% restocking fee + shipping.
WE DO NOT ACCEPT ANY RETURNS ON THE FOLLOWING: CARBURETORS | CLIMBING OR SAFETY GEAR | ELECTRICAL | GASKETS | SPECIAL ORDERS | SERIALIZED UNITS

**Other Charges**

| | | |
|---|---|---|
| Item Total | + | $646.00 |
| Total Other Charges | = | $646.00 |

**Special Order(s)**

| | | | |
|---|---|---|---|
| | Item Total | + | $510.00 |
| *** | S/O Total | = | $510.00 |
| ** | S/O Deposit | = | $510.00 |

**Totals**

| | | | |
|---|---|---|---|
| | Sub Total | + | $20,311.00 |
| *** | Invoice Total | = | $20,311.00 |
| ** | S/O Deposit | + | $510.00 |
| | Amount Paid | - | $0.00 |
| *** | Transaction Total | = | $20,821.00 |

Balance Due = $20,821.00

**Deposit Paid $0.00**

| Tax Name | Tax Amount |
|---|---|
| Exempt | $0.00 |

**MAC EQUIPMENT INC**
**LONGMONT**
715 S. Main Street
LONGMONT, Colorado 80501
**Main: 720-204-6335**

Status : **Open**
Type : **Major Unit Quote**
Contact ID :**26102**
Tax Exempt # : **98-028120000**

Invoice # : **380786**
Date : **01/19/2022**

**CITY OF FORT LUPTON**
**Anthony Gomez**
130 S MCKINLEY AVE
FORT LUPTON, Colorado 80621
UNITED STATES
AGOMEZ@FORTLUPTON.ORG
303-994-7613 - Mobile
720-466-6122 - Home

Signature _____

# Q U O T A T I O N



G&G EQUIPMENT
3770 EUREKA WAY - UNIT A
FREDERICK, CO 80516
Phone #: (303)255-3227
Fax #: (303)833-8929

PHONE #: **(303)857-6694**
CELL #:
ALT. #:
P.O.#:
TERMS: **Net 15th EOM**
SALES TYPE: **Quote**

DATE: **1/4/2022**
ORDER #: **77779**
CUSTOMER #: **1483**
CP: **WILL**
LOCATION: **1**
STATUS: **Active**

**BILL TO** **1483**

CITY OF FT LUPTON
130 S MCCKINLEY AVE
FT LUPTON, CO 80621

**SHIP TO**

CITY OF FT LUPTON

| MFR | PRODUCT NUMBER | DESCRIPTION | QTY | PRICE | NET | TOTAL |
|---|---|---|---|---|---|---|
| WALK | MTGHS27IH | 27 EFI KOHLER, COMFORT SEAT, HIGH DUMP lp tires | 1 | $20,042.00 | $17,578.00 | $17,578.00 |
| WALK | DC48-2 | 48" GHS DECK HD | 1 | $3,116.00 | $2,733.00 | $2,733.00 |
| WALK | 7420-3 | Spread Axle Kit/Less Whls | 1 | $665.45 | $665.45 | $665.45 |

Prices reflected on this quote are valid for 30 days.

| | |
|---|---|
| **SUBTOTAL:** | **$20,976.45** |
| **TAX:** | **$0.00** |
| **ORDER TOTAL:** | **$20,976.45** |

Authorized By: _____

# CITY OF FORT LUPTON
# CITY COUNCIL

Zo Stieber, Mayor

Valerie Blackston, Ward 1
Chris Ceretto, Ward 2
Carlos Barron, Ward 3

David Crespin, Ward 1
Claud Hanes, Ward 2
Bruce Fitzgerald, Ward 3

**AM 2022-025**

**APPROVING THE PURCHASE OF MICROSOFT OFFICE 2021 LICENSES FOR AN AMOUNT NOT TO EXCEED $40,328.00 ALLOCATED FROM THE INFORMATION TECHNOLOGY BUDGET**

I. Agenda Date: Council Meeting – February 1, 2022

II. Attachments: a. Quote from Insight Public Sector

III. Summary Statement:

IT is requesting the purchase of 100 Microsoft Office 2021 licenses. The licenses can be used on 2021 office suite and earlier versions.

IV. Submitted by: _____
Travis Aksamitowski, IT Director

V. Finance Reviewed _____
Finance Director

VI. Approved for Presentation: _____
City Administrator

VII. Attorney Reviewed Approved Pending Approval

VIII. Certification of Council Approval: _____ _____
City Clerk Date

IX. Detail of Issue/Request:

IT Department is requesting the approval of purchasing One Hundred (100) Microsoft Office 2021 licenses to maintain compliance of the office suite usage. Although the City is currently using Office 2019, the 2021 office licenses are usable on 2019 Office as well. Once the Microsoft Office 2021 suite is tested, the licenses would be used when the Microsoft Office 2021 is deployed.

X. Legal/Political Considerations:

N/A

XI. Alternatives/Options:

Remove Microsoft Office from the environment which includes Word, Excel, Outlook (primary apps) within the Suite and move to another office suite (Open Source) such as Open Office or Libre Office

XII. Financial Considerations:

The IT department in the general fund budgets software licensing and upgrades every year. All the updates required by Microsoft in 2022 may, at year end, make this line item exceed its budget and a supplemental budget resolution may be necessary.

XIII. Staff Recommendation:

Staff recommends approval of the additional licenses and continue with the Microsoft Office suite.

INSIGHT PUBLIC SECTOR SLED
6820 S HARL AVE
TEMPE AZ 85283-4318
Tel: 800-467-4448

**SOLD-TO PARTY 10644566**

CITY OF FORT LUPTON
130 S MCKINLEY AVE
FORT LUPTON CO 80621-1343

**SHIP-TO**

CITY OF FORT LUPTON
130 S MCKINLEY AVE
FORT LUPTON CO 80621-1343

## Quotation

| | | |
|---|---|---|
| **Quotation Number** | : | 224586119 |
| **Document Date** | : | 20-JAN-2022 |
| **PO Number** | : | |
| **PO Release** | : | |
| **Sales Rep** | : | Peter Lonson |
| **Email** | : | PETER.LONSON@INSIGHT.COM |
| **Telephone** | : | |
| **Sales Rep 2** | : | Brian Stephenson |
| **Email** | : | BRIAN.STEPHENSON@INSIGHT.COM |
| **Telephone** | : | +18002692523 |

**We deliver according to the following terms:**

| | | |
|---|---|---|
| **Payment Terms** | : | Credit Card |
| **Ship Via** | : | Electronic Delivery |
| **Terms of Delivery:** | : | FOB DESTINATION |
| **Currency** | : | USD |

| Material | Material Description | Quantity | Unit Price | Extended Price |
|---|---|---|---|---|
| 79P-05855-SLP | Microsoft Office LTSC Professional Plus 2021 - license - 1 PC<br>SEL PLUS LICENSE-D APPS<br>STATE OF COLORADO NASPO VALUEPOINT SOFTWARE VAR(# ADSPO16-138244/ 20170000000000000105)<br>LICENSE : 6370469<br>DEPLOY DATE : 20-JAN-2022 | 100 | 403.28 | 40,328.00 |

| | |
|---|---|
| Product Subtotal | 40,328.00 |
| TAX | 0.00 |
| Total | 40,328.00 |

Thank you for considering Insight. Please contact us with any questions or for additional information about Insight's complete IT solution offering.

Sincerely,

Peter Lonson

PETER.LONSON@INSIGHT.COM

Brian Stephenson
+18002692523
BRIAN.STEPHENSON@INSIGHT.COM

Insight Global Finance has a wide variety of flexible financing options and technology refresh solutions. Contact your Insight representative for an innovative approach to maximizing your technology and developing a strategy to manage your financial options.

This purchase is subject to Insight's online Terms of Sale unless you have a separate purchase agreement signed by you and Insight, in which case, that separate agreement will govern. Insight's online Terms of Sale can be found at the "terms-and-policies" link below.

Effective Oct. 1, 2018, the U.S. government imposed tariffs on technology-related goods. Technology manufacturers are evaluating the impact on their cost and are providing us with frequent cost updates. For this reason, quote and ecommerce product pricing is subject to change as costs are updated. If you have any questions regarding the impact of the tariff on your pricing, please reach out to your sales team.

SOFTWARE AND CLOUD SERVICES PURCHASES: If your purchase contains any software or cloud computing offerings ("Software and Cloud Offerings"), each offering will be subject to the applicable supplier's end user license and use terms ("Supplier Terms") made available by the supplier or which can be found at the "terms-and-policies" link below. By ordering, paying for, receiving or using Software and Cloud Offerings, you agree to be bound by and accept the Supplier Terms unless you and the applicable supplier have a separate agreement which governs.
https://www.insight.com/terms-and-policies

# CITY OF FORT LUPTON
# CITY COUNCIL

Zo Stieber, Mayor

Valerie Blackston, Ward 1
Chris Ceretto, Ward 2
Carlos Barron, Ward 3

David Crespin, Ward 1
Claud Hanes, Ward 2
Bruce Fitzgerald, Ward 3

**AM 2022-026**

**APPROVAL OF A RESOLUTION FOR THE ACCEPTANCE OF SUBDIVISION IMPROVEMENTS AGREEMENT WITH LUPTON VILLAGE LAND DEVELOPERS, LLC, FOR THE LUPTON VILLAGE TOWNHOMES - FILING NO. 3**

I. Agenda Date: Council Meeting – February 1, 2022

II. Attachments:
a. Resolution 2022-0xx.
b. Subdivision Improvement Agreement

III. Summary Statement:

Approval of the Subdivision Improvements Agreement between the City of Fort Lupton and Lupton Village Land Developers, LLC, for the Lupton Village Townhomes, Filing No. 3 Final Plat.

IV. Submitted by: _____
Public Works Director

V. Finance Reviewed _____
Finance Director

VI. Approved for Presentation: _____
City Administrator

VII. Attorney Reviewed Approved Pending Approval

VIII. Certification of Council Approval: _____ _____
City Clerk Date

## IX. Detail of Issue/Request:

This Subdivision Improvement Agreement was drafted for the Lupton Village Townhomes - Filing No. 3 (LUP2021-0023 & Plan No. FPL2021-0003) approved by City Council on October 19, 2021, which is located north of CR 12, immediately west of S Rollie Avenue.

Improvements are for the construction of water, sanitary sewer main extensions, roadway construction on CR 12, landscape and storm drainage system improvements. Approximate cost of this agreement for construction is $671,660.00.

Resolution 2021R058, approved by Council on October 19, 2021 requires the applicant to enter into a Subdivision Improvements Agreement.

## X. Legal/Political Considerations:

Not Applicable

## XI. Alternatives/Options:

A) Approve Resolution
B) Do not approve Resolution

## XII. Financial Considerations:

None

## XIII. Staff Recommendation:

Staff recommends approval of this Subdivision Improvement Agreement between the City of Fort Lupton and Lupton Village Land Developers, LLC.

CITY OF
Fort Lupton
EST 1836

Public Works

130 S. McKinley Avenue
Fort Lupton, CO 80621
Phone: 303.857.6694
Fax: 303.857.0351
www.fortluptonco.gov

**SUBDIVISION IMPROVEMENTS AGREEMENT**
**FOR**
**LUPTON VILLAGE TOWNHOMES- Filing No. 3**

**THIS AGREEMENT** is made and entered into this 12th day of January 2022, by and between the CITY OF FORT LUPTON, a municipal corporation, in the County of Weld, State of Colorado, hereinafter referred to as the "City," and **Lupton Village Land Developers, LLC**, hereinafter referred to as "Developer", together referred to as the "Parties".

**WHEREAS**, the Developer submitted a Planned Unit Development Plat for the Subdivision entitled "Lupton Village PUD Third Filing, Project No. LUP2021-0023 and Plan No. FPL2021-0003" (the "Development "), which Plat depicts the proposed project (the "Development") to be constructed by Developer on the property depicted on the PUD, which is the "Subject Property"; and

**WHEREAS** the PUD was approved by the City of Fort Lupton City Council on October 19, 2021, by Resolution No. 2021R058 with conditions; and

**WHEREAS**, Developer is required to construct certain public improvements (the "Improvements") as a condition of subdivision approval for the Development; and

**WHEREAS**, Section 17-23(c) of the City of Fort Lupton Municipal Code requires that a subdivision agreement for public improvements be executed by the Developer and the City and recorded in the office of the Weld County Clerk and Recorder; and

**WHEREAS,** Section 17-23(f)(7) of the City of Fort Lupton Municipal Code requires that the installation of the required public improvements be guaranteed in the form of letter of credit, cash, or other suitable means, which have been approved by the City Attorney.

**NOW, THEREFORE**, in consideration of the foregoing, the Parties promise, covenant and agree as follows:

## 1.0 GENERAL CONDITIONS

**1.1 Development Obligation.** Developer shall be responsible for performance of the covenants set forth herein. Unless as otherwise amended within this agreement, the Developer shall be responsible for performance of all requirements in this Agreement.

**1.2 Engineering and Surveying Services.** Developer agrees to furnish, at its expense, all necessary engineering and surveying services relating to the design layout and construction of the improvements (the "Improvements") depicted on **Exhibit "A"** and **Exhibit "B"** attached hereto and fully incorporated herein by this reference. Said engineering services shall

be performed by or under the supervision of a Registered Professional Engineer or Registered Land Surveyor, or other professionals as appropriate, licensed by the State of Colorado, and in accordance with applicable Colorado law, and shall conform to the standards and criteria for public improvements as established and approved by the City as of the date of submittal to the City.

**1.3 Construction Standards.** Developer shall construct all Improvements required by this Agreement, in accordance with plans and specifications approved in writing by the City, in conformance with all applicable codes and ordinances as adopted by the City, and in full conformity with the City's construction and specifications applicable at the time of actual construction.

**1.4 Development Coordination.** Unless specifically provided in this Agreement to the contrary, all submittals to the City or approvals required of the City in connection with this Agreement shall be submitted to or rendered by the City Administrator, or his designee, who shall have general responsibility for coordinating development with Developer.

**1.5 Construction Acceptance and Warranty.** No later than ten (10) days after the Improvements are completed, Developer shall request and the City shall provide inspection by the City. If Developer does not request this inspection within ten (10) days of completion of the Improvements, the City may conduct the inspection without the approval of Developer. Developer shall provide "as-built" drawings no later than thirty (30) days after the Improvements are completed. If the Improvements completed by Developer are satisfactory, the City shall grant construction acceptance ("Construction Acceptance") within ten (10) days of the Developer's submission of "as-built" drawings, which shall be subject to final acceptance ("Final Acceptance") as set forth herein. If the Improvements completed by Developer are unsatisfactory, the City shall provide written notice to Developer of the repairs, replacements, construction or other work required to receive Construction Acceptance within ten (10) days from the date of City inspection. Developer shall complete all needed repairs, replacements, construction or other work within thirty (30) days of said notice, weather permitting. After Developer does complete the repairs, replacements, construction or other work required, Developer shall request a re-inspection of such work within ten (10) days to determine if Construction Acceptance can be granted. The City shall provide either Construction Acceptance or written notice of additional repairs, replacements, construction or other work required to receive Construction Acceptance within ten (10) days of the re-inspection date. The City shall issue no certificate of occupancy until the City has granted the Construction Acceptance.

**1.6 Final Acceptance.** At least thirty (30) days before one (1) year has elapsed from the issuance of Construction Acceptance, or as soon thereafter as weather permits, Developer shall request a Final Acceptance inspection. The City shall inspect the Improvements and shall notify the Developer in writing of all deficiencies and necessary repairs. After Developer has corrected all deficiencies and made all necessary repairs identified in said written notice, the City shall issue to Developer a letter of Final Acceptance.

**1.7 Testing and Inspection.**

(a) At all times during construction of the public improvements, the City shall have access to inspect materials and workmanship, and all materials and work not conforming to the approved plans and specifications shall be repaired or removed and replaced at Developer's expense so as to conform to the approved plans and specifications.

(b) The Developer will be responsible for oversight of the construction of the public improvements. The Developer shall solicit and retain a third-party engineer or inspector, solely at Developer's cost, to perform oversight, provided the engineer/inspector's qualifications are approved by the City prior to commencement of construction of the public improvements. The Developer will provide the resume of a Civil Engineer, or other qualified inspector(s), of the construction and installation of such improvements before construction may begin. The City Engineer or the City's designee shall determine the amount of oversight required, after consultation with the Developer.

(c) All testing required by the City's *"Standards and Specifications for the Design and Construction of Public Improvements"* shall be the responsibility of the Developer. All test reports shall be provided to the City Engineer.

(d) All work shown on the Improvements plans requires inspection by the City. Inspection services are provided Monday through Friday, except legal holidays, from 8:00 a.m. to 4:00 p.m. During the hours listed above and except as otherwise provided for in advance, inspections shall be scheduled a minimum of three (3) business days in advance.

**1.8 Indemnification and Release of Liability.** Developer agrees to defend, indemnify and hold harmless the City, its officers, employees, agents or servants, and to pay any and all judgments rendered against said persons on account of any suit, actions or claim caused by, arising from, or on account of acts or omissions by the Developer, its officers, employees, agents, consultants, contractors and subcontractors; provided, however, that Developer's obligation herein shall not apply to the extent said suit, action or claim results from any acts or omissions of officers, employees, agents or servants of the City. Said obligation of Developer shall be limited to suits, actions or claims based upon conduct prior to Final Acceptance by the City of the construction work. Developer acknowledges that the City's review and approval of plans for development of the Subject Property is done in furtherance of the general public's health, safety and welfare and that no immunity is waived and no specific relationship with, or duty of care to, the Developer or third parties is assumed by such review approval.

**1.9 Insurance OSHA.** Developer shall furnish to the City upon request proof thereof that all employees and contractors engaged in the construction of Improvements are covered by adequate Worker's Compensation Insurance and Public Liability Insurance and shall require faithful compliance with all provisions of the Federal Occupational Safety and Health Act (OSHA).

(a). **OSHA Requirements.** Developer agrees that it alone bears the responsibility for providing a safe and healthy work environment and shall provide its employees with adequate orientation and training to safely perform the scope of work set forth in this contract. Developer's Contractor shall at all times comply with the safety and health regulations of the Occupational Safety and Health Act of 1970 (29 CFR 1926) including all amendments and modifications thereto. In the event there is a conflict between the safety and health provisions of federal, state or local regulations, the more stringent provision shall prevail. Developer acknowledges and agrees that with respect to the scope of work under this contract, Developer's Contractor shall comply with all obligations and assume all responsibilities for its actions as required by all OSHA rules and regulations. The Contractor shall adhere to all federal, state and local safety and health regulations, laws and ordinances and shall comply with all obligations and assume all responsibilities imposed upon the "controlling contractor" as such term is defined and construed under all OSHA rules and regulations.

## 2.0 CONSTRUCTION OF IMPROVEMENTS

**2.1 Rights-of-Way, Easements and Permits.** Before the City may approve construction plans for any Improvements herein agreed upon, Developer shall acquire, at its own expense, all rights-of-way and easements depicted on the Plat, as required by the City for the construction of the Improvements. All such conveyances shall be free and clear of liens, taxes and encumbrances and shall be by deed, easement, license, agreement in form and substance acceptable to the City Administrator or the Administrator's designee. All title documents shall be recorded at the Developer's expense.

## 3.0 INFRASTRUCTURE IMPROVEMENTS

**3.1 Public Improvements**

The Developer agrees to construct public improvements (the "Improvements), within the Subdivision, depicted on **Exhibit "A"** attached hereto and fully incorporated herein by this reference. The Developer shall be responsible for providing the City with a Security Bond, Letter of Credit, or cash deposit with the City (the "Security") guaranteeing installation of the Improvements that are not completed prior to issuance of the first building permit. The amount shall be one hundred twenty-five percent (125%) of the applicable phased estimated cost of the required Improvements per approved Construction Drawings. The City may accept portions of the Improvements, reducing the Security for each portion completed and accepted by the City, to no less than twenty-five percent (25%) of the actual or estimated construction costs, whichever is greater, for each completed system. Each Improvement phase shall define a system, i.e. roadways system, sewer system, water system. The remaining twenty-five percent (25%) percent for each system shall be retained to secure the Developer's warranty during the designated warranty period. A warranty period of two (2) years shall apply to all public improvements. The City shall release or return the Security to the Developer within Thirty (30) days of receipt of the Conditional Acceptance as provided in paragraph 1.5 herein, less the twenty-five percent (25%) of construction costs to be retained during the warranty period. Upon Final Acceptance of the Improvements as provided in paragraph 1.6 herein, the twenty-five percent (25%) Security retained during the warranty period shall be released or returned to the Developer within Thirty (30) days of issuance of the Final Acceptance.

## 4.0 SPECIFICATIONS.

All street improvements, curb, gutter and sidewalks and appurtenances thereto, water mains, sewer mains and stormwater improvements shall be constructed and installed so as to meet or exceed City-approved plans, specifications and the Improvements described on **Exhibit "A"** Public Improvements. All streets within the Subdivision are considered Private and will not be maintained by the City. All improvements to County Road 12, as shown on page C13.1 of the approved Construction Documents, are considered public and will be maintained by the City. All streetscaping will meet the requirements of the Fort Lupton Subdivision Regulations. Detention or Retention pond improvements will be required at the time of construction on the site as determined by the Phase III Drainage Study submitted.

## 5.0 OTHER REQUIREMENTS

**5.1 Trash, Debris, Mud.** Developer agrees that, during construction of the Development and Improvements described herein, Developer shall take any and all steps necessary to control trash, debris and wind or water erosion in the Development. Developer agrees to take any and all steps necessary to prevent the transfer of mud or debris from the construction site into public rights-of-way and to immediately remove such mud and debris from

public rights-of-way after notification by the City. If these requirements are not met, the developer will be responsible for reimbursing the City for any costs incurred by the City in mitigating impacts of trash, debris, and mud.

**5.2 Erosion Control and Sedimentation Plan.** Developer agrees to submit an erosion control and sedimentation plan for review and approval by the City Engineer prior to commencement of construction on the site. Each individual lot will require erosion control measures be taken. Colorado State permits required shall be the responsibility of the Developer.

## 6.0 MISCELLANEOUS TERMS

**6.1 Local Codes and Ordinances.** In addition to any of the items listed in this Agreement, all construction in the Development is subject to all local Codes and Ordinances as adopted by the City subject to exceptions agreed or granted.

**6.2 Recording of Agreement.** The City shall record this Agreement at Developer's expense in the office of the Clerk and Recorder, County of Weld, State of Colorado, and the City shall retain the recorded Agreement.

**6.3 Binding Effect of Agreement.** This Agreement shall run with the land included within the Development and shall inure to the benefit of and be binding upon the successors and assigns of the parties hereto.

**6.4 Modification and Waiver.** No modification of the terms of this Agreement shall be valid unless in writing and executed with the same formality as this Agreement, and no waiver of the breach of the provisions of any section of this Agreement shall be construed as a waiver of any subsequent breach of the same section or any other sections which are contained herein.

**6.5 Notices.** Any notice or communication required or permitted hereunder shall be given in writing and shall be personally delivered or sent by United States mail, postage prepaid, registered or certified mail, return receipt requested, addressed as follows:

CITY: City of Fort Lupton
Attention: City Administrator
130 South McKinley Avenue
Fort Lupton, Colorado 80621

DEVELOPER: Lupton Village Land Developers, LLC
3780 W. 10th St, Unit 200
Greeley, CO 80634

or to such other address or the attention of such other person(s) as hereafter designated in writing by the applicable parties in conformance with this procedure. Notices shall be effective upon mailing or personal delivery in compliance with this paragraph.

**6.6 No Waiver Of Governmental Immunity.** The City, its elected officials, officers and employees are relying upon, and do not waive or intend to waive by any provision of this Agreement, the monetary limitations or any other rights, immunities and protections provided by the Colorado Governmental Immunity Act, C.R.S. Sec. 24-10-101 et seq. as amended or otherwise available to the City. Nothing herein shall operate as a waiver of any right the City has of governmental immunity under Colorado law which is specifically herein reserved.

**6.7 Force Majeure.** Neither party shall be liable or responsible to the other party nor be deemed to have defaulted under or breached this Agreement for failure or delay in fulfilling or performing any obligation under this Agreement when such failure or delay is caused by or results from causes beyond the reasonable control of the affected party, including but not limited to fire, floods, embargoes, pandemics, wars, acts of war (whether war is declared or not), insurrections, riots, civil commotions, strikes, lockouts or other labor disturbances, instances affecting public health including pandemics, acts of God or acts, omission, or delays in acting by any governmental authority. Provided, however, that the party so affected shall use reasonable efforts to avoid or remove such causes of non-performance, and shall continue performance hereunder with reasonable dispatch whenever such causes are removed. Either party shall provide the other party with prompt written notice of any delay or failure to perform that occurs by reason of force majeure. The parties shall mutually seek a resolution of the delay or the failure to perform as noted above.

**6.8 Approvals.** Whenever approval or acceptance of a matter is required or requested of the City pursuant to any provisions of this Agreement, the City shall act reasonably in responding to such matter, and no such approval or acceptance shall be unreasonably withheld or delayed.

**6.9 Title and Authority.** Developer warrants to the City that it is the record owner of the Subject Property upon which the Development shall be constructed or is acting in accordance with the authority of the owner. The undersigned further warrants to have full power and authority to enter into this Agreement.

**6.10 Severability.** This Agreement is to be governed and construed according to the laws of the State of Colorado. In the event that any provision of this Agreement is held to be violative of city, state or federal laws and hereby rendered unenforceable, either party, in its sole discretion, may determine whether the remaining provisions will or will not remain in force.

**IN WITNESS WHEREOF,** the Parties hereto have caused their duly authorized officials to place their hands and seals upon this Agreement the day and year first above written.

**CITY OF FORT LUPTON,** a Colorado municipal corporation

By: _____
Zo Stieber
Mayor

STATE OF COLORADO )
) ss.
COUNTY OF WELD )

SUBSCRIBED AND SWORN to before me this _____ day of _____ 2022, by Zo Stieber as Mayor of the City of Fort Lupton, Colorado.

WITNESS my hand and official seal.

MY COMMISSION EXPIRES: _____

_____
Notary Public

**Lupton Village Land Developers, LLC** a Colorado Limited Liability Company

By: _____
By: AJG NP Development, Manager
By: Andrew J. Gerk, Member

STATE OF COLORADO )
) ss.
COUNTY OF WELD )

SUBSCRIBED AND SWORN to before me this 12th day of January 2022, by Andrew J. Gerk, as Member of AJG NP Development, LLC as Manager of Lupton Village Land Developers, LLC, a Colorado Limited Liability Company.

WITNESS my hand and official seal.

MY COMMISSION EXPIRES: July 1, 2023

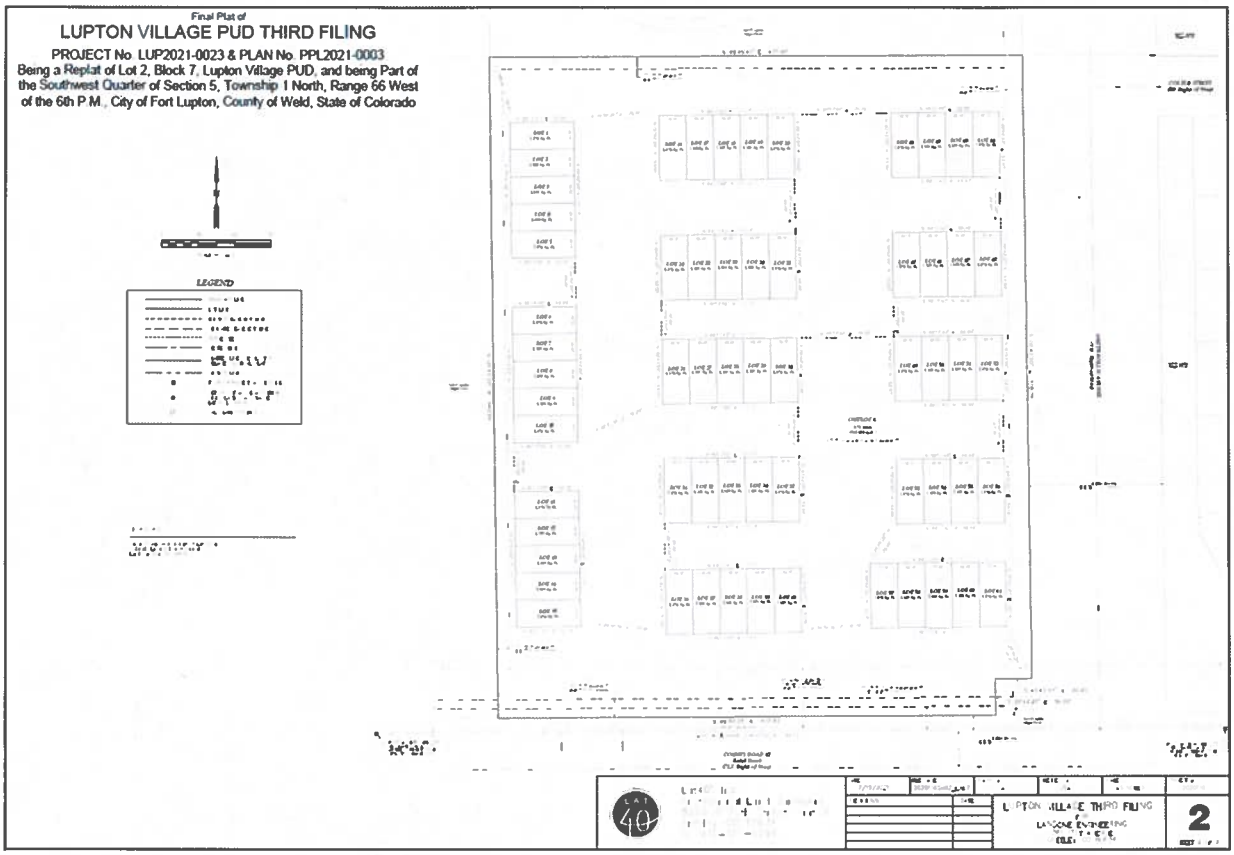
Rhonda Chaney
Notary Public

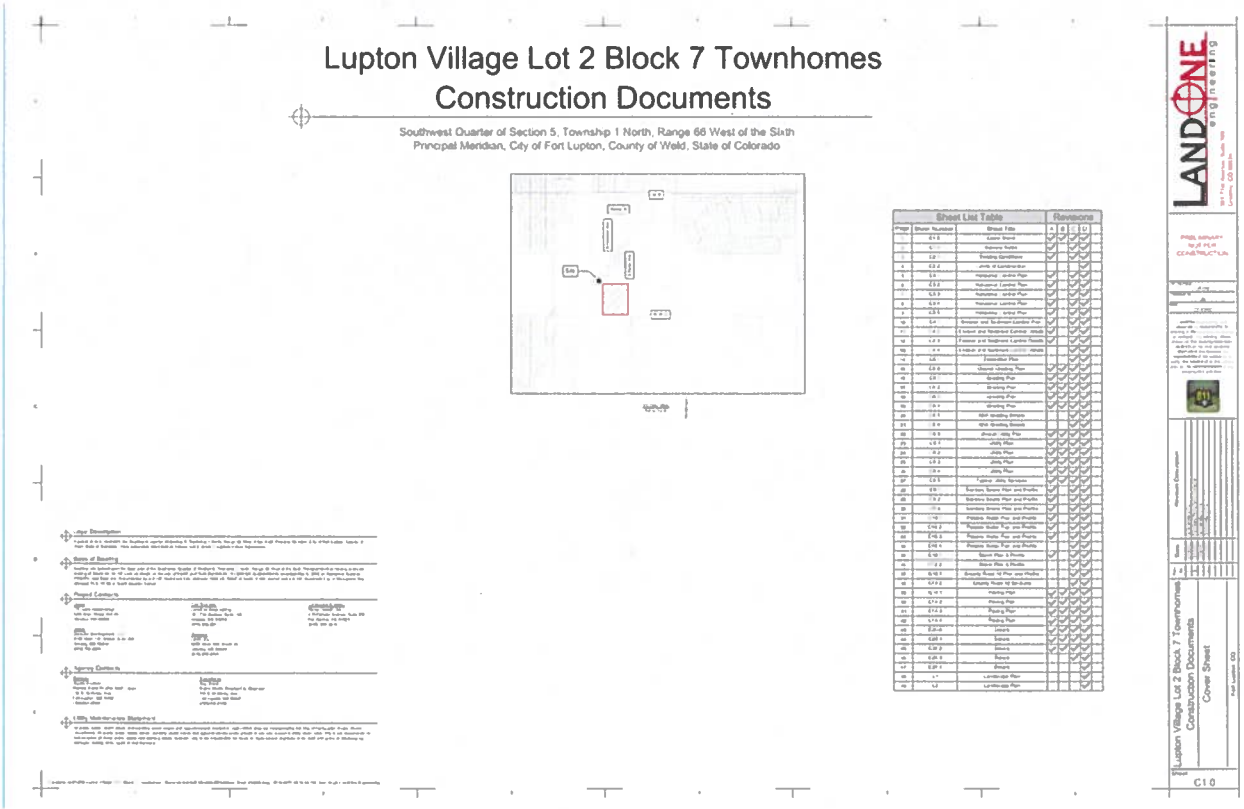
RHONDA CHANEY
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID 19964017330
MY COMMISSION EXPIRES JULY 1, 2023

# EXHIBIT A - Cost Estimate of Public Improvements

| | | | | |
|---|---|---|---|---|
| 4) SEWER | | | | |
| C | EACH | 1.00 | $3,499.20 | 3,499.20 |
| 8" DR35 Sewer Main | LF | 1,750.0 | $46.57 | $81,497.50 |
| 4.0' ID Sewer Manholes | EACH | 8.0 | $3,828.90 | $30,631.20 |
| 4" Sewer Stub From Main | EACH | 61.0 | $1,066.51 | $65,057.11 |
| 4" Sewer Clean Out | EACH | 61.0 | | $0.00 |
| Sewer Subtotal | | | | $180,685.01 |
| 5) WATER | | | | |
| 8" Water Tie In to existing stubs | EACH | 2.0 | $2,663.78 | $5,327.56 |
| 8" Water Main | LF | 1,540.0 | $45.80 | $70,532.00 |
| 8" Gate Valves | EACH | 9.0 | $2,244.19 | $20,197.71 |
| 8" Bends | EACH | 6.0 | $490.91 | $2,945.46 |
| Fir Hydrant | EACH | 3.0 | $6870.88 | $20,612.64 |
| 1 1/2" Taps to Service Meter | EACH | 15.0 | $2154.02 | $32,310.30 |
| 3/4" Meter Pit with Yoke | EACH | 64.0 | $2234.25 | $142,992.00 |
| 8X8 Tee | EACH | 3.0 | $5,321.20 | $15,963.60 |
| Water Subtotal | | | | $310,881.27 |
| 6) STORM | | | | |
| Storm Line 1 | | | | |
| 18" RCP | LF | 415.0 | $ 66.33 | $27,526.95 |
| 4' ID Storm Manhole | EACH | 3.0 | $ 3,419.81 | $10,259.43 |
| 5' Type R Inlet | EACH | 2.00 | $ 8,839.72 | $17,679.44 |
| Storm Subtotal | | | | $55,465.82 |
| 7) CONCRETE | | | | |
| Prep | | | | |
| 30" Vertical Curb and Gutter | LF | 395.0 | $3.36 | $1,327.20 |
| 10" SIDE WALK | EACH | 2.0 | $290.00 | $580.00 |
| Crosspan | SF | 390.0 | $1.04 | $405.60 |
| Fillets | EACH | 2.0 | $402.50 | $805.00 |
| Handicap Ramps | EACH | 2.0 | $290.00 | $580.00 |
| Prep Subtotal | | | | $3,697.80 |
| Concrete Placement | | | | |
| 30" Vertical Curb and Gutter | LF | 395.0 | $27.26 | $10,767.70 |
| 10' Concrete Walk - By retention Pond, 6" thick | EACH | 395.0 | $67.28 | $26,575.60 |
| Crosspan | SF | 390.0 | $9.28 | $3,619.20 |
| 25' Radius/Fillets | EACH | 2.0 | $1,856.00 | $3,712.00 |
| Single Handicap Ramp w/ Truncated Domes | SF | 2.0 | $1,740.00 | $3,480.00 |
| Concrete Placement Subtotal | | | | $48,154.50 |
| Concrete Subtotal | | | | $51,852.30 |
| 8) ASPHALT | | | | |
| Prep | | | | |
| Subgrade Prep Streets | SY | 828.0 | $3.10 | $2,566.80 |
| Subtotal | | | | $2,566.80 |
| Asphalt Placement | | | | |
| Asphalt Mob | EACH | 1.0 | $1,740.00 | $1,740.00 |
| Aggregate Base 8" | SY | 830.0 | $19.49 | $16,176.70 |
| Asphalt Paving 6" | SY | 830.0 | $41.76 | $34,660.80 |
| Raise Manholes | EACH | 16.0 | $696.00 | $11,136.00 |
| Raise Valve Boxes | EACH | 14.0 | $464.00 | $6,496.00 |
| Subtotal | | | | $70,209.50 |
| Asphalt Subtotal | | | | $72,776.30 |
| Construction Total | $671,660.70 | | | |

## EXHIBIT B


Final Plat of
LUPTON VILLAGE PUD THIRD FILING
PROJECT No. LUP2021-0023 & PLAN No. PPL2021-0003
Being a Replat of Lot 2, Block 7, Lupton Village PUD, and being Part of the Southwest Quarter of Section 5, Township 1 North, Range 66 West of the 6th P.M., City of Fort Lupton, County of Weld, State of Colorado
LEGEND
2


Lupton Village Lot 2 Block 7 Townhomes
Construction Documents
Southwest Quarter of Section 5, Township 1 North, Range 66 West of the Sixth Principal Meridian, City of Fort Lupton, County of Weld, State of Colorado
LAND ONE engineering
Lupton Village Lot 2 Block 7 Townhomes
Construction Documents
Cover Sheet
C1.0

# CITY OF FORT LUPTON
# CITY COUNCIL

Zo Stieber, Mayor

Valerie Blackston, Ward 1
Chris Ceretto, Ward 2
Carlos Barron, Ward 3

David Crespin, Ward 1
Claud Hanes, Ward 2
Bruce Fitzgerald, Ward 3

**AM 2022-027**

**APPROVAL OF A RESOLUTION FOR THE ACCEPTANCE OF SUBDIVISION IMPROVEMENTS AGREEMENT WITH CORONADO WEST, LLC, FOR THE MURATA FARMS - FILING NO. 1**

I. Agenda Date: Council Meeting – February 1, 2022

II. Attachments:
a. Resolution 2022-0xx.
b. Subdivision Improvement Agreement

III. Summary Statement:

Approval of the Subdivision Improvements Agreement between the City of Fort Lupton and Coronado West, LLC, for the Murata Farms, Filing No. 1 Final Plat.

IV. Submitted by: _____
Public Works Director

V. Finance Reviewed _____
Finance Director

VI. Approved for Presentation: _____
City Administrator

VII. Attorney Reviewed _____ Approved _____ Pending Approval

VIII. Certification of Council Approval: _____ _____
City Clerk Date

## IX. Detail of Issue/Request:

This Subdivision Improvement Agreement was drafted for the Murata Farms - Filing No. 1 (LUP2021-0028) approved by City Council on February 1, 2022, which is located south of Highway 52, immediately west of S College Avenue.

Improvements are for the construction of water, nonpotable water and sanitary sewer main extensions, roadway construction, landscape and storm drainage system improvements. Approximate cost of this agreement for construction is $7,792,531.00.

This agreement includes payments for the reimbursement agreement with Mountain Sky for extension of the water mains and S College Avenue roadway improvements.

Resolution 2022Rxxx, approved by Council on February 1, 2022 requires the applicant to enter into a Subdivision Improvements Agreement.

## X. Legal/Political Considerations:

Not Applicable

## XI. Alternatives/Options:

A) Approve Resolution
B) Do not approve Resolution

## XII. Financial Considerations:

None

## XIII. Staff Recommendation:

Staff recommends approval of this Subdivision Improvement Agreement between the City of Fort Lupton and Coronado West, LLC.

CITY OF
Fort Lupton
EST 1836

Public Works

130 S. McKinley Avenue
Fort Lupton, CO 80621
Phone: 303-857-6694
Fax: 303.857.0351
www.fortluptonco.gov

**SUBDIVISION IMPROVEMENTS AGREEMENT**
**FOR**
**MURATA FARMS**
**(Residential)**

**THIS AGREEMENT** is made and entered into this _____ day of _____, 2022, by and between the **CITY OF FORT LUPTON**, a municipal corporation, in the County of Weld, State of Colorado, hereinafter referred to as the "City," and **CORONADO WEST, LLC**, a Delaware limited liability company hereinafter referred to as "Developer", together referred to as the "Parties".

**WHEREAS**, the Developer submitted a Final Plat entitled "Murata Farms Filing No. 1, Project No. LUP2021-0028" (the "Plat"), which depicts the proposed project (the "Development") to be constructed by Developer on the property depicted on the Plat, which is the "Subject Property"; and

**WHEREAS** the Final PUD Plat was approved by the City of Fort Lupton City Council on _February 1, 2022, by Resolution No. 2022R0__ with a condition of approval requiring a Subdivision Improvements Agreement; and

**WHEREAS** the Developer is required to submit Construction Drawings for the Development to be approved by the City Engineer; and

**WHEREAS**, Developer is required to construct certain public improvements (the "Improvements") as a condition of Final Plat and subdivision approval for the Development; and

**WHEREAS**, Section 17-23(c) of the City of Fort Lupton Municipal Code requires that a subdivision agreement for public improvements be executed by the Developer and the City and recorded in the office of the Weld County Clerk and Recorder; and

**WHEREAS,** Section 17-23(f)(7) of the City of Fort Lupton Municipal Code requires that the installation of the required public improvements be guaranteed in the form of letter of credit, cash, or other suitable means, which have been approved by the City Attorney.

**NOW, THEREFORE**, in consideration of the foregoing, the Parties promise, covenant and agree as follows:

## 1.0 GENERAL CONDITIONS

**1.1 Development Obligation.** Developer shall be responsible for performance of the covenants set forth herein. Unless as otherwise amended within this Agreement, the Developer shall be responsible for performance of all requirements in this Agreement.

**1.2 Engineering and Surveying Services.** Developer agrees to furnish, at its expense, all necessary engineering and surveying services relating to the design layout and construction of the Improvements depicted on Exhibit "A" attached hereto and fully incorporated herein by this reference. Said engineering services shall be performed by or under the supervision of a Registered Professional Engineer or Registered Land Surveyor, or other professionals as appropriate, licensed by the State of Colorado, and in accordance with applicable Colorado law, and shall conform to the standards and criteria for public improvements as established and approved by the City as of the date of submittal to the City.

**1.3 Construction Standards.** Developer shall construct all Improvements required by this Agreement, in accordance with plans and specifications approved in writing by the City, in conformance with all applicable codes and ordinances as adopted by the City, and in full conformity with the City's construction and specifications applicable at the time of actual construction.

**1.4 Development Coordination.** Unless specifically provided in this Agreement to the contrary, all submittals to the City or approvals required of the City in connection with this Agreement shall be submitted to or rendered by the City Administrator, or his designee, who shall have general responsibility for coordinating development with Developer.

**1.5 Construction Acceptance and Warranty.** No later than ten (10) days after the Improvements are completed, Developer shall request and the City shall provide inspection by the City. If Developer does not request this inspection within ten (10) days of completion of the Improvements, the City may conduct the inspection without the request of Developer. Developer shall provide "as-built" drawings no later than thirty (30) days after the Improvements are completed. If the Improvements completed by Developer are satisfactory, the City shall grant construction acceptance ("Construction Acceptance") within ten (10) days of the Developer's submission of "as-built" drawings, which shall be subject to final acceptance ("Final Acceptance") as set forth herein. If the Improvements completed by Developer do not satisfy the conditions of this Agreement, the City shall provide written notice to Developer of the repairs, replacements, construction or other work required to receive Construction Acceptance within ten (10) days from the date of City inspection. Developer shall complete all needed repairs, replacements, construction or other work within thirty (30) days of said notice, weather permitting. After Developer does complete the repairs, replacements, construction or other work required, Developer shall request a re-inspection of such work within ten (10) days to determine if Construction Acceptance can be granted. The City shall provide either Construction Acceptance or written notice of additional repairs, replacements, construction or other work required to receive Construction Acceptance within ten (10) days of the re-inspection date. The City shall issue no certificate of occupancy until the City has granted the Construction Acceptance.

**1.6 Final Acceptance.** At least thirty (30) days before two (2) years has elapsed from the issuance of Construction Acceptance, or as soon thereafter as weather permits, Developer shall request a Final Acceptance inspection. The City shall inspect the Improvements and shall notify the Developer in writing of all deficiencies and necessary repairs. After Developer has corrected all deficiencies and made all necessary repairs identified in said written notice, the City shall issue to Developer a letter of Final Acceptance.

**1.7 Testing and Inspection.**

(a) At all times during construction of the public improvements, the City shall have access to inspect materials and workmanship, and all materials and work not conforming to the approved plans and specifications shall be repaired or removed and replaced at Developer's expense so as to conform to the approved plans and specifications.

(b) The Developer will be responsible for oversight of the construction of the public improvements. The Developer shall solicit and retain a third-party engineer or inspector, solely at Developer's cost, to perform oversight, provided the engineer/inspector's qualifications are approved by the City prior to commencement of construction of the public improvements. The Developer will provide the resume of the third-party engineer, or other qualified inspector(s), of the construction and installation of such improvements before construction may begin. The City Engineer or the City's designee shall determine the amount of oversight required, after consultation with the Developer. The third party engineer engaged for oversight and inspection pursuant to this paragraph may be the same engineer engaged for inspection of improvements to be dedicated to the metropolitan district for the Subject Property.

(c) All testing required by the City's *"Standards and Specifications for the Design and Construction of Public Improvements"* shall be the responsibility of the Developer. All test reports shall be provided to the City Engineer.

(d) All work shown on the Improvements plans requires inspection by the City. Inspection services are provided Monday through Friday, except legal holidays, from 8:00 a.m. to 4:00 p.m. During the hours listed above and except as otherwise provided for in advance, inspections shall be scheduled a minimum of three (3) business days in advance.

**1.8 Indemnification and Release of Liability.** Developer agrees to defend, indemnify and hold harmless the City, its officers, employees, agents or servants, and to pay any and all judgments rendered against said persons on account of any suit, actions or claim caused by, arising from, or on account of acts or omissions by the Developer, its officers, employees, agents, consultants, contractors and subcontractors; provided, however, that Developer's obligation herein shall not apply to the extent said suit, action or claim results from any acts or omissions of officers, employees, agents or servants of the City. Said obligation of Developer shall be limited to suits, actions or claims based upon conduct prior to Final Acceptance by the City of the construction work. Developer acknowledges that the City's review and approval of plans for development of the Subject Property is done in furtherance of the general public's health, safety and welfare and that no immunity is waived and no specific relationship with, or duty of care to, the Developer or third parties is assumed by such review approval.

**1.9 Insurance OSHA.** Developer shall furnish to the City upon request proof thereof that all employees and contractors engaged in the construction of Improvements are covered by adequate Worker's Compensation Insurance and Public Liability Insurance and shall require faithful compliance with all provisions of the Federal Occupational Safety and Health Act (OSHA).

## 2.0 CONSTRUCTION OF IMPROVEMENTS

**2.1 Rights-of-Way, Easements and Permits.** Before the City may approve construction plans for any Improvements herein agreed upon, Developer shall acquire or dedicate, at its own expense, all rights-of-way and easements depicted on the Plat, as required by the City for the construction of the Improvements. All such conveyances shall be free and clear of liens, taxes and encumbrances and shall be by the Plat or deed, easement, license, agreement in form and substance acceptable to the City Administrator or the Administrator's designee. All title documents shall be recorded at the Developer's expense.

## 3.0 INFRASTRUCTURE IMPROVEMENTS

**3.1 Public Improvements.** The Developer agrees to construct phased public improvements (the "Improvements), within the Subdivision, depicted on **Exhibit "A"** attached hereto and fully incorporated herein by this reference. The Developer shall be responsible for providing the City with a Security Bond, Letter of Credit, or cash deposit with the City (the "Security") guaranteeing installation of the Improvements that are not completed prior to issuance of the first building permit for each Phase. The amount shall be one hundred twenty-five percent (125%) of the applicable phased estimated cost of the required Improvements per **Exhibit "B"** (updated with current construction costs at time of Phase construction) attached hereto and fully incorporated herein by this reference. Phasing of improvements shall be in accordance with the Phasing Map attached hereto as **Exhibit "D"**, provided that the City and Developer acknowledge that this Agreement shall cover the residential Phases 1-4 shown on **Exhibit "D"** and the improvements within the commercial Phase 5 shown on **Exhibit "D"** shall be governed by the terms of a separate subdivision improvements agreement to be entered into between the City and the developer of such commercial Phase 5 prior to the development thereof, and which commercial subdivision improvements agreement shall be in substantially the same form as this agreement. The City may accept portions of the Improvements, reducing the Security for each portion completed and accepted by the City, to no less than twenty-five percent (25%) of the actual or estimated construction costs, whichever is greater, for each completed system. Each Improvement phase shall define a system, i.e. roadways system, sewer system, water system. The remaining twenty-five percent (25%) percent for each system shall be retained to secure the Developer's warranty during the designated warranty period. A warranty period of two (2) years as set forth in Section 1.6 hereof shall apply to all public improvements. The City shall release or return the Security to the Developer within Thirty (30) days of receipt of the Conditional Acceptance as provided in paragraph 1.5 herein, less the twenty-five percent (25%) of construction costs to be retained during the warranty period. Upon Final Acceptance of the Improvements as provided in paragraph 1.6 herein, the twenty-five percent (25%) Security retained during the warranty period shall be released or returned to the Developer within Thirty (30) days of issuance of the Final Acceptance.

**3.2 Non-Potable Water Public Improvements**. The Developer will construct non-potable water main improvements (the "NPW") for the purposes of providing raw water to the Development for landscape irrigation. Construction and probationary acceptance of the NPW shall entitle the Developer to the Raw Water Equivalents per Paragraph 6.4 of this Agreement. No tap fees shall be incurred for the NPW on any lot in the Development; however, applicable meter costs shall be apply per the current meter fee schedule at the time of building permit application for each individual lot.

## 4.0 LANDSCAPE, PARK AND TRAIL IMPROVEMENTS

The Developer agrees to construct certain Landscape, Park and Trail improvements located within the Subdivision (the "Landscape, Park and Trail Improvements") per the approved P.U.D. referenced as **Exhibit "C**" attached hereto and fully incorporated herein by this reference, as part of the Phase Improvements. The surety shall be in the amount of one hundred twenty-five percent (125%) of the estimated cost of the Landscape, Park and Trail Improvements as shown on **Exhibit "C".** The Landscape, Park and Trail Improvements are depicted on the Murata Farms Preliminary Plat/PUD submittal of Landscape Plans submitted by henry design group dated May 6, 2021, incorporated herein by reference.

## 5.0 SPECIFICATIONS.

All street improvements, curb, gutter and sidewalks and appurtenances thereto, water mains, sewer mains and stormwater improvements shall be constructed and installed so as to meet or exceed City-approved plans, specifications and the Improvements described on **Exhibit "B"** Public Improvements and **Exhibit "C"** Landscape and Park Improvements. All streets within the Subdivision shall be constructed to City Standards and Specifications per the approved Construction Plans and based upon a site-specific geotechnical study and pavement design. All streetscaping will meet the requirements of the Fort Lupton Subdivision Regulations. Detention pond improvements will be required at the time of construction on the site as determined by the Phase III Drainage Study submitted.

## 6.0 OTHER REQUIREMENTS

**6.1 Trash, Debris, Mud.** Developer agrees that, during construction of the Development and Improvements described herein, Developer shall take any and all steps necessary to control trash, debris and wind or water erosion in the Development. Developer agrees to take any and all steps necessary to prevent the transfer of mud or debris from the construction site into public rights-of-way and to immediately remove such mud and debris from public rights-of-way after notification by the City. If these requirements are not met, the developer will be responsible for reimbursing the City for any costs incurred by the City in mitigating impacts of trash, debris, and mud.

**6.2 Erosion Control and Sedimentation Plan.** Developer agrees to submit an erosion control and sedimentation plan for review and approval by the City Engineer prior to commencement of construction on the site. Each individual lot will require erosion control measures be taken. Colorado State permits required shall be the responsibility of the Developer.

**6.3 Colorado Big Thompson (CBT) Water Shares or equivalent.** Developer agrees to dedicate to the City the appropriate water required by the applicable City Codes and regulations and deliverable to the City Water Treatment Plant at the time of development. The City will not receive dedication or supply water service to the project until and unless the subject property is included within the Northern Colorado Water Conservancy District and Municipal Sub-District. The Developer may, at its discretion, elect to pay cash-in-lieu to the City to satisfy the CBT water dedication requirement in accordance with City Council Resolution 2020R060. Said cash-in-lieu payments will be made on a per-lot basis at the time of Final Plat recordation. Dedicated CBT water shares shall remain attached to platted lots.

**6.4 Equivalent Shares.** The City herein agrees that the Developer may satisfy the CBT Water Shares or equivalent requirement of Paragraph 6.3 by purchasing equivalents via cash-in-lieu at a cost of 25% of current market price or $15,000 (whichever is more) per platted lot, in accordance with Resolution No. 2020R060. The development must include extension and installation of a dual water system and provide irrigation water from the City's well system.

**6.5 Off-Site Public Improvements Cost Shares.** The City executed a Cost Recovery Agreement with the Mountain Sky Metropolitan District for public improvements that benefit this development. Reimbursement payment to the City will be required pursuant to the Cost Recovery Agreement following issuance of District bonds based on the following:

| | |
|---|---|
| Water Main Extension | $563.17 per ¾" service tap |
| Non-potable Water Main Extension | $214.12 per ¾" service connection |
| S College Avenue Paving | $277,273.79 (half of paved section along frontage) |
| Highway 52 Deceleration Lane | To Be Determined based on proportionate share of Traffic Study traffic count |

## 7.0 MISCELLANEOUS TERMS

**7.1 Local Codes and Ordinances.** In addition to any of the items listed in this Agreement, all construction in the Development is subject to all local Codes and Ordinances as adopted by the City subject to exceptions agreed or granted.

**7.2 Recording of Agreement.** The City shall record this Agreement at Developer's expense in the office of the Clerk and Recorder, County of Weld, State of Colorado, and the City shall retain the recorded Agreement.

**7.3 Binding Effect of Agreement/Assignment.** This Agreement shall run with the land included within the Development and shall inure to the benefit of and be binding upon the successors and assigns of the parties hereto. Developer shall have the right by written instrument to assign its rights and obligations hereunder to any successor owner of the Subject Property, which assignment and assumption may be accomplished on a Phase by Phase basis. Developer shall provide written notice to the City of any such assignment and assumption, along with a copy of the executed assignment and assumption instrument.

**7.4 Modification and Waiver.** No modification of the terms of this Agreement shall be valid unless in writing and executed with the same formality as this Agreement, and no waiver of the breach of the provisions of any section of this Agreement shall be construed as a waiver of any subsequent breach of the same section or any other sections which are contained herein.

**7.5 Notices.** Any notice or communication required or permitted hereunder shall be given in writing and shall be personally delivered or sent by United States mail, postage prepaid, registered or certified mail, return receipt requested, addressed as follows:

CITY: City of Fort Lupton
Attention: City Administrator
130 South McKinley Avenue
Fort Lupton, Colorado 80621

DEVELOPER: Coronado West, LLC
8655 S. Priest St.
Tempe, AZ 85285
Attention: John Cork

or to such other address or the attention of such other person(s) as hereafter designated in writing by the applicable parties in conformance with this procedure. Notices shall be effective upon mailing or personal delivery in compliance with this paragraph.

**7.6 Force Majeure.** Whenever Developer is required to complete construction, maintenance, repair or replacement of Improvements by an agreed upon deadline, the City shall grant a reasonable extension of time if the performance cannot, as a practical matter, be completed in a timely manner due to acts of God or other circumstances constituting force majeure or beyond the reasonable control of the Developer.

**7.7 Approvals.** Whenever approval or acceptance of a matter is required or requested of the City pursuant to any provisions of this Agreement, the City shall act reasonably in responding to such matter, and no such approval or acceptance shall be unreasonably withheld or delayed.

**7.8 Title and Authority.** Developer warrants to the City that it is the record owner of the Subject Property upon which the Development shall be constructed or is acting in accordance with the authority of the owner. The undersigned further warrants to have full power and authority to enter into this Agreement.

**7.9 Severability.** This Agreement is to be governed and construed according to the laws of the State of Colorado. In the event that any provision of this Agreement is held to be violative of city, state or federal laws and hereby rendered unenforceable, either party, in its sole discretion, may determine whether the remaining provisions will or will not remain in force.

**IN WITNESS WHEREOF,** the Parties hereto have caused their duly authorized officials to place their hands and seals upon this Agreement the day and year first above written.

**CITY OF FORT LUPTON,** a Colorado municipal corporation

By: _____
Zo Stieber
Mayor

STATE OF COLORADO )
) ss.
COUNTY OF WELD )

SUBSCRIBED AND SWORN to before me this _____ day of _____ 2022, by Zo Stieber as Mayor of the City of Fort Lupton, Colorado.

WITNESS my hand and official seal.

MY COMMISSION EXPIRES: _____

_____
Notary Public

**Coronado West, LLC**, a Delaware Limited Liability Company

By:_____
John Cork

STATE OF_____ )
) ss.
COUNTY OF _____ )

SUBSCRIBED AND SWORN to before me this _____ day of _____ 2022, by John Cork, as the President of Coronado West, LLC.

WITNESS my hand and official seal.

MY COMMISSION EXPIRES: _____

_____
Notary Public

CITY OF
Fort Lupton
EST 1836

Public Works

130 S. McKinley Avenue
Fort Lupton, CO 80621
Phone: 303-857-6694
Fax: 303.857.0351
www.fortluptonco.gov

**Exhibit "A" to Murata Farms SIA**

**Improvements by Phase**

I:\2019\19032 - Murata Farms\CADD\Exhibits\SIA\SIA EXH - ST.dwg tab: A1 PHASE 1 STREET IMPROVEMENTS Aug 20, 2021 - 4:05pm tfrazier

HIGHWAY 52 IMPROVEMENTS IN PHASE 1

HIGHWAY 52 IMPROVEMENTS IN PHASE 1

COLORADO STATE HWY 52

UNPLATTED
ASSESSED OWNER:
PATRICIA L. TERRY TRUST
REC. NO. 4362422

LOT A
RECORDED
EXEMPTION NO.
1471-04-3-RE 879
REC. NO. 02065102
ASSESSED OWNER:
PATRICIA L. TERRY TRUST
REC. NO. 4362422

ASSESSED OWNER:
APPEL FARMS HOA
REC. NO. 3922065

FUTURE PHASE

END MEADOWLARK PARKWAY IN PHASE 1

TYPE 3 BARRICADE

FUTURE PHASE

FUTURE PHASE

S. GERRY AVENUE

MEADOWLARK PARKWAY

PHASE 1

SAGE GROUSE AVE.

BLUEBIRD AVE.

MOUNTAIN FLOWER AVE.

MEADOWLARK PARKWAY

SECTION
ACCESS TO
MOUNTAIN

LAKE SPARROW STREET

SILVERADO LANE

ROCK WREN STREET

WOOD THRUSH AVE.

SILVERADO LANE

BARN OWL AVE.

PHASE 2

HUMMINGBIRD AVE.

MOURNING DOVE AVE.

LARK BUNTING STREET

S. COLLEGE AVE.

ASSESSED OWNER:
APPEL FARMS HOA
REC. NO. 3922065

MOUNTAIN SKY FILING NO. 1

MOUNTAIN SKY FILING NO. 1

Redland
WHERE GREAT PLACES BEGIN
720.283.1798 Office
1560 West Caswell Court
Littleton, Colorado 80120
REDLAND.COM

| | |
|---|---|
| DATE | 8/20/21 |
| DRAWN | BRC |
| CHECKED | TJF |
| APPROVED | TJF |
| PROJECT NO. | 19032 |

# PHASE 1 STREET IMPROVEMENTS

## MURATA FARMS FILING NO. 1

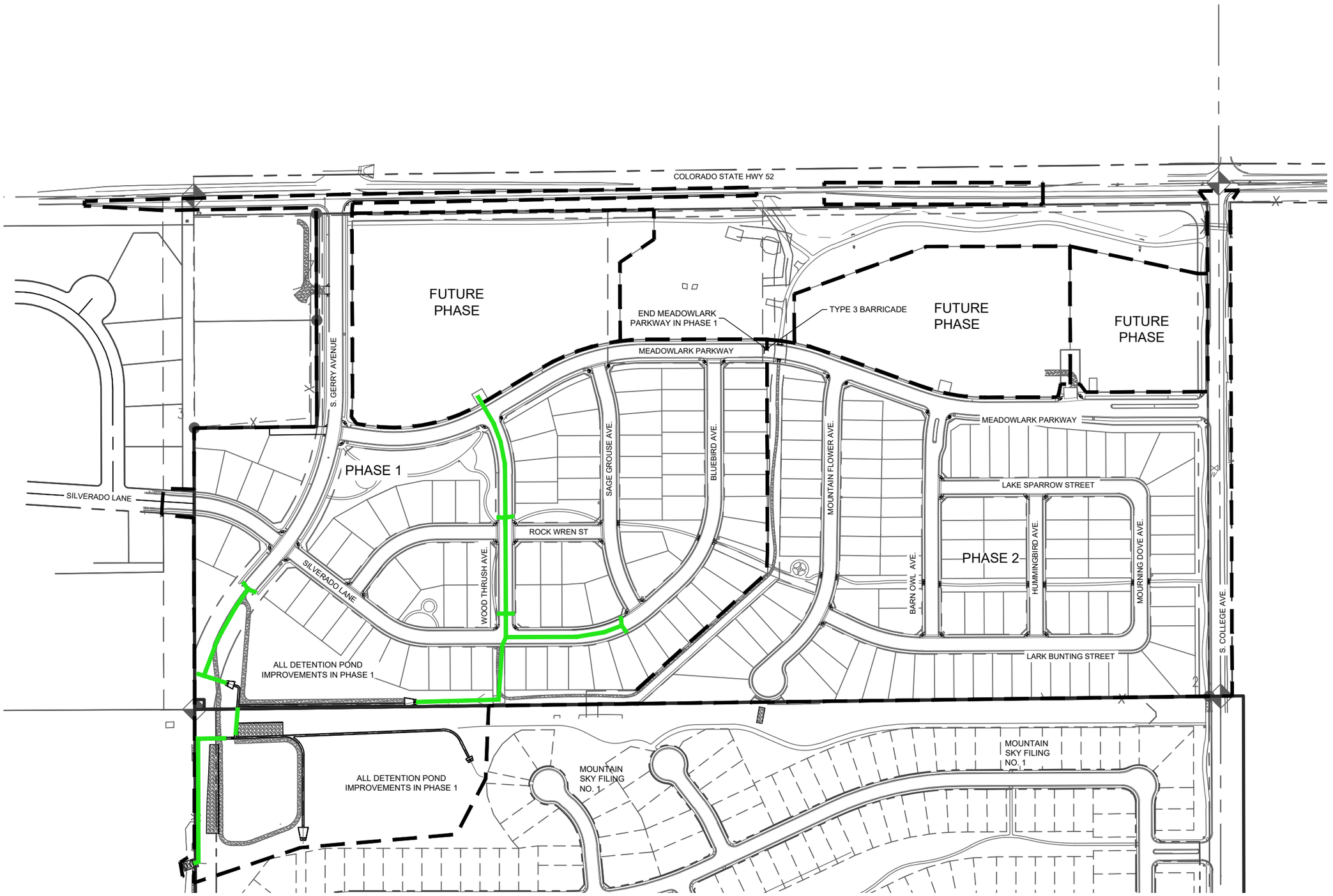
SIA

FT LUPTON

CO

SHEET
A1

I:\2019\19032 - Murata Farms\CADD\Exhibits\SIA\SIA EXH - STM.dwg tab: A2 PHASE 1 STORM IMPROVEMENTS Aug 20, 2021 - 4:06pm tfrazier




Redland
WHERE GREAT PLACES BEGIN
720.283.6783 Office
1560 West Caudill Court
Littleton, Colorado 80120
REDLAND.COM

| | |
|---|---|
| DATE | 8/20/21 |
| DRAWN | BRC |
| CHECKED | TJF |
| APPROVED | TJF |
| PROJECT NO. | 19032 |

# PHASE 1 STORM IMPROVEMENTS

## MURATA FARMS FILING NO. 1

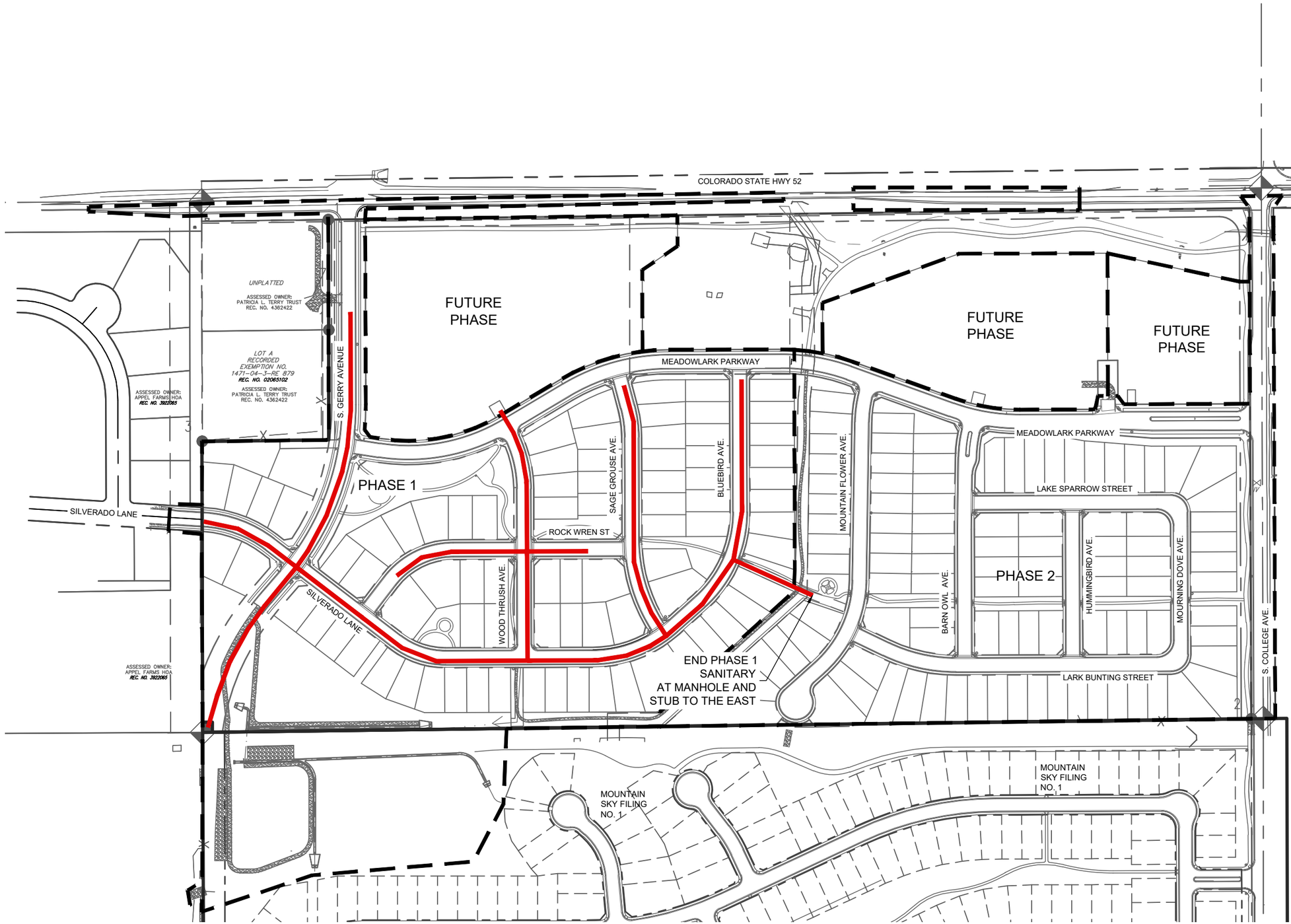
SIA

FT LUPTON

CO

SHEET
A2

I:\2019\19032 - Murata Farms\CADD\Exhibits\SIA\SIA EXH - SAN.dwg tab: A3 PHASE 1 SANITARY IMPROVEMENTS Aug 20, 2021 - 4:06pm tfrazier





Redland
WHERE GREAT PLACES BEGIN
720.283.1790 Office
1560 West Caskill Court
Littleton, Colorado 80120
REDLAND.COM


| | |
|---|---|
| DATE | 8/20/21 |
| DRAWN | BRC |
| CHECKED | TJF |
| APPROVED | TJF |
| PROJECT NO. | 19032 |

# PHASE 1 SANITARY IMPROVEMENTS

## MURATA FARMS FILING NO. 1

SIA

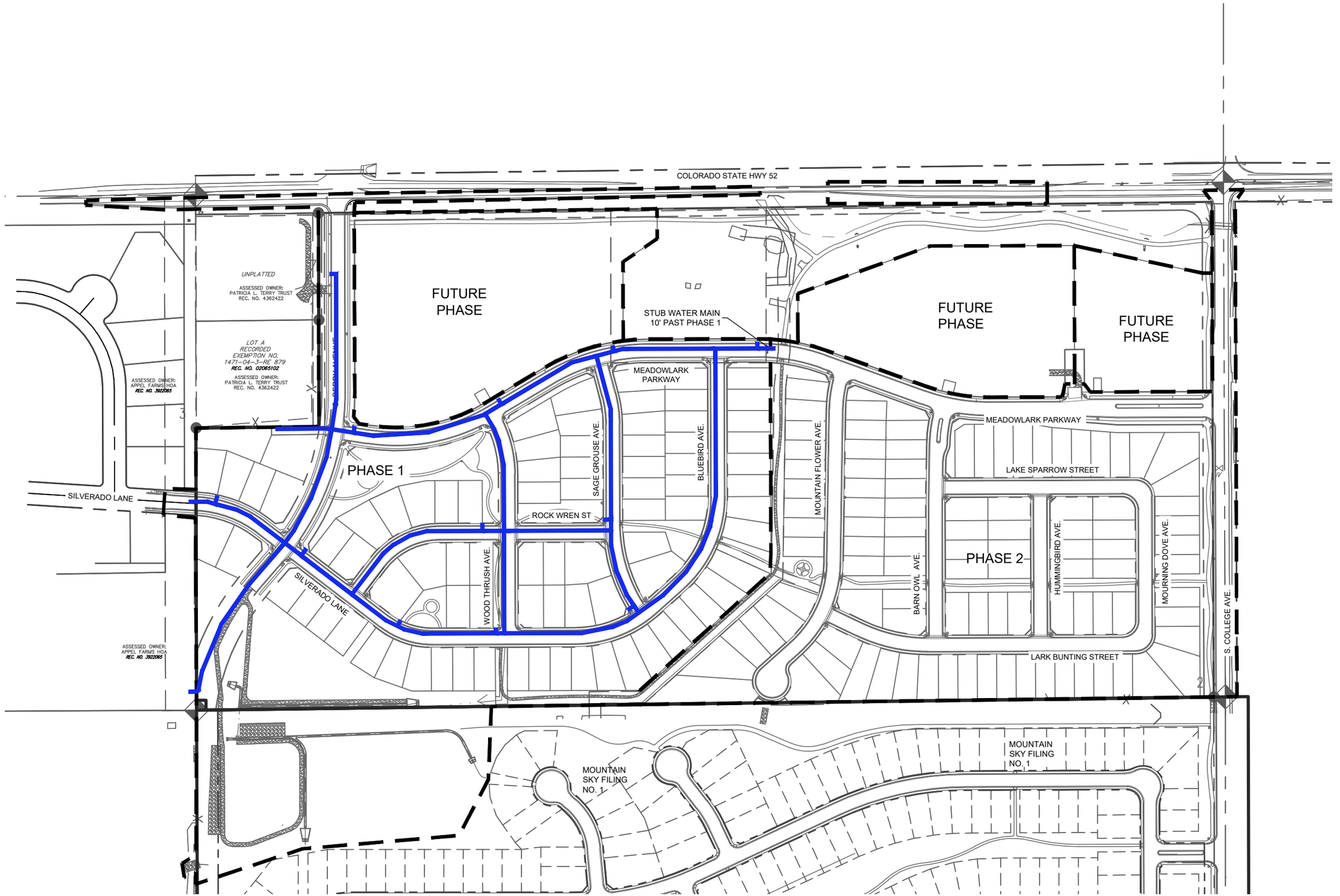
FT LUPTON

CO

SHEET

A3

I:\2019\19032 - Murata Farms\CADD\Exhibits\SIA\SIA EXH - WATER.dwg tab: A4 PHASE 1 WATER IMPROVEMENTS Aug 20, 2021 - 4:07pm tfrazier




Redland
WHERE GREAT PLACES BEGIN
720.283.1790 Office
1560 West Caskill Court
Littleton, Colorado 80120
REDLAND.COM

| | |
|---|---|
| DATE | 8/20/21 |
| DRAWN | BRC |
| CHECKED | TJF |
| APPROVED | TJF |
| PROJECT NO. | 19032 |

# PHASE 1 WATER IMPROVEMENTS

## MURATA FARMS FILING NO. 1

SIA

FT LUPTON

CO

SHEET
A4

I:\2019\19032 - Murata Farms\CADD\Exhibits\SIA\SIA EXH - NP.dwg tab: A5 PHASE 1 NON-POTABLE WATER IMPROVEMENTS Aug 20, 2021 - 4:07pm tfrazier

COLORADO STATE HWY 52

UNPLATTED
ASSESSED OWNER:
PATRICIA L. TERRY TRUST
REC. NO. 4362422

LOT A
RECORDED
EXEMPTION NO.
1471-04-3-RE 879
REC. NO. 02065102

ASSESSED OWNER:
PATRICIA L. TERRY TRUST
REC. NO. 4362422

ASSESSED OWNER:
APPEL FARMS HOA
REC. NO. 3922065

S. GERRY AVENUE

FUTURE PHASE

STUB NON POTABLE WATER MAIN 10' PAST PHASE 1

MEADOWLARK PARKWAY

FUTURE PHASE

FUTURE PHASE

PHASE 1

SILVERADO LANE

ROCK WREN ST

SAGE GROUSE AVE.

BLUEBIRD AVE.

MOUNTAIN FLOWER AVE.

WOOD THRUSH AVE.

SILVERADO LANE

MEADOWLARK PARKWAY

LAKE SPARROW STREET

BARN OWL AVE.

PHASE 2

HUMMINGBIRD AVE.

MOURNING DOVE AVE.

S. COLLEGE AVE.

LARK BUNTING STREET

ASSESSED OWNER:
APPEL FARMS HOA
REC. NO. 3922065

MOUNTAIN SKY FILING NO. 1

MOUNTAIN SKY FILING NO. 1

Redland
WHERE GREAT PLACES BEGIN
720.283.1798 Office
1560 West Caudill Court
Littleton, Colorado 80120
REDLAND.COM

| | |
|---|---|
| DATE | 8/20/21 |
| DRAWN | BRC |
| CHECKED | TJF |
| APPROVED | TJF |
| PROJECT NO. | 19032 |

PHASE 1 NON-POTABLE WATER IMPROVEMENTS

# MURATA FARMS FILING NO. 1

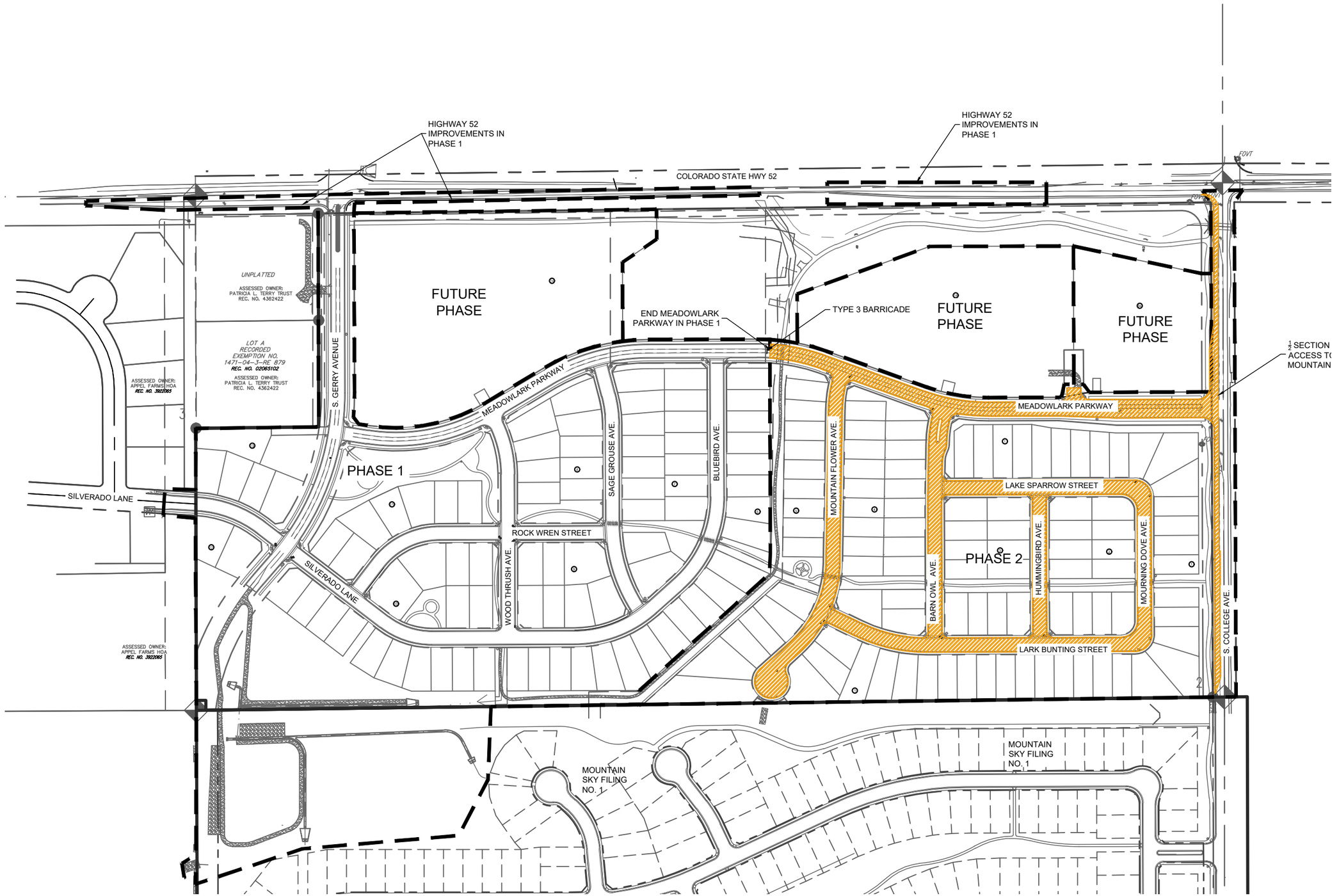
SIA

FT LUPTON

CO

SHEET
A5

I:\2019\19032 - Murata Farms\CADD\Exhibits\SIA\SIA EXH - ST.dwg tab: A6 PHASE 2 STREET IMPROVEMENTS Aug 20, 2021 - 4:07pm tfrazier




Redland
WHERE GREAT PLACES BEGIN
720.283.1798 Office
1560 West Caswell Court
Littleton, Colorado 80120
REDLAND.COM

| | |
|---|---|
| DATE | 8/20/21 |
| DRAWN | BRC |
| CHECKED | TJF |
| APPROVED | TJF |
| PROJECT NO. | 19032 |

# PHASE 2 STREET IMPROVEMENTS

## MURATA FARMS FILING NO. 1

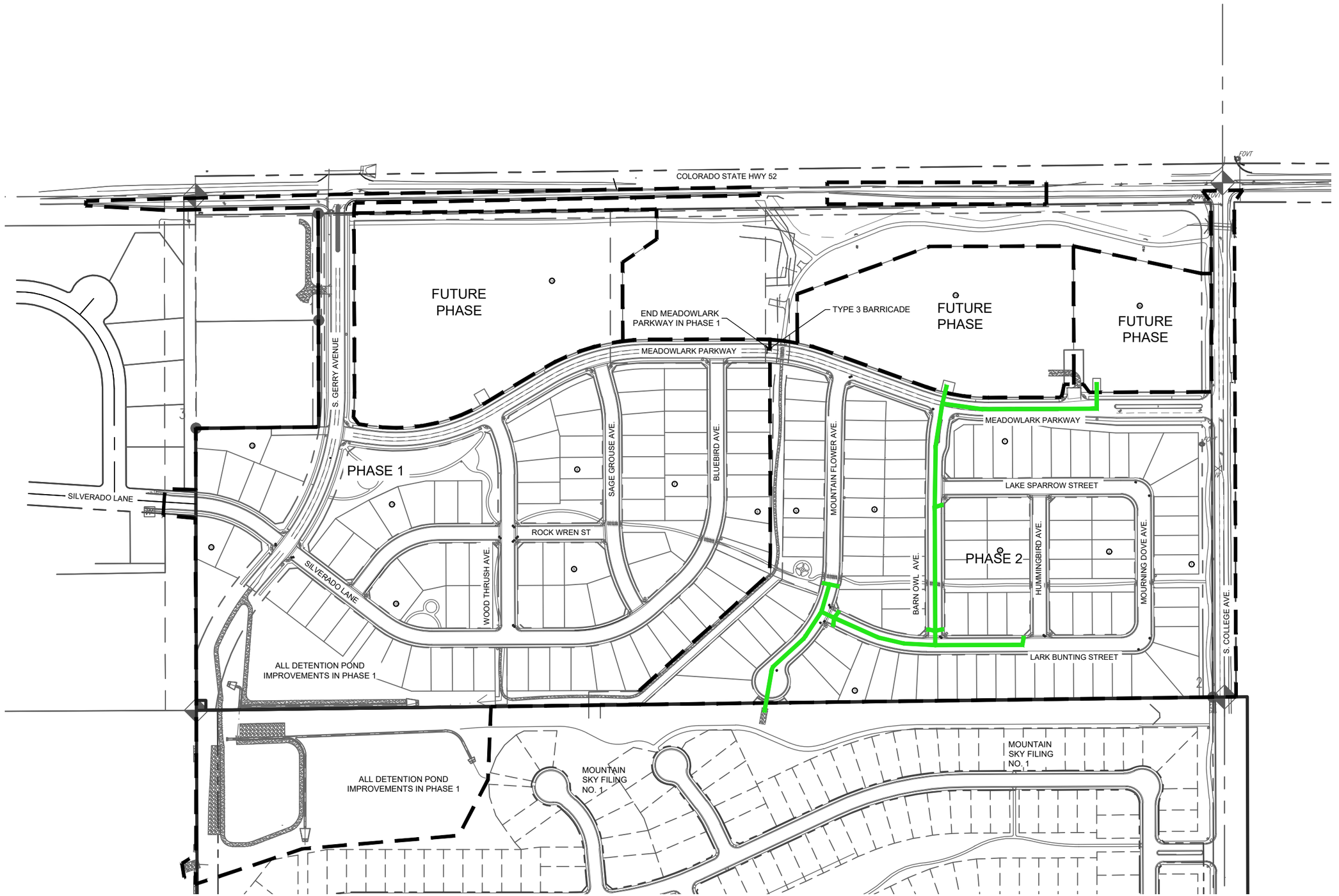
SIA

FT LUPTON

CO

SHEET
A6

I:\2019\19032 - Murata Farms\CADD\Exhibits\SIA\SIA EXH - STM.dwg tab: A7 PHASE 2 STORM IMPROVEMENTS Aug 20, 2021 - 4:08pm tfrazier




Redland
WHERE GREAT PLACES BEGIN
720.283.6783 Office
1560 West Cavalli Court
Littleton, Colorado 80120
REDLAND.COM

| | |
|---|---|
| DATE | 8/20/21 |
| DRAWN | BRC |
| CHECKED | TJF |
| APPROVED | TJF |
| PROJECT NO. | 19032 |

# PHASE 2 STORM IMPROVEMENTS

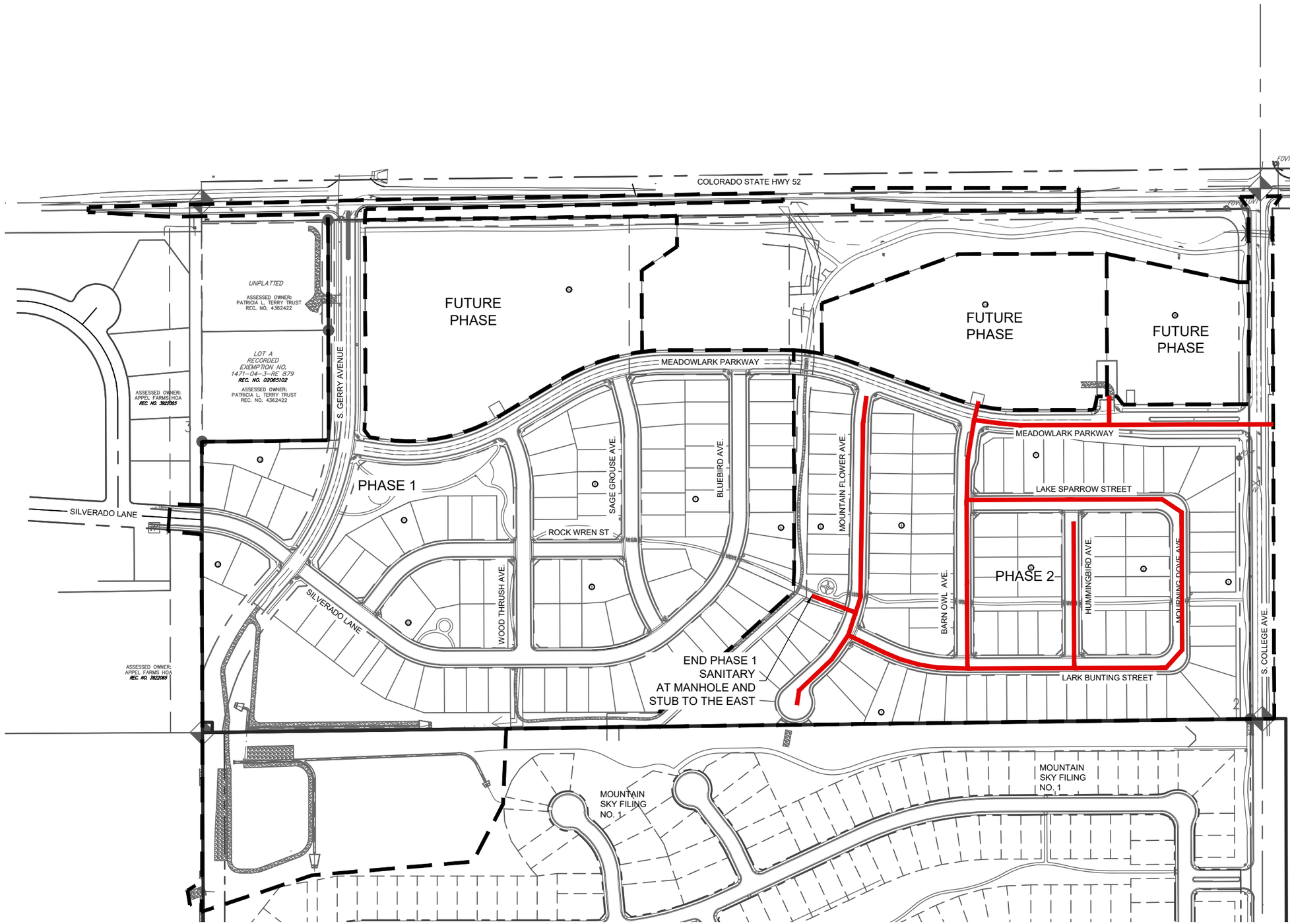
## MURATA FARMS FILING NO. 1

SIA

FT LUPTON CO

SHEET
A7

I:\2019\19032 - Murata Farms\CADD\Exhibits\SIA\SIA EXH - SAN.dwg tab: A8 PHASE 2 SANITARY IMPROVEMENTS Aug 20, 2021 - 4:08pm tfrazier




Redland
WHERE GREAT PLACES BEGIN
720.283.6783 Office
1560 West Canal Court
Littleton, Colorado 80120
REDLAND.COM

| | |
|---|---|
| DATE | 8/20/21 |
| DRAWN | BRC |
| CHECKED | TJF |
| APPROVED | TJF |
| PROJECT NO. | 19032 |

# PHASE 2 SANITARY IMPROVEMENTS

## MURATA FARMS FILING NO. 1

SIA

FT LUPTON

CO

SHEET
A8

COLORADO STATE HWY 52

UNPLATTED
ASSESSED OWNER:
PATRICIA L. TERRY TRUST
REC. NO. 4362422

LOT A
RECORDED
EXEMPTION NO.
1471-04-3-RE 879
REC. NO. 02065102

ASSESSED OWNER:
PATRICIA L. TERRY TRUST
REC. NO. 4362422

ASSESSED OWNER:
APPEL FARMS HOA
REC. NO. 3922085

ASSESSED OWNER:
APPEL FARMS HOA
REC. NO. 3922085

FUTURE PHASE

FUTURE PHASE

FUTURE PHASE

FUTURE PHASE

PHASE 1

PHASE 2

STUB WATER MAIN
10' PAST PHASE 1

S. GERRY AVENUE

S. COLLEGE AVE.

SILVERADO LANE

SILVERADO LANE

MEADOWLARK PARKWAY

MEADOWLARK PARKWAY

ROCK WREN ST

LAKE SPARROW STREET

LARK BUNTING STREET

SAGE GROUSE AVE.

BLUEBIRD AVE.

MOUNTAIN FLOWER AVE.

WOOD THRUSH AVE.

BARN OWL AVE.

HUMMINGBIRD AVE.

MOURNING DOVE AVE.

MOUNTAIN SKY FILING NO. 1

MOUNTAIN SKY FILING NO. 1

EOVT

EOVT

EOVT

EOVT

Redland
WHERE GREAT PLACES BEGIN
720.283.6783 Office
1560 West Cavalli Court
Littleton, Colorado 80120
REDLAND.COM

| | |
|---|---|
| DATE | 8/20/21 |
| DRAWN | BRC |
| CHECKED | TJF |
| APPROVED | TJF |
| PROJECT NO. | 19032 |

# PHASE 2 WATER IMPROVEMENTS

## MURATA FARMS FILING NO. 1

SIA

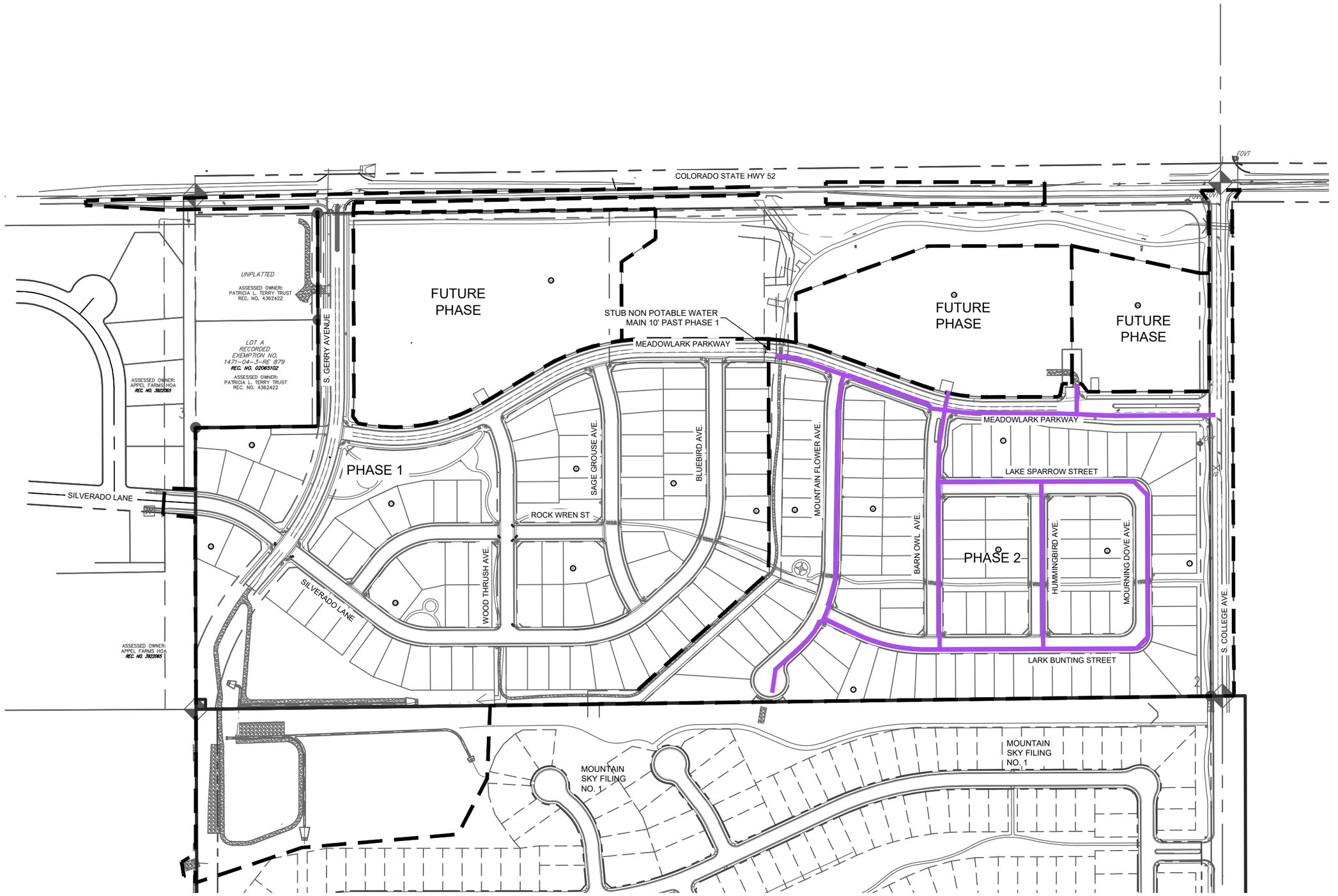
FT LUPTON

CO

SHEET
A9

I:\2019\19032 - Murata Farms\CADD\Exhibits\SIA\SIA EXH - WATER.dwg tab: A9 PHASE 2 WATER IMPROVEMENTS Aug 20, 2021 - 4:08pm tfrazier

I:\2019\19032 - Murata Farms\CADD\Exhibits\SIA\SIA EXH - NP.dwg tab: A10 PHASE 2 NON-POTABLE WATER IMPROVEMENTS Aug 20, 2021 - 4:09pm tfrazier




Redland
WHERE GREAT PLACES BEGIN
720.283.1790 Office
1560 West Caskill Court
Littleton, Colorado 80120
REDLAND.COM

| | |
|---|---|
| DATE | 8/20/21 |
| DRAWN | BRC |
| CHECKED | TJF |
| APPROVED | TJF |
| PROJECT NO. | 19032 |

PHASE 2 NON-POTABLE WATER IMPROVEMENTS

# MURATA FARMS FILING NO. 1

SIA

FT LUPTON

CO

SHEET
A10

CITY OF
Fort Lupton
EST 1836

Public Works

130 S. McKinley Avenue
Fort Lupton, CO 80621
Phone: 303-857-6694
Fax: 303.857.0351
www.fortluptonco.gov

**Exhibit "B" to Murata Farms SIA**

**Cost of Improvements by Phase**

Redland
WHERE GREAT PLACES BEGIN
720.283.6783 Office
1500 West Canal Court
Littleton, Colorado 80120
REDLAND.COM

# Murata Farms Filing No. 1

## Exhibit B - SIA Phase I Public Improvements

**Opinion of Probable Cost Estimate**

Date: August 20, 2021

JN: 19.032

| | Mobilization | QUANTITY | UNIT | UNIT PRICE | TOTAL COST |
|---|---|---|---|---|---|
| 101 | Mobilization (grading, utilities, streets) | 1 | LS | $30,000.00 | $30,000 |
| | | | | Mobilization Subtotal | $30,000 |

| | Storm Sewer | QUANTITY | UNIT | UNIT PRICE | TOTAL COST |
|---|---|---|---|---|---|
| 401 | 18" RCP (0-8' depth) | 50 | LF | $55.00 | $2,750 |
| 402 | 24" RCP (0-8' depth) | 353 | LF | $75.00 | $26,475 |
| 403 | 30" RCP (0-8' depth) | 265 | LF | $90.00 | $23,850 |
| 404 | 36" RCP (0-8' depth) | 366 | LF | $125.00 | $45,750 |
| 406 | 48" RCP (0-8' depth) | 304 | LF | $160.00 | $48,640 |
| 434 | 54" RCP (0-8' depth) | 358 | LF | $180.00 | $64,440 |
| 406A | 60" RCP (0-8' depth) | 70 | LF | $210.00 | $14,700 |
| 410 | 5' Dia. Manhole | 10 | EA | $6,000.00 | $60,000 |
| 411 | 6' Dia. Manhole | 2 | EA | $6,500.00 | $13,000 |
| 412 | Box Base Manhole | 4 | EA | $7,500.00 | $30,000 |
| 413 | 5' Type 'R' Inlet | 1 | EA | $6,000.00 | $6,000 |
| 414 | 10' Type 'R' Inlet | 7 | EA | $7,000.00 | $49,000 |
| 415 | 15' Type 'R' Inlet | 2 | EA | $8,500.00 | $17,000 |
| 430 | Type 'D' Inlet | 2 | EA | $7,500.00 | $15,000 |
| 428 | 60" Flared End Section | 2 | EA | $5,000.00 | $10,000 |
| 431 | Pond Outlet Structure | 1 | EA | $15,000.00 | $15,000 |
| 432 | Type 'L' Rip Rap | 643 | CY | $100.00 | $64,322 |
| 435 | Concrete Cutoff Wall | 345 | LF | $80.00 | $27,600 |
| 436 | Trickle Channel | 1,436 | LF | $25.00 | $35,900 |
| 437 | Gravel Access Road | 28,425 | SF | $1.50 | $42,638 |
| 438 | Concrete Forebay | 4 | EA | $7,500.00 | $30,000 |
| | | | | Storm Sewer Subtotal | $642,065 |

Redland
WHERE GREAT PLACES BEGIN

# Murata Farms Filing No. 1

## Exhibit B - SIA Phase I Public Improvements

**Opinion of Probable Cost Estimate**

Date: August 20, 2021

JN: 19.032

| | Water | QUANTITY | UNIT | UNIT PRICE | TOTAL COST |
|---|---|---|---|---|---|
| 501 | Connect to Existing Main | 2 | EA | $2,500.00 | $5,000 |
| 504 | 8" C-900 CL 150 | 4,130 | LF | $42.00 | $173,460 |
| 505 | 12" C-900 CL 150 | 1,210 | LF | $60.00 | $72,600 |
| 520 | 10" C-900 CL 150 | 1,189 | LF | $52.00 | $61,828 |
| 503 | 6" CL-52 DIP | 173 | LF | $45.00 | $7,785 |
| 502 | Fire Hydrant Assembly | 13 | EA | $6,000.00 | $78,000 |
| 506 | 8" - 11 ¼° Bend w/ Kick Block | 27 | EA | $600.00 | $16,200 |
| 514 | 8" Gate Valve | 24 | EA | $2,000.00 | $48,000 |
| 521 | 10" Gate Valve | 6 | EA | $2,500.00 | $15,000 |
| 522 | 10" x 10" Cross Fitting | 1 | EA | $750.00 | $750 |
| 523 | 10" x 6" Tee Fitting | 1 | EA | $750.00 | $750 |
| 524 | 10" x 12" Cross Fitting | 1 | EA | $750.00 | $750 |
| 525 | 10" - 45° Bend w/ Kick Block | 2 | EA | $750.00 | $1,500 |
| 526 | 10" - 11 ¼° Bend w/ Kick Block | 6 | EA | $750.00 | $4,500 |
| 527 | Air Release Manhole | 1 | EA | $5,000.00 | $5,000 |
| 528 | 12" x 12" Tee Fitting | 3 | EA | $950.00 | $2,850 |
| 529 | 12" x 6" Tee Fitting | 4 | EA | $950.00 | $3,800 |
| 517 | 2" Blow off | 1 | EA | $2,000.00 | $2,000 |
| 515 | 12" Gate Valve | 7 | EA | $2,750.00 | $19,250 |
| 511 | 8" x 6" Tee Fitting | 8 | EA | $600.00 | $4,800 |
| 510 | 8" x 8" Tee Fitting | 6 | EA | $600.00 | $3,600 |
| | | | | Water Subtotal | $527,423 |

| | Sanitary Sewer | QUANTITY | UNIT | UNIT PRICE | TOTAL COST |
|---|---|---|---|---|---|
| 601 | Connect to Existing Main | 1 | EA | $3,500.00 | $3,500 |
| 604 | 4' Dia. Manhole (0-12' Depth) | 42 | EA | $4,250.00 | $178,500 |
| 602 | 8" SDR-35 PVC (0-12' depth) | 3,496 | LF | $42.00 | $146,832 |
| 612 | 10" SDR-35 PVC (0-12' depth) | 1,728 | LF | $48.00 | $82,944 |
| | | | | Sanitary Sewer Subtotal | $411,776 |

Redland
WHERE GREAT PLACES BEGIN

# Murata Farms Filing No. 1

## Exhibit B - SIA Phase I Public Improvements

**Opinion of Probable Cost Estimate**

Date: August 20, 2021

JN: 19.032

| | Street Improvements | QUANTITY | UNIT | UNIT PRICE | TOTAL COST |
|---|---|---|---|---|---|
| 701 | Subgrade Prep | 27,638 | SY | $3.00 | $82,914 |
| 702 | Asphalt (Full depth - 6" section) | 82,152 | SY-IN | $4.25 | $349,146 |
| 702A | Asphalt (Full depth - 8" section) | 78,734 | SY-IN | $4.25 | $334,620 |
| 704 | Subgrade Prep - Concrete Alley | 310 | SY | $1.75 | $543 |
| 705 | Concrete Alley (7" Section) | 2,171 | SY-IN | $8.00 | $17,366 |
| 706 | Alley Curb Cut / Approach | 1 | EA | $2,000.00 | $2,000 |
| 707 | Type 2 Curb and Gutter | 3,945 | LF | $22.00 | $86,790 |
| 708 | Type 1 Combination Curb, Gutter & 4' Sidewalk | 7,386 | LF | $40.00 | $295,440 |
| 708A | Type 1 Combination Curb, Gutter | 267 | LF | $25.00 | $6,675 |
| 709 | 8' Concrete Crosspan | 9 | EA | $2,000.00 | $18,000 |
| 710 | Subgrade Prep - Concrete Walk | 68,671 | SF | $1.75 | $120,174 |
| 711 | 5' Concrete Walk | 34,574 | SF | $5.50 | $190,157 |
| 712 | Handicap Ramp | 24 | EA | $1,900.00 | $45,600 |
| 713 | Mid-Block Ramp | 2 | EA | $1,500.00 | $3,000 |
| 715 | Signage | 26 | EA | $500.00 | $13,000 |
| 716 | Street Light (Local) | 15 | EA | $7,500.00 | $112,500 |
| 717 | Gravel Path | 2,884 | SF | $1.50 | $4,326 |
| | | | | Street Subtotal | $1,682,251 |

| | Non-Potable | QUANTITY | UNIT | PRICE | COST |
|---|---|---|---|---|---|
| 820 | 4" C-900 CL 150 | 6,020 | LF | $40.00 | $240,800 |
| 821 | 4" x 4" Tee Fitting | 7 | EA | $500.00 | $3,500 |
| 822 | 4" - 11 ¼° Bend w/ Kick Block | 34 | EA | $500.00 | $17,000 |
| 824 | 4" - 45° Bend w/ Kick Block | 14 | EA | $500.00 | $7,000 |
| 825 | 4" Cross Fitting | 3 | EA | $500.00 | $1,500 |
| 817 | 2" Blow off | 4 | EA | $2,000.00 | $8,000 |
| 827 | 4" Gate Valve | 22 | EA | $1,750.00 | $38,500 |
| | | | | Non Potable Subtotal | $316,300 |

| | |
|---|---|
| **Subtotal Cost** | **$3,609,815** |
| **15% Contigency** | **$541,472** |
| **Total Cost** | **$4,151,287** |

**Notes:**

1) This estimate is prepared based on the plans dated August 20, 2021, prepared by Redland.

2) Soft costs are not included.

Redland
WHERE GREAT PLACES BEGIN
720.283.6783 Office
1500 West Canal Court
Littleton, Colorado 80120
REDLAND.COM

# Murata Farms Filing No. 1

## Exhibit B - SIA Phase II Public Improvements

### Opinion of Probable Cost Estimate

Date: August 20, 2021

JN: 19.032

| | Mobilization | QUANTITY | UNIT | UNIT PRICE | TOTAL COST |
|---|---|---|---|---|---|
| 101 | Mobilization (grading, utilities, streets) | 1 | LS | $30,000.00 | $30,000 |
| | | | | Mobilization Subtotal | $30,000 |

| | Storm Sewer | QUANTITY | UNIT | UNIT PRICE | TOTAL COST |
|---|---|---|---|---|---|
| 401 | 18" RCP (0-8' depth) | 237 | LF | $55.00 | $13,035 |
| 402 | 24" RCP (0-8' depth) | 124 | LF | $75.00 | $9,300 |
| 403 | 30" RCP (0-8' depth) | 427 | LF | $90.00 | $38,430 |
| 404 | 36" RCP (0-8' depth) | 96 | LF | $125.00 | $12,000 |
| 405 | 42" RCP (0-8' depth) | 578 | LF | $150.00 | $86,700 |
| 406 | 48" RCP (0-8' depth) | 347 | LF | $160.00 | $55,520 |
| 434 | 54" RCP (0-8' depth) | 604 | LF | $180.00 | $108,720 |
| 409 | 4' Dia. Manhole | 1 | EA | $4,500.00 | $4,500 |
| 410 | 5' Dia. Manhole | 2 | EA | $6,000.00 | $12,000 |
| 411 | 6' Dia. Manhole | 2 | EA | $6,500.00 | $13,000 |
| 412 | Box Base Manhole | 11 | EA | $7,500.00 | $82,500 |
| 413 | 5' Type 'R' Inlet | 2 | EA | $6,000.00 | $12,000 |
| 414 | 10' Type 'R' Inlet | 6 | EA | $7,000.00 | $42,000 |
| 415 | 15' Type 'R' Inlet | 2 | EA | $8,500.00 | $17,000 |
| 425 | 36" Flared End Section | 1 | EA | $3,700.00 | $3,700 |
| | | | | Storm Sewer Subtotal | $510,405 |

Redland
WHERE GREAT PLACES BEGIN

# Murata Farms Filing No. 1

## Exhibit B - SIA Phase II Public Improvements

**Opinion of Probable Cost Estimate**

Date: August 20, 2021

JN: 19.032

| | Water | QUANTITY | UNIT | UNIT PRICE | TOTAL COST |
|---|---|---|---|---|---|
| 501 | Connect to Existing Main | 2 | EA | $2,500.00 | $5,000 |
| 504 | 8" C-900 CL 150 | 3,608 | LF | $42.00 | $151,536 |
| 505 | 12" C-900 CL 150 | 1,166 | LF | $60.00 | $69,960 |
| 503 | 6" CL-52 DIP | 147 | LF | $45.00 | $6,615 |
| 502 | Fire Hydrant Assembly | 11 | EA | $6,000.00 | $66,000 |
| 506 | 8" - 11 ¼° Bend w/ Kick Block | 9 | EA | $600.00 | $5,400 |
| 508 | 8" - 45° Bend w/ Kick Block | 5 | EA | $600.00 | $3,000 |
| 508A | 12" - 45° Bend w/ Kick Block | 2 | EA | $600.00 | $1,200 |
| 527 | 8" Plug w/ Kick Block | 1 | EA | $400.00 | $400 |
| 520 | 12" - 11 ¼° Bend w/ Kick Block | 2 | EA | $750.00 | $1,500 |
| 510 | 8" x 8" Tee Fitting | 5 | EA | $600.00 | $3,000 |
| 511 | 8" x 6" Tee Fitting | 8 | EA | $600.00 | $4,800 |
| 525 | 12" x 12" Tee Fitting | 3 | EA | $750.00 | $2,250 |
| 515 | 12" Gate Valve | 8 | EA | $2,750.00 | $22,000 |
| 522 | 8" x 6" Reducer | 1 | EA | $600.00 | $600 |
| 514 | 8" Gate Valve | 17 | EA | $2,000.00 | $34,000 |
| 524 | 12" x 6" Tee Fitting | 2 | EA | $750.00 | $1,500 |
| | | | | Water Subtotal | $378,761 |

| | Sanitary Sewer | QUANTITY | UNIT | UNIT PRICE | TOTAL COST |
|---|---|---|---|---|---|
| 601 | Connect to Existing Main | 1 | EA | $3,500.00 | $3,500 |
| 604 | 4' Dia. Manhole (0-12' Depth) | 32 | EA | $4,250.00 | $136,000 |
| 602 | 8" SDR-35 PVC (0-12' depth) | 2,770 | LF | $42.00 | $116,340 |
| 612 | 10" SDR-35 PVC (0-12' depth) | 2,075 | LF | $48.00 | $99,600 |
| | | | | Sanitary Sewer Subtotal | $355,440 |

Redland
WHERE GREAT PLACES BEGIN

# Murata Farms Filing No. 1

## Exhibit B - SIA Phase II Public Improvements

**Opinion of Probable Cost Estimate**

Date: August 20, 2021

JN: 19.032

| | Street Improvements | QUANTITY | UNIT | UNIT PRICE | TOTAL COST |
|---|---|---|---|---|---|
| 701 | Subgrade Prep | 22,820 | SY | $3.00 | $68,460 |
| 702 | Asphalt (Full depth - 6" section) | 77,400 | SY-IN | $4.25 | $328,950 |
| 702A | Asphalt (Full depth - 8" section) | 50,060 | SY-IN | $4.25 | $212,753 |
| 707 | Type 2 Curb and Gutter | 3,966 | LF | $22.00 | $87,252 |
| 708 | Type 1 Combination Curb, Gutter & 4' Sidewalk | 6,983 | LF | $40.00 | $279,320 |
| 709 | 8' Concrete Crosspan | 6 | EA | $2,000.00 | $12,000 |
| 710 | Subgrade Prep - Concrete Walk | 93,456 | SF | $1.75 | $163,548 |
| 711 | 5' Concrete Walk | 59,507 | SF | $5.50 | $327,289 |
| 712 | Handicap Ramp | 18 | EA | $1,900.00 | $34,200 |
| 713 | Mid-Block Ramp | 10 | EA | $1,500.00 | $15,000 |
| 715 | Signage | 25 | EA | $500.00 | $12,500 |
| 716 | Street Light (Local) | 15 | EA | $7,500.00 | $112,500 |
| 717 | Gravel Path | 6,014 | SF | $1.50 | $9,021 |
| | | | | Street Subtotal | $1,662,793 |

| | Non-Potable | QUANTITY | UNIT | PRICE | COST |
|---|---|---|---|---|---|
| 820 | 4" C-900 CL 150 | 4,955 | LF | $40.00 | $198,200 |
| 821 | 4" x 4" Tee Fitting | 7 | EA | $500.00 | $3,500 |
| 822 | 4" - 11 ¼° Bend w/ Kick Block | 10 | EA | $500.00 | $5,000 |
| 823 | 4" - 22 ½° Bend w/ Kick Block | 1 | EA | $500.00 | $500 |
| 824 | 4" - 45° Bend w/ Kick Block | 15 | EA | $500.00 | $7,500 |
| 825 | 4" Cross Fitting | 1 | EA | $500.00 | $500 |
| 826 | 12" x 4" Tee Fitting | 1 | EA | $950.00 | $950 |
| 815 | 12" Gate Valve | 1 | EA | $2,750.00 | $2,750 |
| 827 | 4" Gate Valve | 20 | EA | $500.00 | $10,000 |
| | | | | Non Potable Subtotal | $228,900 |

| | |
|---|---|
| **Subtotal Cost** | **$3,166,299** |
| **15% Contigency** | **$474,945** |
| **Total Cost** | **$3,641,244** |

**Notes:**

1) This estimate is prepared based on the plans dated August 20, 2021, prepared by Redland.

2) Soft costs are not included.

CITY OF
Fort Lupton
EST 1836

Public Works

130 S. McKinley Avenue
Fort Lupton, CO 80621
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**Exhibit "C" to Murata Farms SIA**

**Cost of Landscape, Park and Trail Improvements by Phase**

# Murata Farms

## Exhibit C

## Phase 1 Landscape Improvements Opinion of Cost

August 20, 2021

| Item | Qty | Unit | Unit cost | Cost Per Item |
|---|---|---|---|---|
| **RIGHT-OF-WAY TREE LAWN (NOT FRONTING HOMES)** | | | | |
| Turf Grass Sod with Soil Prep | 17,185 | sf | $0.48 | $8,248.80 |
| Irrigation * Does not include tap fees, Backflow | 17,185 | sf | $0.80 | $13,748.00 |
| Shade trees - 2.5" Cal B&B | 39 | ea | $500.00 | $19,500.00 |
| Ornamental Tree - 2" Cal B&B | 6 | ea | $400.00 | $2,400.00 |
| Entry Monument | 1 | ea | $30,000.00 | $30,000.00 |
| **Subtotal** | | | | **$73,896.80** |
| **PARKS** | | | | |
| Turf Grass Sod with Soil Prep | 30,071 | sf | $0.48 | $14,434.08 |
| Rock Mulch Bed with Soil Prep | 9,785 | sf | $0.68 | $6,653.80 |
| Irrigation * Does not include tap fees, Backflow | 39,856 | sf | $0.80 | $31,884.80 |
| Native Seed w/ Soil Prep | 16,433 | sf | $0.30 | $4,929.90 |
| Temporary Irrigation | 16,433 | sf | $0.68 | $11,174.44 |
| Shade trees - 2.5" Cal B&B | 14 | ea | $500.00 | $7,000.00 |
| Ornamental Tree - 2" Cal B&B | 18 | ea | $400.00 | $7,200.00 |
| Evergreen Tree - Avg. 6' Height | 23 | ea | $450.00 | $10,350.00 |
| Shrub - 5 Gallon | 342 | ea | $28.00 | $9,576.00 |
| Perennial / Ornamental Grass - 1 Gallon | 292 | ea | $16.00 | $4,672.00 |
| Landscape Edger | 590 | lf | $3.00 | $1,770.00 |
| Engineered Wood Fiber Play Surfacing | 2,290 | sf | $4.00 | $9,160.00 |
| Playground Drain System (Fibar or Equal) | 1 | ea | $1,200.00 | $1,200.00 |
| Playground Curb | 170 | lf | $24.00 | $4,080.00 |
| Play Structure | 1 | ea | $35,000.00 | $35,000.00 |
| Play Spring Rider | 2 | ea | $3,000.00 | $6,000.00 |
| Swing Set | 1 | ea | $3,500.00 | $3,500.00 |
| Shelter 20'x24' | 1 | ea | $36,000.00 | $36,000.00 |
| Charcoal Grill | 2 | ea | $530.00 | $1,060.00 |
| Bike Rack | 4 | ea | $680.00 | $2,720.00 |
| Picnic Table | 4 | ea | $2,600.00 | $10,400.00 |
| Bench | 4 | ea | $1,256.00 | $5,024.00 |
| Trash Receptacle | 2 | ea | $1,116.00 | $2,232.00 |
| Dog Bag Station | 4 | ea | $943.00 | $3,772.00 |
| **Subtotal** | | | | **$229,793.02** |
| **OPEN SPACE** | | | | |
| Turf Grass Sod with Soil Prep | 4,302 | sf | $0.48 | $2,064.96 |
| Rock Mulch Bed with Soil Prep | 20,263 | sf | $0.68 | $13,778.84 |
| Irrigation * Does not include tap fees, Backflow | 24,565 | sf | $0.80 | $19,652.00 |
| Native Seed w/ Soil Prep | 47,919 | sf | $0.30 | $14,375.70 |
| Temporary Irrigation | 47,919 | sf | $0.68 | $32,584.92 |
| Shade trees - 2.5" Cal B&B | 10 | ea | $500.00 | $5,000.00 |
| Ornamental Tree - 2" Cal B&B | 10 | ea | $400.00 | $4,000.00 |
| Evergreen Tree - Avg. 6' Height | 24 | ea | $450.00 | $10,800.00 |
| Shrub - 5 Gallon | 366 | ea | $28.00 | $10,248.00 |
| Perennial / Ornamental Grass - 1 Gallon | 243 | ea | $16.00 | $3,888.00 |
| Landscape Edger | 490 | lf | $3.00 | $1,470.00 |
| Bench | 3 | ea | $1,256.00 | $3,768.00 |
| Privacy Fence | 194 | lf | $45.00 | $8,730.00 |
| Open Rail Fence | 5,257 | lf | $30.00 | $157,710.00 |
| **Subtotal** | | | | **$288,070.42** |

| | |
|---|---|
| **TOTAL ALL LANDSCAPE** | **$591,760.24** |
| **10% Contingency** | **$59,176.02** |
| **Grand Total** | **$650,936.26** |

# Murata Farms

## Exhibit C

## Phase 2 Landscape Improvements Opinion of Cost

August 20, 2021

| Item | Qty | Unit | Unit cost | Cost Per Item |
|---|---|---|---|---|
| **RIGHT-OF-WAY TREE LAWN (NOT FRONTING HOMES)** | | | | |
| Turf Grass Sod with Soil Prep | 10,283 | sf | $0.48 | $4,935.84 |
| Rock Mulch Bed with Soil Prep | 7,802 | sf | $0.68 | $5,305.36 |
| Irrigation * Does not include tap fees, Backflow | 18,085 | sf | $0.80 | $14,468.00 |
| Shade trees - 2.5" Cal B&B | 34 | ea | $500.00 | $17,000.00 |
| Ornamental Tree - 2" Cal B&B | 5 | ea | $400.00 | $2,000.00 |
| Shrub - 5 Gallon | 224 | ea | $28.00 | $6,272.00 |
| Perennial / Ornamental Grass - 1 Gallon | 156 | ea | $16.00 | $2,496.00 |
| Landscape Edger | 88 | lf | $3.00 | $264.00 |
| **Subtotal** | | | | **$52,741.20** |
| **PARKS** | | | | |
| Turf Grass Sod with Soil Prep | 1,002 | sf | $0.48 | $480.96 |
| Rock Mulch Bed with Soil Prep | 4,210 | sf | $0.68 | $2,862.80 |
| Irrigation * Does not include tap fees, Backflow | 5,212 | sf | $0.80 | $4,169.60 |
| Ornamental Tree - 2" Cal B&B | 5 | ea | $400.00 | $2,000.00 |
| Evergreen Tree - Avg. 6' Height | 6 | ea | $450.00 | $2,700.00 |
| Shrub - 5 Gallon | 101 | ea | $28.00 | $2,828.00 |
| Perennial / Ornamental Grass - 1 Gallon | 185 | ea | $16.00 | $2,960.00 |
| Landscape Edger | 226 | lf | $3.00 | $678.00 |
| Bench | 2 | ea | $1,256.00 | $2,512.00 |
| Dog Bag Station | 1 | ea | $943.00 | $943.00 |
| **Subtotal** | | | | **$22,134.36** |
| **OPEN SPACE** | | | | |
| Turf Grass Sod with Soil Prep | 5,994 | sf | $0.48 | $2,877.12 |
| Rock Mulch Bed with Soil Prep | 24,984 | sf | $0.68 | $16,989.12 |
| Irrigation * Does not include tap fees, Backflow | 30,978 | sf | $0.80 | $24,782.40 |
| Native Seed w/ Soil Prep | 59,120 | sf | $0.30 | $17,736.00 |
| Temporary Irrigation | 59,120 | sf | $0.68 | $40,201.60 |
| Shade trees - 2.5" Cal B&B | 14 | ea | $500.00 | $7,000.00 |
| Ornamental Tree - 2" Cal B&B | 16 | ea | $400.00 | $6,400.00 |
| Evergreen Tree - Avg. 6' Height | 33 | ea | $450.00 | $14,850.00 |
| Shrub - 5 Gallon | 602 | ea | $28.00 | $16,856.00 |
| Perennial / Ornamental Grass - 1 Gallon | 424 | ea | $16.00 | $6,784.00 |
| Landscape Edger | 823 | lf | $3.00 | $2,469.00 |
| Bench | 1 | ea | $1,256.00 | $1,256.00 |
| Privacy Fence | 647 | lf | $45.00 | $29,115.00 |
| Open Rail Fence | 5,073 | lf | $30.00 | $152,190.00 |
| **Subtotal** | | | | **$339,506.24** |

| | |
|---|---|
| **TOTAL ALL LANDSCAPE** | **$414,381.80** |
| **10% Contingency** | **$41,438.18** |
| **Grand Total** | **$455,819.98** |

CITY OF
Fort Lupton
EST 1836

Public Works

130 S. McKinley Avenue
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**Exhibit "D" to Murata Farms SIA**

**Phasing Map**

# EXHIBIT D

PHASE LINE

HIGHWAY 52 IMPROVEMENTS IN PHASE 1

HIGHWAY 52 IMPROVEMENTS IN PHASE 1

COLORADO STATE HWY 52

TRAIL IN PHASE 2

TRAIL IN PHASE 2

UNPLATTED

ASSESSED OWNER:
PATRICIA L. TERRY TRUST
REC. NO. 4362422

FUTURE PHASE

END MEADOWLARK PARKWAY IN PHASE 1 AND STUB UTILITIES

FUTURE PHASE

FUTURE PHASE

LOT A
RECORDED EXEMPTION NO.
1471-04-3-RE 879
REC. NO. 02065102

ASSESSED OWNER:
PATRICIA L. TERRY TRUST
REC. NO. 4362422

ASSESSED OWNER:
APPEL FARMS HOA
REC. NO. 3922065

S. GERRY AVENUE

MEADOWLARK PARKWAY

MEADOWLARK PARKWAY

S. COLLEGE AVE.

PHASE 1

SAGE GROUSE AVE.

BLUEBIRD AVE.

MOUNTAIN FLOWER AVE.

END PHASE 1 SANITARY AT MANHOLE AND STUB TO THE EAST

LAKE SPARROW STREET

SILVERADO LANE

ROCK WREN STREET

ROCK WREN STREET

WOOD THRUSH AVE.

SILVERADO LANE

BARN OWL AVE.

PHASE 2

HUMMINGBIRD AVE.

MOURNING DOVE AVE.

LARK BUNTING STREET

S. COLLEGE AVE.

ASSESSED OWNER:
APPEL FARMS HOA
REC. NO. 3922065

ALL DETENTION POND IMPROVEMENTS IN PHASE 1

MOUNTAIN SKY FILING NO. 1

ALL DETENTION POND IMPROVEMENTS IN PHASE 1

MOUNTAIN SKY FILING NO. 1


Redland
WHERE GREAT PLACES BEGIN
720.283.6783 Office
1560 West Canal Court
Littleton, Colorado 80120
REDLAND.COM


| | |
|---|---|
| DATE | 8/20/21 |
| DRAWN | BRC |
| CHECKED | TJF |
| APPROVED | TJF |
| PROJECT NO. | 19032 |

PHASING PLAN

MURATA FARMS FILING NO. 1

EXHIBIT D

FT LUPTON CO

SHEET D

I:\2019\19032 - Murata Farms\CADD\Exhibits\SIA\SIA EXH.dwg tab: Phasing Plan Aug 20, 2021 - 3:44pm tfrazier

# CITY OF FORT LUPTON
# CITY COUNCIL

Zo Stieber, Mayor

Valerie Blackston, Ward 1
Chris Ceretto, Ward 2
Carlos Barron, Ward 3

David Crespin, Ward 1
Claud Hanes, Ward 2
Bruce Fitzgerald, Ward 3

**AM 2022-028**

**APPROVE PUBLIC WORKS WASTEWATER DISPOSAL AGREEMENT WITH BLACK DIAMOND PUMPING FOR DISPOSAL OF DOMESTIC WASTEWATER TO THE CITY SANITARY SEWER SYSTEM**

**I.** **Agenda Date:** Council Meeting – February 1, 2022

**II.** **Attachments:** PW Agreement - Black Diamond Pumping

**III.** **Summary Statement:**

To approve signing of Public Works agreement with Black Diamond Pumping for disposal of domestic septic wastewater to the City sanitary sewer system.

**IV.** **Submitted by:** _____
Public Works Director

**V.** **Finance Reviewed** _____
Finance Director

**VI.** **Approved for Presentation:** _____
City Administrator

**VII.** **Attorney Reviewed** Approved Pending Approval

**VIII.** **Certification of Council Approval:** _____ _____
City Clerk Date

**IX. Detail of Issue/Request:**

The City has entered into agreements for the disposal of wastewater to the City's sanitary sewer system by waste haulers in the past (CIVEO). The agreement provides for compliance with the Municipal Codes and Ordinances related to the City's sewer system (Chapter 13, Article I)

The agreement restricts type of waste allowed for disposal, provides a "virtual" sewer service connection and billing structure for the hauler.

Black Diamond Pumping is a local contractor located at 14037 CR 8. The Company's operation is septic tank maintenance.

Monthly billings will include the $16.60 monthly fee, $40.00 Reg 85 fee and $100.00 per load discharged. Company's ultimate use is anticipated to be 25 to 35 loads per month. The truck capacity is 3,000 gallons. The billing structure takes into account an average load of 2,000 gallons per trip. The company cost will average about $0.05 to $0.06 per gallon.

Black Diamond Pumping would like to start the agreement immediately.

**X. Legal/Political Considerations:**

Not Applicable.

**XI. Alternatives/Options:**

A) Approve the Discharge Permit.
B) Deny the Permit.
C) Modify the permit.

**XII. Financial Considerations:**

Monthly billings will range from $556.00 to $3,056.00 at full operations to the Utility Fund.

**XIII. Staff Recommendation:**

Staff recommends approving Wastewater Discharge Permit with Black Diamond Pumping.

CITY OF Fort Lupton EST 1836

# Public Works Agreement

# Water and Wastewater Services

This PUBLIC WORKS Agreement is entered into by and between the **City of Fort Lupton**, Colorado (hereinafter "City") and **Black Diamond Pumping** (hereinafter "PERMITTEE").

WHEREAS, the parties hereto agree in consideration of the covenants, payments and agreements set forth herein as follows:

1. **SCOPE OF SERVICES.** City will process waste water from collection services as outlined by Permittee.
   1.1. **Source of wastewater -** Domestic and Commercial septic systems
   1.2. **Quantity per dump cycle -** 2,000 gallons per truck load
   1.3. **Maximum dumps per month -** 35

**1. TERM OF AGREEMENT.**

The term of this Agreement shall begin on the Effective Date stated on the Public Works Permit and shall continue until terminated ("Termination Date") by either party. Permittee or City may terminate this Agreement at any time by giving at least a 45-day notice of the Termination Date to the City. From and after the Termination Date, the City will not be obligated to accept wastewater from Permittee. The City may terminate this Agreement for violation of this Agreement or the Wastewater Discharge Permit as provided in Paragraph 3.3 and 3.4. Upon termination for any reason, Permittee shall not be entitled to recover any payments from the City. Termination of this Agreement by the City is not considered to be the same as suspension of services as provided in Paragraphs 2.4.0, 3.3 and 3.4.

**2. WASTEWATER DISPOSAL**

**2.1. Incorporation of City Rules and of Discharge Permit; Exhibit A.**

All City ordinances, Rules and Regulations governing the acceptance and discharge of wastewater are hereby incorporated into this Agreement and any violation of the same shall be a violation of this Agreement. Attached hereto as **Exhibit A** is the Wastewater Discharge Permit, and as such, terms and conditions stated therein are expressly incorporated herein by reference.

**2.2. Entities Allowed to Discharge**

Discharges under this Agreement will only be accepted from Permittee hauling approved Wastewater and which is disposed of in accordance with this Agreement. It is the responsibility of Permittee to implement procedures assuring that the effluent discharged to the City system is Wastewater and the disposal is completed

in full compliance with this Agreement. Permittee assumes all liability for compliance with this Agreement.

**2.3. Discharge Site**

The Discharge Site is located on City property and is owned by the City. The current manhole location is set forth on Attachment A to Exhibit A, the wastewater discharge permit attached hereto and incorporated herein, which said location is subject to change. Use of the Discharge Site by Permittee will not be exclusive and may be used by the City and by other permittees of the City. Use of the Discharge Site by parties other than Customer shall not unreasonably interfere with Permittee's usage. The City will designate the exact point of the Discharge Site and access service road to the Discharge Site and shall be responsible for the maintenance and operation of the Discharge Site and service road, unless damage to either is caused by Permittee. All operation and maintenance shall be done in accordance with regulation issued by the City from time to time. Operation and maintenance of the Discharge Site and service road does not transfer to Permittee any ownership interests therein.

The City grants to Permittee this license to use the Disposal Site exclusively for the disposal of wastewater as restricted by this Agreement. Discharge into any other part of the City's system is expressly prohibited. In no event shall a discharge by Permittee cause the City to operate the Plant in excess of permitted treatment capacities or in violation of any federal, state or local laws, regulations, permits, rules, ordinances, or the exclusion of use by other customers of the City.

**2.4. Fees Paid to City.**

City will receive compensation from Permittee for Treatment Charges and all associated laboratory expenses.

2.4.1. **Monthly Service Charge.** The monthly service charge will consist of a monthly flat charge and Regulation 85 fee as may be adjusted from time to time by City Utility Enterprise Board. Current charges are $16.60 plus $40.00 Regulation 85 fee (for 2 SFE commercial use). Usage charge will be based on actual truck loads in each month. Truck capacity will be assessed at 5 cents per gallon assuming each truck is loaded at two thirds capacity (or 2,000 gallons average). Trucks permitted for this agreement are:

| Truck ID | Tank Capacity (gal) | Per Load Charge |
|---|---|---|
| CEO V85 | 3,000 | $100.00 |

The City will send a bill each month to Permittee reflecting the total truck loads for the prior month and the total monthly service charge. Payment is due by the 28th day of the month in which the bill is sent.

A delinquency charge consisting of an interest rate of 1.5% per month of the outstanding balance will be assessed against any amount not received by the City

on or before the due date. If a billing is more than thirty (30) days past due, the right to discharge effluent to the Discharge Site shall be suspended and no additional effluent shall be accepted until all charges are brought current. In addition, in order to reinstate service, the City may require a cash deposit or other satisfactory security deposit in an amount to be determined by the City but no less than an amount equal to 1.5 times the monthly billing average for the previous six (6) months.

The Monthly Service Charge is calculated based on a discharge with a BOD and TSS concentration of less than 325 mg/L. If testing shows the BOD and TSS to be in excess of the 325 mg/L, additional charges will be imposed by the City as set forth in the attached permit.

**2.4.2. Periodic Reports.** Permittee shall submit periodic reports as required by this Agreement. Periodic testing will be included in the monthly reports.

## 3. WASTEWATER CONSISTENCY AND PROHIBITED DISCHARGES

**3.1. Wastewater Consistency**. The provision of wastewater disposal services under this Agreement is premised upon the condition that Wastewater is generated by domestic only sources and has primary characteristics of residential wastewater with uniform organic loading. No significant change from the domestic only characteristics of the Wastewater is permitted, such as unusual changes in organic loading which may adversely impact the Plant or which results in the need for engineering studies, facility re-permitting, and construction of additional treatment or pre-treatment facilities or any other actions by the City without an amendment to this Agreement. In the event of a change in the character of Wastewater delivered to the Discharge Site, the City shall have the power to suspend services until such time as a resolution can be reached.

**3.2. Domestic septage waste** is defined as the liquid or solid material removed from a septic tank, cesspool, holding tank, or a similar system that receives only domestic waste (household, non-commercial, nonindustrial sewage). Non-domestic waste may include portable toilet waste, non-hazardous commercial wastes from the food processing industry, fats, oil and grease of animal or vegetable origin (e.g., from restaurants). Only the wastes described earlier in this paragraph constitute Routine Non-Hazardous Hauled Wastes; all other wastes are considered non-routine and are not covered under the scope of this permit application and/or the Permit.

**3.3. Prohibited Constituents.** The wastewater shall meet all limits or pollutant characteristics specified in the Wastewater Discharge Permit or as otherwise specified in the City's ordinances, Rules and Regulations, including the General and Specific Prohibitions and specific discharge limits specified in the Rules and Regulations.

**3.4. Routine Remedies.** Discharge of any pollutant or pollutant parameter that violates the Wastewater Discharge Permit or this Agreement may result in suspension of

service or termination of this Agreement or enforcement as outlined in the City's ordinances, Rules and Regulations.

**3.5. Emergency Remedies.** Where a discharge to the Plant reasonably appears to present an imminent endangerment to the health or welfare of persons, or presents or may present an endangerment to the environment, or threatens to interfere with the operation of the Plant, the City may, without notice, immediately take any steps necessary to halt or prevent the discharge, including suspension of services until the matters are corrected.

## 4. OWNERSHIP

Nothing in this Agreement shall create in Permittee any right of ownership in or to any of the City improvements, including the Plant and Discharge Site, the capacity thereof, the water utilized by the City attributable to water rights owned by the City in connection with return flows or otherwise, or any other property of the City.

## 5. LIABILITY AND DISPUTES.

**5.1. Compliance with Law.** The parties shall comply with all federal, state and local laws, ordinances, rules and regulations which are now, or in the future may become applicable to the parties, to their business or operations, and to services required to be provided under this Agreement.

**5.2. Liability.** The City shall not be liable for damages arising out of the interruption of operation of the Plant for any reason. The City, its elected officials, officers and employees are relying upon, and do not waive or intent to waive by any provision of this Agreement, the monetary limitations or any other rights, immunities and protections provided by the Colorado Governmental Immunity Act, C.R.S. Sec. 24-10-101 et seq. as amended or otherwise available to the City. Nothing herein shall operate as a waiver of any right the City has of governmental immunity under Colorado law which is specifically herein reserved.

## 6. LEGISLATIVE INDEPENDENCE AND PARTY AFFILIATION.

This Agreement shall not impair the legal authority of the elected officials of the City to exercise independent judgement with respect to any matter which may come before the City. This Agreement does not create a relationship of joint ventures, partners, or employer/employee between the parties. Neither party shall be liable for obligations incurred by the other and neither party shall have the power to charge to the credit of the other party any obligations incurred in performing this Agreement.

## 7. MISCELLANEOUS PROVISIONS.

**7.1. Effective Date.** Upon execution by both parties, this Agreement shall be in full force and effect and be legally binding upon each party. Each party agrees to execute, approve, and adopt any instruments, documents, and resolutions necessary to

effectuate the convents, terms, conditions, and provisions contained in this Agreement.

7.2. **Notices.** Billing and notices shall be sent to the business mailing address:
P.O. Box 622
Fort Lupton, CO 80621

**7.3. Amendment / No Assignment.** No modification or amendment of this Agreement shall be valid unless in writing and signed by all parties to this Agreement. Neither City nor Permittee shall assign or transfer interest in this Agreement without the written consent of the other.

7.4. **Insurance; Indemnification.**

7.4.1. **Workers' Compensation And Employer's Liability** - This insurance shall protect the Contractor against all claims under applicable state workers' compensation laws. The Contractor shall also be protected against claims for injury, disease, or death of employees which, for any reason, may not fall within the provisions of a workers' compensation law. This policy shall include an "all states" endorsement.

The liability limits shall be not less than:

| | |
|---|---|
| Workers' Compensation | Statutory |
| Employer's Liability | $ 100,000 Each Accident |
| | $ 500,000 Policy Limit |
| | $100,000 Each Employee |

7.4.2. **Comprehensive Automobile Liability -** - This insurance shall be written in comprehensive form and shall protect the contractor against all claims for injuries to members of the public and damage to property of others arising from the use of motor vehicles and shall cover operation on or off site of all motor vehicles licensed for highway use, whether they are owned, non-owned or hired.

The liability limits shall not be less than $150,000 each person and $600,000 each occurrence for Bodily Injury; $600,000 each occurrence for Property Damage; or a combined single limit of $600,000 each occurrence for Bodily Injury and Property Damage.

7.4.3. **Commercial General Liability** - This insurance shall be written in comprehensive form and shall protect the contractor against all claims arising from injuries to persons other than his employees or damage to property of Metro or others arising out of any act or omission of contractor or his agents, employees, or subcontractors. The policy shall also include protection against

claims insured by usual personal injury liability coverage, a "protective liability" endorsement to insure the contractual liability assumed by contractor under the indemnification provisions in General Conditions, and "Completed Operations and Products Liability" coverage (to remain in force during the correction period).

The liability limits shall not be less than $150,000 each person and $600,000 each occurrence for Bodily Injury and $600,000 each occurrence for Property Damage, with an annual aggregate of at least $1,000,000; or a Combined Single Limit of $600,000 each occurrence for Bodily Injury and Property Damage with an annual aggregate of at least $1,000,000.

7.4.4. **Indemnification** Permittee shall defend, indemnify and hold the City harmless from any damages caused by negligence, including but not limited loss, liability, expenses, suit or claim, or claim for injury to persons or damage to property arising out of the activities of Permittee pursuant to this Agreement. Expenses shall include all out of pocket expenses, attorney fees, expert costs and related litigation fees.

7.4.5. **Complete Agreement.** This Agreement, and the exhibits hereto, shall constitute the entire agreement between the parties with respect to the subject matter hereof and there are no agreements, representations or warranties other than as set forth herein.

7.4.6. **Governing Law.** This Agreement shall be governed by the laws of the State of Colorado. All parties agree that any dispute regarding enforcement of this Agreement shall be filed in Weld County District Court after first attempting in good faith to submit the dispute to mediation. Submission of any dispute to mediation shall be a condition precedent to filing litigation in this matter, other than the request for injunctive relief.

## 6. COVENANTS, MAINTENANCE AND FACILITIES

City is relying on statements from Permittee regarding source, quantity, operations and schedules. Monthly fee structure shall be reevaluated in the event changes in operations become apparent.

City shall provide a designated receiving manhole at the North Lift Station located in Factory Circle.

Permittee will comply with all regulations imposed by the City in reference to compliance levels approved by the State of Colorado. All waste water delivered to the designated receiving manhole shall comply with current ***Municipal Code Section 13-20. - Use of Public Sewers***.

Permittee shall discharge only allowable liquid waste water in a controlled manner to the designated manhole. Any spilled material on the street surface shall be cleaned up immediately. The manhole cover shall be replaced following discharge to the manhole each delivery cycle.

15. **SEVERABILITY.** In the event any portion of this Agreement is held to be unenforceable, the unenforceable portion of this Agreement will be deleted and the remaining provisions of the Agreement shall continue in full force and effect.

16. **OSHA REQUIREMENTS.** Permittee agrees that it alone bears the responsibility for providing a safe and healthy work environment and shall provide its employees with adequate orientation and training to safely perform the scope of work set forth in this contract. Permittee shall at all times comply with the safety and health regulations of the Occupational Safety and Health Act of 1970 (29 CFR 1926) including all amendments and modifications thereto. In the event there is a conflict between the safety and health provisions of federal, state or local regulations, the more stringent provision shall prevail. Permittee acknowledges and agrees that with respect to the scope of work under this contract, it shall comply with all obligations and assume all responsibilities for it's

17. **FORCE MAJEURE.** Neither party shall be liable or responsible to the other party nor be deemed to have defaulted under or breached this Agreement for failure or delay in fulfilling or performing any obligation under this Agreement when such failure or delay is caused by or results from causes beyond the reasonable control of the affected party, including but not limited to fire, floods, embargoes, pandemics, wars, acts of war (whether war is declared or not), insurrections, riots, civil commotions, strikes, lockouts or other labor disturbances, instances affecting public health including pandemics, acts of God or acts, omission, or delays in acting by any governmental authority. Provided, however, that the party so affected shall use reasonable efforts to avoid or remove such causes of non-performance, and shall continue performance hereunder with reasonable dispatch whenever such causes are removed. Either party shall provide the other party with prompt written notice of any delay or failure to perform that occurs by reason of force majeure. The parties shall mutually seek a resolution of the delay or the failure to perform as noted above.

18. **APPROVAL REQUIRED.** This Agreement is subject to the final approval of the Fort Lupton City Council and signature by the Mayor of Fort Lupton.

EXECUTED THIS _____ DAY OF **FEBRUARY, 2022**.

| **CITY OF FORT LUPTON, COLORADO** | **BLACK DIAMOND PUMPING:** |
|---|---|
| _____ | _____ |
| Zo Stieber<br>Mayor<br>130 S. McKinley Avenue<br>Fort Lupton, CO 80621 | BY:_____<br>TITLE:_____<br>14037 County Road 8<br>Fort Lupton, CO 80621 |

# Wastewater Discharge Permit

**In compliance with the provisions of the Rules and Regulations of the City of Fort Lupton, CO, herein referred to as the City,**

**Black Diamond Pumping**

**(herein referred to as the "Permittee") whose facility is located at14037 County Road 8, Fort Lupton, CO 80621 with a mailing address of P.O. Box 622, Fort Lupton, CO 80621,**

Is authorized to discharge to the sanitary sewer system in accordance with the effluent limitations, monitoring requirements and other conditions as set forth herein and in the Waste Hauler Agreement No. **2022-01**.

| Truck ID | Tank Capacity (gal) | Per Load Charge |
|---|---|---|
| CEO V85 | 3,000 | $100.00 |

The permit shall become effective on Month, #,2022. This permit shall expire at midnight Month #, 2021. If the permittee desires to discharge after the expiration date, the Permittee shall request a permit application form from the City within 90 days of expiration of this permit. The application shall be submitted to the City within 30 days of receipt of the permit application form by the Permittee. This permit is not transferable.

All reports and notifications required by this permit and City's Rules and Regulation shall be made to the address and telephone number below:

City of Fort Lupton
130 S McKinley Avenue
Fort Lupton, CO 80621
303-857-6694

**Signed this _____ day of Month, 2022.**

_____
Roy L. Vestal
Public Works Director

Receipt of this Wastewater Discharge Permit is hereby acknowledged by:

_____ _____
Authorized Representative of the Permittee Date

## I. OUTFALL AND WASTE DESCRIPTION

| *Outfall* | *Description and Location* |
|---|---|
| 01 | The Discharge shall be made at the City's North Lift Station on 1240 Factory Circle, Fort Lupton, CO. These discharges may be made during standard business hours 7 AM to 5 PM Monday through Friday as shown in Attachment A. |

Waste Description: The Permittee is authorized to discharge wastewater that is solely domestic waste. The domestic waste is residential and commercial septic systems. The wastewater is generated through the use of showers, sinks, toilets and washing machines. It is collected on sites from septic tanks that are pumped by the Permittee and brought to the discharge location.

At no time shall any waste from the production processes for gasoline or oil and in particular, but not limited to, the process known as Hydraulic Fracturing, being introduced to the wastewater treatment plant.

## II. EFFLUENT MONITORING AND LIMITATIONS

### a. Dilution Prohibition

The Permittee shall not increase the use of clean water or process water or, in anyway, attempt to dilute a discharge as a partial or complete substitute for adequate treatment to achieve compliance with any applicable limitation, standard or requirement.

### b. Specific Effluent Limitations

**i.** The Permittee shall not discharge wastewater containing any of the materials and substances in excess of the concentration listed in **Section 13-20(c)(20) of Article I, Chapter 13 City of Fort Lupton Municipal Code (attachment B)**

### c. Specific Storm Sewer Discharge Prohibitions

Effective immediately, the Permittee shall not discharge or cause to be discharged to a storm drainage facility any material that is not entirely composed of storm water. The discharge of process and domestic wastewaters to the storm sewer is prohibited.

## III. SELF-MONITORING

### a. Sampling and Analyses

In the event of an irregular pumping operation that causes any doubt that the discharge is anything other than domestic wastewater, the permittee is required to perform collection and to have the analyses of wastewater samples analyzed through a state of Colorado certified laboratory. Samples or measurements shall be representative of the discharge during the sampling

period, representative of normal operating conditions and shall be taken as required.

Sampling and testing shall occur at least once per 6 deliveries to the North Lift Station. All sampling to be done by the contractor, in accordance with established protocols and documented on the load ticket as having been done.

Additional Monitoring to be reported: Results of all additional samples if analyzed by test procedures approved under 40 CFR Part 136, must be submitted as part of the required reports during the reporting period.

Equipment or instrumentation used for self-monitoring must be maintained in good working order and calibrated according to the manufacturer's specifications. Maintenance and calibration records must be kept on site and available for inspection.

**b. Violation of Pollutant Limits**

A violation of any pollutant limit must be reported to the City within twenty-four (24) hours of:

1. The Permittee's receipt of analytical data from an outside lab: or
2. The result being available to the Permittee when the analysis is performed in-house.

If any sample shows a violation, the permittee shall collect additional samples and analyze for the pollutant parameter(s) that showed the violation. The permittee shall continue this resampling effort on 10 consecutive truck loads delivered for disposal. The sample result shall be submitted to the City within thirty (30) days of becoming aware of the violation.

The permittee shall report all instances of a truck load being rejected or turned away. A report of the reason(s) for rejection shall be submitted with the required report for that month.

These reporting and resampling requirements are not required for samples and measurements taken by the City in accordance with Section II.B.6. of this Permit.

**c. Test Procedures and Monitoring Requirements**

All pollutant analysis, including sampling techniques, to be submitted as part of a wastewater discharge permit application, report, permit or other analysis required under this shall be performed in accordance with the techniques prescribed in **40 CFR Part 136** and amendments thereto, unless otherwise specified in an applicable categorical Pretreament Standard.

## IV. REPORTING REQUIREMENTS

### a. Periodic Compliance Reporting

Except for samples and measurements covered by Section II.B.6. of this Permit, compliance reports containing the following information shall be submitted **Monthly**. The reports are due on or before the 28th of the month following the sampling period. The report must be received by the City at the address designated on Page 1 of this Permit. Monthly report shall be submitted at the end of each month.

Reports shall include:

1. Concentrations and measurements of all parameters for which there are self-monitoring requirements. Legible copies of completed chain-of-custody (COC) forms and laboratory analytical reports for each sample shall be included.
2. A copy of all logs required for that month, including total volume accepted, results of all pH measurements, and the logs for the required visual observations. pH meters shall be calibrated and maintained to ensure that the accuracy of the measurements are consistent with the accepted acceptability of that type of device.
3. Copies of any spills shall be maintained and reported. Information shall include the date, time, and estimated volume. The permittee shall also describe how the remediated spill was remediated and is required to complete all state required spill reporting and documentation under (25-18-10 (19) C.R.S).
4. The following certification statement:

   *"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belier, true, accurate, and completer. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."*
5. If no discharge occurs during the reporting period, "*No Discharge*" shall be reported.

## V. STANDARD CONDITIONS

### a. General and Specific Discharge Prohibitions

The Permittee shall not introduce pollutants into the City's POTW which may cause Pass Through or Interference or cause violations of the City's wastewater treatment plant NPDES permit as specified in chapter 13 of the Municipal Code.

**b. Changes in Operation**

The Permittee shall file a notification to the City a minimum of fourteen (14) days prior to any planned significant change in operation or wastewater characteristics. A significant change shall be a change to, but is not limited to the following:

1. Change in number or type of trucks delivering waste.
2. Any change in the type of waste. The current permit is written to limit the type of waste discharged to the City is solely domestic waste from typical residential type sources.

**c. Reports of Potential Problems**

i. In the case of any discharge, including, but not limited to , accidental discharges, discharges of a nonroutine, episodic nature, a noncustomary batch discharge, a Slug Discharge or Slug Load, that might cause potential problems for the POTW, the Permittee shall **immediately** telephone 720-466-6182 and notify the Wastewater Plant Manager of the incident. This notification shall include:
   1. Name of the caller
   2. Date and time of discharge
   3. Date and time discharge was halted
   4. Estimated volume of discharge
   5. Estimated concentration of discharge for any pollutant that may cause a problem
   6. Corrective actions taken to halt the discharge
   7. Method of alternative disposal if applicable

ii. Within five (5) working days following such discharge, the Permittee shall submit a written report describing the cause(s) of the discharge and the measures to be taken by the Permittee to prevent similar future occurrences. Such notification shall not relieve the Permittee of any expense, loss, damage, or other liability which might be incurred as a result of damage to the POTW, natural resources, or any other damage to person or property; nor shall such notification relieve the Permittee of any fines, penalties, or other liability which may be imposed pursuant to the City's Rules and Regulation.

**d. Accidental Discharge/Slug Discharge Control Plans**

i. The Permittee shall provide protection from accidental discharge or slug loads of pollutants regulated under this permit. The Permittee shall submit a Standard Operation Procedure (SOP) for addressing any spills during waste acceptance and disposal and submit to the City prior

to acceptance of any waste. The Permittee shall keep this SOP up-to-date and submit any modification to the City.

ii. Notice to employees. The Permittee shall train all employees, contractors or others that oversee discharge on proper practices. The Permittee shall keep documentation of this training (date, time, subject matter and employee (contractor) name.

e. **Pretreatment Facilities Requirement**

Pretreatment Facilities: If the City determines that additional pretreatment is necessary including flow equalization, the Permittee shall provide wastewater treatment as necessary to comply with this Permit and shall achieve compliance with all Pretreatment Standards and Requirements.

Additional Pretreatment Measures: Whenever deemed necessary, the City may require the Permittee to restrict their discharge, relocate and/or consolidate points of discharge, and such other conditions as may be necessary to protect the POTW and demonstrate the Permittee's compliance with the requirements of the Permit.

**f. Permit Noncompliance**

The Permittee must comply with all conditions of this Permit. Any permit noncompliance constitutes a violation of the City's agreement with the Permittee. Such a violation may result in the immediate suspension and/or revocation of this Permit and an enforcement action, including the imposition of penalties to include a fine of $1,000 per incident in accordance with Municipal Code Article IV, Section 1-72 and the Permittee will be responsible for any cleanup or additional treatment costs necessary to correct problems caused due to the discharge as well as reimbursement to the City for any fines levied on the City for non-compliance with state stature and damage to equipment In Accordance with Municipal Code Article IV, Section 1-74. Additional Criminal penalties may be imposed if deemed appropriate. If the Permittee is in Significant Noncompliance with applicable Pretreatment Standards and Requirements, the City shall publish the Permittee and facts surrounding the SNC in the Local Fort Lupton, CO newspapers.

Violations that include the introduction of any non-domestic wastes into the wastewater plant will be grounds for immediate termination of this agreement and will incur all fines and penalties listed above.

**Specifically introduction of any quantity of Arsenic (as), Cadmium (Cd), Chromium (Cr)(4), Chromium (VI)(4), Copper (Cu), Lead (Pb), Mercury (Hg), Molybdenum (Mo), Nickel (Ni), Selenium (Se), Silver (Ag), Zinc (Zn), Benzene, or BTEX(3), also listed above in section II-B, will cause a permit violation for the City's wastewater treatment plant and are expressly forbidden by this agreement. Any introduction of these**

**compounds would be grounds for immediate termination of this agreement.**

Violations of BOD and/or TSS standards would incur the following penalties

- BOD or TSS between 325 and 500 mg/l will incur an increase from 0.20 cents per gallon to 0.30 cents per gallon
- BOD or TSS between 501 and 1000 mg/l will incur an increase form 0.20 cents per gallon to 0.50 cents per gallon
- BOD or TSS above 1001 mg/l will incur an immediate fine of $1,000 in addition to the 0.50 cent per gallon charge and could potentially cause a revocation of the Permittee's discharge permit.

**g. Federal and/or State Laws**

Nothing in this permit shall be construed so to preclude the institution of any legal action or relieve the Permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable federal and/or stat law or regulation.

**h. Records Management**

The Permittee shall retain, and make available for inspection and copying, all records of information obtained pursuant to any monitoring activities required by this Permit, any additional records of information obtained pursuant to monitoring activities undertaken by the Permittee independent of such requirements, and documentation associated with Best Management Practices. These records shall remain available for a period of three (3) years. This period shall be automatically extended for the duration of any litigation concerning the Permittee or the Mayor, or where the Permittee has been specifically notified of a longer retention period by the Mayor.

**i. Duty to Provide Information**

The Permittee shall furnish to the Mayor or his duly authorized representative, within a reasonable time, any information which the Mayor or his duly authorize representative may require, to determine whether cause exists for modifying, revoking and reissuing, terminating this permit or to determine compliance with the permit. The Permittee shall also furnish, upon request, copies of records required to be kept by this permit.

**j. Right of Entry**

Whenever it shall be necessary for the purposes of this Permit and the City's Rules and Regulations, the City Administrator or his designated representative may at any time and without notice, take samples, observe the Permittee, review logs, inspect all facilities and equipment used by the Permittee, take photographs or copy any records kept by the Permittee related to the activities covered by this Permit.

**k. Permit Modification and Revocation**

**i.** Permit modification: The City Administrator may modify wastewater discharge permit under Section 13 of the Municipal Code.

ii. Permit revocation: The City Administrator may revoke the wastewater discharge under section 13 of the Municipal Code.

**l. Property Rights**

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state or municipal laws and regulations.

**m. Severability**

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstances, is held invalid, the application of such provisions to other circumstances and the remainder of the permit shall not be affected thereby.

**n. Confidentiality**

All records, reports, data or other information supplied by the Permittee as a result of any disclosure required by these Regulations or information and data from inspections shall be available for public inspection.

Effluent data from any User whether obtained by self-monitoring, monitoring by the City or monitoring by any state or federal agency, shall not be considered a trade secret or otherwise confidential. All such effluent data shall be available for public inspection.

# EXHIBIT "A"

## Discharge Point

**Location at North Lift Station -**

Manhole
Discharge
Point

Discharge
Point

# EXHIBIT "A"

## Trucked and Hauled Waste Manifest

### Trucked and Hauled Waste Manifest

Instructions: Please print legibly. Complete all blanks in Parts I. Enter all information for each generator where waste was picked-up in Part II. Sign and date the manifest in Part III. Approval will be required prior to discharging any wastes that are not strictly domestic septage wastes.

| | |
|---|---|
| Part I<br>Transporter/Permittee:_____<br>Driver Name:_____<br>Truck License #: _____<br>Date of Disposal: _____ | |
| Part II – Waste Generator #1<br>Name: _____<br>Address: _____<br>Date Pumped: _____ Time Pumped _____ am/pm<br>Size of Tank: _____gal Amount Pumped: _____ gal<br>Description of Waste: _____ | Check One<br>__Domestic only<br>__ Grease Interceptor (Food Based)<br>__ Sand Trap<br>__ Industrial<br>__ Storm Water<br>__ Other |
| Part II – Waste Generator #2<br>Name: _____<br>Address: _____<br>Date Pumped: _____ Time Pumped _____ am/pm<br>Size of Tank: _____gal Amount Pumped: _____ gal<br>Description of Waste: _____ | Check One<br>__Domestic only<br>__ Grease Interceptor (Food Based)<br>__ Sand Trap<br>__ Industrial<br>__ Storm Water<br>__ Other |
| Part II – Waste Generator #3<br>Name: _____<br>Address: _____<br>Date Pumped: _____ Time Pumped _____ am/pm<br>Size of Tank: _____gal Amount Pumped: _____ gal<br>Description of Waste: _____ | Check One<br>__Domestic only<br>__ Grease Interceptor (Food Based)<br>__ Sand Trap<br>__ Industrial<br>__ Storm Water<br>__ Other |
| Part III:<br>I certify under penalty of law that this manifest was prepared by me or under my direction or supervision. The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I further certify that the wastes covered by this manifest are not hazardous as defined in 40 CFR Part 261. I further certify that all discharges made to the POTW are being made in accordance and in compliance with requirements specified in the applicable ordinance or rules and any issued permit, order, statement of requirements or other authorization to discharge. | |
| _____ Printed Name<br>_____ Signature of Transporter<br>_____ Date | |

# EXHIBIT

# Fort Lupton Municipal Code - Chapter 13

**ARTICLE I - Sewer System**

**Sec. 13-1. - Definitions.**

For purposes of this Article, the following words shall have the meanings ascribed hereafter:

***Biochemical oxygen demand (BOD)*** shall mean the quantity of oxygen utilized in the biochemical oxidation of organic matter under standard laboratory procedure in five (5) days at twenty degrees (20°) Centigrade, expressed in milligrams per liter.

***Building drain*** shall mean that part of the lowest horizontal piping of a draining system which receives the discharge from soil, waste and other drainage pipes inside the walls of the building and conveys it to the building sewer, beginning five (5) feet (1.5 meters) outside the inner face of the building wall.

***Building sewer*** shall mean the extension from the building drain to the public sewer or other place of disposal, also called house connection.

***Combined sewer*** shall mean a sewer intended to receive both wastewater and storm or surface water (not permitted).

***Easement*** shall mean an acquired legal right for the specific use of land owned by others.

***Floatable oil*** is oil, fat or grease in a physical state such that it will separate by gravity from wastewater by treatment in an approved pretreatment facility. Wastewater shall be considered free of floatable fat if it is properly pretreated and the wastewater does not interfere with the collection system.

***Garbage*** shall mean the animal and vegetable wastes resulting from the handling, preparation, cooking and serving of foods.

***Industrial wastes*** shall mean the wastewater from industrial processes, trade or business as distinct from domestic or sanitary wastes.

***May*** is permissive - see shall, below.

***Natural outlet*** shall mean any outlet, including storm sewers and combined sewer overflows, into a watercourse, pond, ditch, lake or other body of surface or groundwater.

***pH*** shall mean the logarithm of the reciprocal of the hydrogen-ion concentration. The concentration is the weight of hydrogen ions, in grams, per liter of solution. Neutral water, for example, has a pH value of 7 and a hydrogen-ion concentration of the log (1/H +).

***Properly shredded garbage*** shall mean the wastes from the preparation, cooking and dispensing of food that have been shredded to such a degree that all particles will be carried freely under the flow conditions normally prevailing in public sewers, with no particle greater than one-half (½) inch (1.27 centimeters) in any dimension.

***Public sewer*** shall mean a common sewer controlled by a governmental agency or public utility.

***Sanitary sewer*** shall mean a sewer that carries liquid and water-carried wastes from residences, commercial buildings, industrial plants and institutions together with minor quantities of ground, storm and surface waters that are not admitted intentionally.

***Sewage*** is the spent water of a community. The preferred term is wastewater, defined in below.

***Sewer*** shall mean a pipe or conduit that carries wastewater or drainage water.

***Sewer plant*** investment fee shall mean a fee charged for the privilege of connecting into the City's sewer system.

***Sewer tap*** means an opening or connection in the mains through which wastewater is discharged.

***Shall*** is mandatory - see may, above.

***Slug*** shall mean any discharge of water or wastewater which, in concentration of any given constituent or in quantity of flow, exceeds for any period of duration longer than fifteen (15) minutes more than five (5) times the average twenty-four-hour concentration, or flows during normal operation, and shall adversely affect the collection system and/or performance of the wastewater treatment works.

***Storm drain*** (sometimes termed storm sewer) shall mean a drain or sewer for conveying water, groundwater, subsurface water or unpolluted water from any source.

***Suspended solids*** shall mean total suspended matter that either floats on the surface of or is in suspension in water, wastewater or other liquids and that is removable by laboratory filtering as prescribed in "Standard Methods for the Examination of Water and Wastewater" and referred to as nonfilterable residue.

***Unpolluted water*** is water of quality equal to or better than the effluent criteria in effect or water that would not cause violation of receiving water quality standards and would not be benefited by discharge to the sanitary sewers and wastewater treatment facilities provided.

***Wastewater*** shall mean the spent water of a community. From the stand-point of source, it may be a combination of the liquid and water-carried wastes from residences, commercial buildings, industrial plants and institutions, together with any groundwater, surface water and stormwater that may be present.

***Wastewater facilities*** shall mean the structure, equipment and processes required to collect, carry away and treat domestic and industrial wastes and dispose of the effluent.

***Wastewater treatment works*** shall mean an arrangement of devices and structures for treating wastewater, industrial wastes and sludge. Sometimes used as synonymous with waste treatment plant or sewer treatment plant or wastewater treatment plant or water pollution control plant.

***Water requirements*** means Colorado Big Thompson (CBT) or Windy Gap water shares, or cash-in-lieu of such water shares, required to be conveyed or paid to the City at the time of the development of land. (See Sec. 13-122.)

***Watercourse*** shall mean a natural or artificial channel for the passage of water either continuously or intermittently.

*Prior code 12-530-4; Ord. 645 §1, 1993; Ord. 96-698 §1; Ord. 99-739)*

**Sec. 13-2. - Management of sewer system and wastewater treatment facilities.**

The Operations Director is the manager of the sewer system and wastewater treatment facilities for the purpose of management, maintenance, care and operation of the sewer system and wastewater treatment plant.

*(Prior code 12-530-1; Ord. 96-698 §1)*

**Sec 13-3. - Powers of Operations Director; City Administrator.**

The Operations Director shall have the immediate control and management of all things pertaining to City sewer system and wastewater treatment facilities, and the Operations Director shall perform all acts necessary for the prudent, efficient and economical management and protection of said sewer system and wastewater treatment facilities. The Fort Lupton Utility Enterprise Board shall have the power, by written resolution, to prescribe such other and further rules and rates as it may deem necessary. Technical services of a qualified engineer may be used in all cases wherein the Operations Director does not have the requisite engineering knowledge and experience to make decisions requiring such technical services. The City Administrator is authorized to promulgate regulations, guidelines and procedures adopted by the Fort Lupton Utility Enterprise Board, consistent with this Code, as are reasonably necessary and appropriate to implement the rules and policies of the Board.

*(Prior code 12-530-2; Ord. 96-698 §1; Ord. 99-739)*

**Sec. 13-4. - Receipts and deposits.**

The Finance Director shall keep a correct account of all receipts and materials furnished to consumers and shall collect the same and deposit the proceeds so collected to the credit of the Utility Enterprise Fund in accordance with the direction of the Fort Lupton Utility Enterprise Board.

*(Prior code 12-530-3; Ord. 96-698 §1; Ord. 99-739)*

**Sec. 13-5. - Composition of sewer utility.**

All sewer mains and collection lines, sewer lift stations, wastewater treatment plant and appurtenances thereto, machinery, equipment and supplies used by the City to supply its sewer users with service shall be known as the sewer system and wastewater treatment facilities; provided, however, that the sewer service line from the sewer main including the sewer tap saddle or wye, to the structure or property served shall be regarded as the property of the owner of said structure or property served.

*(Prior code 12-530-7; Ord. 96-698 §1; Ord. 2015-994 §45)*

**Sec. 13-6. - Damage to sewer system and wastewater treatment facilities property prohibited.**

It shall be unlawful for any person to in any way damage property, equipment or appliances constituting a part of the sewer system and wastewater treatment facilities. It shall be unlawful for any person to cast, place, dump or deposit any substance or material into the sewer system or wastewater treatment facilities which will in any manner injure or obstruct the system or facilities or pollute or contaminate the water.

*(Prior code 12-530-8; Ord. 96-698 §1)*

**Sec. 13-7. - Change of sewer use.**

It shall be unlawful for any person to alter, change, enlarge or extend in any manner whatsoever the type of use for which the sewer system was approved by the Operations Director, except as provided herein.

*(Prior code 12-530-10; Ord. 96-698)*

**Sec. 13-8. - Inspections; repairs.**

Whenever the Operations Director deems it necessary, the Operations Director may inspect the condition of all pipes and sewer fixtures or the manner in which the sewer is used. The Operations Director shall have the authority to make, or cause to be made, any repairs or alterations to sewer user's service as the Operations Director deems reasonably necessary. The Operations Director shall be vigilant to protect and remedy all abuses or other improper use of sewer.

*(Prior code 12-530-6; Ord. 96-698 §1)*

**Sec. 13-9. - Safety and access.**

(a)While performing the necessary work on private properties referred to in Section 13-8 above, the Operations Director or duly authorized employees of the City shall observe all reasonable safety rules applicable to the premises established by the owner or occupant of the premises. The owner and occupant shall be held harmless for injury or death to the City employees, and the City shall indemnify the owner and occupant of the premises against loss or damage to its property by City employees and against liability claims and demands for personal injury or property damage asserted against the owner and occupant of the premises growing out of the gauging and sampling operation, except as such may be caused by negligence or failure of the owner and occupant of the premises to maintain safe conditions as required.(b)The Operations Director and other duly authorized employees of the City bearing proper credentials and identification shall be permitted to enter all private properties through which the City holds a duly negotiated easement for the purposes of, but not limited to, inspection, observation, measurement, sampling, repair and maintenance of any portion of the wastewater facilities lying within said easement. All entry and subsequent work, if any, on said easement shall be done in full accordance with the terms of the duly negotiated easement pertaining to the private property involved.

*(Prior code 12-530-25; Ord. 96-698 §1)*

**Sec. 13-10. - Interference with sewer facilities prohibited.**

(a)It shall be unlawful for any person to trespass upon the property of the City, to tap any sewer mains or to make any connections therewith, without first having obtained a permit to do so.(b)It shall be unlawful to in any manner interfere with the City or the property, equipment, pipes, valves or any other appliances of the City, or to change or alter the position of any valve or appliance regarding the flow of sewer in any pipeline.

*(Prior code 12-530-9)*

**Sec. 13-11. - Authority during emergency situations.**

In the event of an emergency that should require the immediate curtailment of sewer service, the City Administrator shall have the authority to make such restrictions as deemed necessary for the protection of the public.

*(Prior code 12-530-21)*

**Sec. 13-12. - Connections to sewer lines and mains.**

It shall be unlawful for any person to make any connections with any sewer pipeline main which forms a part of the sewer system and wastewater treatment facilities except pursuant to and in accordance with the permit required by this Article. It shall be unlawful to make any connections with any privately owned sewer mains or pipelines which are connected with the sewer utility or to change, alter or renew any presently existing private main or pipeline connected with the sewer utility with any pipe larger than that in use.

*(Prior code 12-530-11; Ord. 96-698 §1)*

**Sec. 13-13. - General regulations for sewer service lines.**

(a) It shall be unlawful for any person other than a licensed plumber or the City's authorized representative to install a sewer line from the main to the building or connection. All service lines shall be of material and size as specified in the current City's specifications.

(b) The service line from the sewer main, including tap, to the structure served shall be installed, maintained and repaired by the sewer user at his or her expense. No claim shall be made against the City on account of breaking or for failure of the service of sewer, and no reduction in the rates will be made for any time that service pipes or fixtures are frozen or are not in proper working order. All connections, taps and lines that are or will become the responsibility of the City for maintenance shall be inspected by the City's authorized representative prior to being backfilled and used.

(c) The City shall be responsible for all maintenance and repairs to the sewer mains.

(d) Cross-connections with any water supply is strictly prohibited.

(e) The sewer service line from the main to the sewer collection system of the building to be served with sewer shall be of sufficient size to furnish an adequate flow to meet the requirements of the building and premises at peak demand and in no case shall be less than four (4) inches in diameter.

(f) It shall be unlawful for any person to place, deposit or permit to be deposited in any unsanitary manner on public or private property within the City, or in any area under the jurisdiction of said City, any human or animal excrement, garbage or other objectionable waste.

(g) It shall be unlawful to discharge to any natural outlet within the City, or in any area under the jurisdiction of said City, any sewage or other polluted waters, except where suitable treatment has been provided in accordance with subsequent provisions of this Article.

(h) Except as hereinafter provided, it shall be unlawful to construct or maintain any privy, privy vault, septic tank, cesspool or other facility intended or used for the disposal of wastewater.

(i) The owner of every house, building or property used for human occupancy, employment, recreation or other purposes, situated within the City and abutting on any other street, alley or right-of-way in which there is now located or may in the future be located a public sanitary sewer of the City, is hereby required at the owner's expense to install suitable toilet facilities therein and to connect such facilities directly with the proper public sewer in accordance with the provisions of this Article, within one hundred twenty (120) days after date of official notice to do so, provided that said public sewer is within four hundred (400) feet of the property line.

(j) New services to replace existing services shall not be approved by the City until the old service lines are completely disconnected from the main.

*(Prior code 12-530-16; Ord. 2015-992 §3; Ord. 2015-994 §46)*

**Sec. 13-14. - Installation of lines.**

All lines shall be installed in accordance with the current City specifications in effect at the time of installation.

*(Prior code 12-530-17; Ord. 2015-994 §47)*

**Sec. 13-15. - Excavation and backfilling.**

All excavation and backfilling in the street or alley shall be in conformity with current City specifications in effect at the time of work being done.

*(Prior code 12-530-18; Ord. 2015-994 §48)*

**Sec. 13-16. - Installation prior to street paving.**

Before any street containing a sewer line is paved, the City shall cause to be installed all service lines as the City determines necessary to serve said property when fully developed.

*(Prior code 12-530-19)*

**Sec. 13-17. - Repairs and extensions of mains.**

The City reserves the right to stop service from any street main when necessary to make repairs or extensions of the sewer mains or to perform any other work necessary to maintain the sewer utility. Unless it is an emergency situation, the City will attempt to give reasonable notice to the sewer users. No claim shall be made against the City by reason of any breakage or for any other damage that may result from lack of sewer service for repairing or replacing mains or other connections.

*(Prior code 12-530-20)*

**Sec. 13-18. - Supplying sewer service to others.**

No occupant or owner of any building or lot into which sewer service is introduced will be allowed to supply sewer service to other persons, families or firms, except as approved by the Operations Director. The Fort Lupton Utility Enterprise Board agrees to furnish service for a specified sum. If a sewer user furnishes other persons sewer service for building purposes or permits sewer service to be used without the knowledge and consent of the Operations Director the owner or occupant shall be deemed in violation of contract, and sewer users so offending will be required to pay double the price of service so used, and the Fort Lupton Utility Enterprise Board reserves the right to shut off the water supply for abuses of privileges. When the water has been turned off for violation thereof, the water will not be turned on again until all fees and penalties have been paid.

*(Prior code 12-530-22; Ord. 96-698 §1)*

**Sec. 13-19. - Use outside City corporate limits.**

Use of sewer service outside the corporate limits shall be permitted subject to the paramount rights of users within the corporate limits. The use of sewer service outside the City corporate limits shall be at the sole discretion of the Fort Lupton Utility Enterprise Board. In case there shall be insufficient capacity to provide for users both within and without the corporate limits, the Fort Lupton Utility Enterprise Board may reduce, curtail or shut off the sewer users outside the City corporate limits during such period of capacity shortage. The rates for sewer use outside the City corporate limits shall be adopted by written resolution of the Fort Lupton Utility Enterprise Board.

*(Prior code 12-530-23; Ord. 96-698 §1)*

**Sec. 13-20. - Use of public sewers.**

(a) No person shall discharge or cause to be discharged any nonsanitary waters such as stormwater, surface water, groundwater, roof runoff or subsurface drainage to any sanitary sewer, except by written permission of the Operations Director.

(b) Stormwater other than that exempted under Subsection (a) above and all other unpolluted drainage shall be discharged to such sewers as are specifically designated as storm sewers, or to a natural outlet approved by the Operations Director and/or Wastewater Plant Manager and other regulatory agencies. Unpolluted industrial cooling water or process water or air conditioning wastewater may be discharged, on approval of the Operations Director and/or the Wastewater Plant Manager, to a sanitary sewer as permitted.

(c) No person shall discharge or cause to be discharged to any public sewer any of the following described domestic, commercial or industrial water or wastes not meeting the following limitations:

(1) Must have an instantaneous pH value in the range of five and one-half (5.5) to nine (9.0) standard units. Must not contain pollutants which will cause corrosive effects, damage or hazards to structures, equipment or personnel of the treatment works or Public Works Department.

(2) Solid or viscous substances in quantities or of such size capable of causing obstruction to the flow in sewers or other interference with the proper operation of the collecting system or wastewater facilities such as, but not limited to, ashes, cinders, sand, mud, straw, shavings, metal, glass, rags, feathers, tar, plastics, wood, unground garbage, whole blood, paunch manure, hair and fleshings, entrails, paper dishes, cups, milk containers, etc., either whole or ground by garbage grinders.

(3) Must not contain improperly shredded garbage that has not been ground or comminuted to such a degree that all particles will be carried freely in suspension under flow conditions normally prevailing in the wastewater system to which the user is connected. At all times, no particle shall be greater than one-half (½) inch in any direction.

(4) Must not contain explosive mixtures consisting of liquids, solids or gases which by reason of their nature or quantity are, or may be, sufficient either alone or by interaction with other substances to cause fire or explosion or be injurious in any other way to the operation of sewers or the treatment works. At no time shall two (2) successive readings on an explosion hazard meter at the point of discharge into the wastewater system be more than five percent (5%), nor may any single reading be over ten percent (10%) of the lower explosive limit (L.E.L.) of the meter. Prohibited materials include but are not limited to: arsenic, cadmium, chromium, chromium, copper, lead, mercury, molybdenum, nickel, selenium, silver, zinc, benzene, BTEX, gasoline, kerosene, fuel oil, naphtha, benzene, toluene, xylene, ethers, alcohols, ketones, aldehydes, peroxides, chlorates, perchlorates, bromates, carbides, hydrides and sulfides.

(5) Must not contain pollutants which create a fire or explosion hazard in the treatment works, including but not limited to waste streams with a closed cup flashpoint of less than eighty-six degrees (86°) Centigrade (187° Fahrenheit) using the test methods specified in 40 C.F.R § 261.21. Pollutants must not contain any flammable substance with a flashpoint lower than eighty-six degrees (86°) Centigrade (187° Fahrenheit).

(6) Must not contain heat in amounts which will inhibit biological activity in the treatment works resulting in interference, but in no case heat in such quantities that the temperature at the treatment works exceeds forty degrees (40°) Centigrade (104° Fahrenheit). At no time shall the temperature of the water or wastes at the point of discharge into the public sewer be less than thirty-two degrees (32°) Fahrenheit or more than one hundred fifty degrees (150°) Fahrenheit.

(7) Must not contain grease or oil or other substances that will solidify or become viscous between thirty-two degrees (32°) degrees Fahrenheit and one hundred fifty degrees (150°) Fahrenheit.

(8) Must not contain insoluble substances in excess of ten thousand (10,000) parts per million.

(9) Must not contain solids in excess of twenty thousand (20,000) parts per million.

(10) Must not contain insoluble substances having a specific gravity greater than 2.65.

(11) Must not contain gases or vapors either free or occluded in concentrations toxic or dangerous to humans or animals.

(12) Must not contain toxic, carcinogenic, poisonous, irritating, noxious or malodorous solids, liquids or gases in sufficient quantity, either singly or by interaction with other wastes, which could contaminate the sludge of any municipal system, injure or interfere with any sewage treatment

process, constitute a hazard to humans or animals, create a public nuisance, create a hazard to treatment plant employees, Public Works employees or create any hazard in or have an adverse effect on the waters receiving any discharge from the treatment works.

(13) Must not have a chlorine demand greater than fifteen (15) parts per million.

(14) Must not contain any pollutant, including oxygen demanding pollutants (BOD, etc.) released at a rate and/or concentration which has a reasonable potential, in the opinion of the Operations Director and/or Wastewater Plant Manager to adversely affect the treatment plant (inhibition, pass-through of pollutants, sludge contamination, or endangerment of treatment plant workers and/or Public Works employees).

(15) Must not have a BOD in excess of three hundred twenty-five (325) milligrams per liter.

(16) Must not contain in excess of fifty (50) parts per million of fat, grease or any other fat or grease products from animal or vegetable origin, or both. Oil, floatable oil, nonbiodegradable cutting oil or any substance from mineral or petroleum origin, or both, including but not limited to: Cooling or quenching oils, lubrication oils, cutting oils and nonsaponifiable oils must not exceed ten (10) parts per million.

(17) Must not contain organic toxic pollutants, introduced by the intentional or accidental dumping of solvents, used in operations involving degreasing, surface preparation, tank washing, paint thinning, paint equipment cleaning or any other process.

(18) Shall not be any trucked or hauled pollutant, except as approved by the Operations Director and/or Wastewater Plant Manager and discharged at a point designated by the Operations Director and/or Wastewater Plant Manager.

(19) Must not contain storm water, surface water, groundwater, roof runoff or subsurface drainage without first obtaining a permit from the control authority for such a discharge.

(20) Must not contain the following pollutants in excess of the following limits as measured at the point of discharge into the wastewater system:

| **Pollutant** | **Milligrams per Liter** |
|---|---|
| Total Iron | 1.5 |
| Total Cadmium | 0.05 |
| Total Chromium | 4.5 |
| Total Copper | 0.5 |
| Total Lead | 2.0 |
| Total Mercury | 0.007 |
| Total Nickel | 10.0 |
| Total Zinc | 4.0 |
| Total Arsenic | 0.1 |
| Total Cyanide | 1.0 |
| Total Phenols | 10.0 |
| Total Silver | 0.5 |
| Total Selenium | 12.0 |

(21) Must not contain any radioactive wastes or isotopes.

(d) The following described substances, materials, waters or wastes shall be limited in discharges to municipal systems, to concentrations or quantities which will not harm either the sewers, wastewater treatment processes or equipment, will not have an adverse effect on the receiving stream, or will

not otherwise endanger lives, limb or public property or constitute a nuisance. The limitations or restrictions on materials or characteristics of wastes or wastewaters discharged to the sanitary sewer which shall not be violated without approval of the Operations Director and/or Wastewater Plant Manager are as follows:

(1) Any garbage that has not been properly shredded (See Subsection (c)(3) above). Garbage grinders may be connected to sanitary sewers from homes, hotels, institutions, restaurants, hospitals, catering establishments or similar places where garbage originates from the preparation of food in kitchens for the purpose of consumption on the premises or when served by caterers.

(2) Any waters or wastes containing iron, chromium, copper, lead, zinc and similar objectionable or toxic substances (See Subsection (c)(20) above) to such a degree that any such material received in the composite wastewater at the wastewater treatment plant exceeds the limits established by the Operations Director and/or Wastewater Plant Manager for such materials.

(3) Any waters or wastes containing grease, oil, nonbiodegradable cutting oil or any oily substance from petroleum or mineral origin, or both (See Subsection (c)(16) above), to such a degree that any such material received in the composite wastewater at the wastewater treatment plant exceeds the limits established by the Operations Director and/or Wastewater Plant Manager for such materials.

(4) Any waters or wastes containing floatable oil, fat, grease or any oily substance of vegetable or animal origin, or both (See Subsection (c)(16) above) to such a degree that any such material received in the composite wastewater at the wastewater treatment plant exceeds the limits established by the Operations Director and/Wastewater Plant Manager for such materials.

(5) Any waters or wastes containing suspended solids of such character and quantity that unusual attention or expense is required to handle such materials at the treatment plant.

(6) Any waters or wastes containing noxious or odor-producing substances exceeding limits which may be established by the Operations Director and/or Wastewater Plant Manager.

(7) Quantities of flow, concentrations or both which constitute a slug as defined in Subsection 13-1(20).

(8) Waters or wastewaters which are not amenable to treatment or reduction by the wastewater treatment processes employed, or are amenable to treatment only to such a degree that the wastewater treatment plant effluent cannot meet the requirements of other agencies having jurisdiction over discharge to the receiving waters.

(9) Any waters or wastes which, by interaction with other waters or wastes in the public sewer system, release obnoxious gases, form suspended solids which interfere with the collection system or create a condition deleterious to structures and treatment processes.

(e) If any waters or wastes are discharged, or are proposed to be discharged, to the public sewers that contain the substances or possess the characteristics enumerated in Subsection (d) above, and which in the judgment of the Operations Director and/or Wastewater Plant Manager may have a deleterious effect upon the wastewater facilities, processes, equipment or receiving waters, or which otherwise create a hazard to life or safety or constitute a public nuisance, the Operations Director and/or Wastewater Plant Manager may:

(1) Reject the wastes;

(2) Require pretreatment to an acceptable condition for discharge to the public sewers;

(3) Require control over the quantities and rates of discharge; and/or

(4) Require payment to cover the added cost of handling and treating the wastes not covered by existing taxes or sewer charges under the provisions of Subsection (j) below.

When considering the above alternative, the Operations Director and/or Wastewater Plant Manager shall give consideration to the economic impact of each alternative on the discharger. If the Operations Director and/or Wastewater Plant Manager permits the pretreatment or equalization of waste flows, the design and installation of the plants and equipment shall be subject to the review and approval of the Operations Director and/or Wastewater Plant Manager.

(f) Grease, oil and sand interceptors or traps should be cleaned quarterly, or at the discretion of the Operations Director. The Operations Director and/or Wastewater Plant Manager may take samples as needed and apply surcharges accordingly. All testing charges are to be paid by owner. Grease, oil and sand interceptors or traps or best available technology shall be provided when, in the opinion of the Operations Director and/or Wastewater Plant Manager they are necessary for the proper handling of liquid wastes containing floatable grease in excessive amounts as specified in Subsection (c)(16) above, or any flammable wastes, sands or other harmful ingredients; except that such interceptors shall not be required for private living quarters or dwelling units. All interceptors or traps shall be of a type and capacity approved by the Operations Director and/or Wastewater Plant Manager and shall be located as to be readily and easily accessible for cleaning and inspections. In the maintaining of these interceptors, the owner shall be responsible for the proper removal and disposal by appropriate means of the captured material and shall maintain records of the dates and means of disposal which are subject to review by the Operations Director and/or Wastewater Plant Manager. Any removal and hauling of the collected materials not performed by the owner's personnel must be performed by currently licensed waste disposal companies, firms or persons.

(g) Where pretreatment of any flow-equalizing facilities are provided or required for any waters or wastewaters, they shall be maintained continuously in satisfactory and effective operation by the owner and at the owner's expense.

(h) When required by the Operations Director and/or Wastewater Plant Manager the owner of any property serviced by a building sewer service carrying industrial wastes shall install a suitable structure together with such necessary meters and other appurtenances in the building sewer to facilitate observation, sampling and measurement of the wastes. Such structures, when required, shall be accessibly and safely located, and shall be constructed in accordance with plans approved by the Operations Director and/or Wastewater Plant Manager. The structure shall be installed by the owner at the owner's expense and shall be maintained by the owner so as to be safe and accessible at all times.

(i) The Operations Director and/or Wastewater Plant Manager may require a user of sewer services to provide information needed to determine compliance with this Article. The requirements may include:
   (1) Peak wastewater discharge rates and volumes over a specified time period;
   (2) Chemical analyses of wastewaters;
   (3) Information on materials being discharged that affect wastewater characteristics;
   (4) Quantity and disposition of specific liquid, sludge, oil, solvent or other materials important to sewer use control;
   (5) A plot plan of sewers of the user's property showing sewer and pretreatment facility location;
   (6) Details of wastewater pretreatment facilities;

(7) Details of systems to prevent and control the losses of materials through spills to the municipal sewer; and

(8) Additional information that affects the volume or characteristics of discharges and, as such, may be required by the Operations Director and/or Wastewater Plant Manager to determine compliance with this Article.

(j) All measurements, tests and analyses of the characteristics of waters and wastes to which reference is made in this Article shall be determined in accordance with the latest edition of "Standard Methods of the Examination of Water and Wastewater," published by the American Public Health Association. Sampling methods, location, times, durations and frequencies are to be determined on an individual basis subject to approval by the Operations Director and/or Wastewater Plant Manager.

(k) No statement contained in this Section shall be construed as preventing any special agreement or arrangement between the Fort Lupton Utility Enterprise Board and any industrial concern whereby an industrial waste of unusual strength or characteristic may be accepted by the Fort Lupton Utility Enterprise Board for treatment.

(l) All regulations contained in this Section shall be considered a part of the contract of every person receiving sewer service from the sewer system and wastewater treatment facilities, and no person may be served from the sewer utility unless the person agrees to and abides by all rules and regulations of the Fort Lupton Utility Enterprise Board pertaining to the use of said sewer system.

(m) Any directives, approvals, disapprovals or other administrative actions issued by the Operations Director and/or Wastewater Plant Manager to a discharger can be requested by the discharger to be referred to the Fort Lupton Utility Enterprise Board for review. The Fort Lupton Utility Enterprise Board shall act on such issues referred to it for review, and its decisions shall be the final authority regarding interpretations, actions and other compliance issues associated with the City's sewer and wastewater treatment ordinance.

*(Ord. 616 §1, 1992; Ord. 645 §1, 1993; Ord. 96-698 §1; Ord. 99-739; Ord. 2015-994 §49)*

**Sec. 13-21. - Application for sewer service.**

(a) Application for sewer shall be made to the Planning and Development Department by the owner, occupant, developer or agent of the property to be benefited and must designate the location of the property, owner of the property, size of sewer taps, location of sewer taps and sewer service line, the approximate date of construction of the facility; and shall state the purpose for which sewer service is required.

(b) All sewer tap permits issued shall be issued for a period of one hundred eighty days (180) days, in the same manner as building permits are issued.

*(Prior code 12-530-5; Ord. 645 §1, 1993; Ord. 96-698 §1; Ord. 2001-778)*

**Sec. 13-22. - Types of permits.**

There shall be the following types of permits to make connections with the sewer system and wastewater treatment facilities:

(1) Sewer tap permit to connect to the sewer system for the purpose of discharging into the sewer system for normal municipal purposes; that is, domestic, commercial or industrial. At the time this permit is granted, the sewer plant investment fee in effect at the time of application, together with all other costs associated with the granting of permission to connect with the sewer system of the City, shall be paid.

(2) Sewer tap permit to enlarge or replace an existing sewer tap to the sewer system for the purpose of discharging into the sewer system for normal municipal purposes; that is, domestic, commercial or industrial. At the time the permit is granted, the additional sewer plant investment fee, if any, shall be paid.
(3) Permit to discharge into the sewer system to serve property situated outside the corporate limits of the City. This permit shall be issued only under such terms and conditions as the Fort Lupton Utility Enterprise Board may provide by ordinance or resolution. At the time the sewer tap permit is granted, the sewer plant investment fee shall be paid for each individual sewer service.
(4) 40 CFR Section 03.3(q) requires industries designated as a "significant users" to acquire a discharge permit through the state of Colorado. The City of Fort Lupton does not currently issue these permits. It is a requirement that any industry contact the Colorado Department of Public Health and environment treatment division to determine if a discharge permit is required.

*(Prior code 12-530-12; Ord. 96-698 §1; Ord. 2015-994 §50)*

**Sec. 13-23. - Permit contents.**

Required sewer permits shall be issued by the Planning and Development Department and shall state the name of the person to whom the permit is issued, the date of the permit, the size of the tap, the owner of the premises and the premises to be served by the sewer system.

*(Prior code 12-530-13; Ord. 96-698; Ord. 96-698; Ord. 2001-778)*

**Sec. 13-24. - Taps.**

All taps or connections to any part of the sewer utility shall be made in accordance with current City specifications and terms and conditions of the permit issued. All such taps and connections shall be made by a licensed plumber or the City's authorized representative, at the owner's expense, and all materials for such taps or connections shall be at the owner's expense and shall be inspected by the City prior to use.

*(Prior code 12-530-14; Ord. 645 §1, 1993; Ord. 2015-994 §51)*

**Sec. 13-25. - Separate connections required.**

Two (2) or more premises cannot be served from one (1) and the same connection, nor can two (2) or more buildings on the same premises be served from one (1) and the same connection. All properties that require separate sewer service billings shall have their own connection and service line.

*(Prior code 12-530-15)*

**Sec. 13-26. - Sewer rate schedules.**

(a) Each user of the sewer system and wastewater treatment facilities shall be charged a monthly sewer user charge. Such charge shall be established, and amended from time to time, by written resolution of the Fort Lupton Utility Enterprise Board, and such amendments after January 1, 1997, shall be after publication and a minimum of two (2) public meetings, which amends the process described in Ordinance 95-675, Section 12-9 (2).
(b) For all metered residential, commercial and industrial users who irrigate lawn or other landscaping during the months of May through October, the sewer use charge on bills may be adjusted to reflect the average monthly water use reflected in the preceding January, February and March sewer billings (represents the usage of December, January and February); however, wastewater facility users obtaining the rate benefits of this Section may be required to submit to a review of their water use at such times as may be designated by the Operations Director.

(c) The Fort Lupton Utility Enterprise Board shall review the wastewater facilities' total annual costs of operation, maintenance, replacement and debt service at least once every year. Rates may be revised if necessary to generate revenue, combined with all other revenues of the utility, sufficient to pay all said costs. Such rates shall be established to proportionately recover all operation, maintenance and replacement costs from users of the wastewater facilities, including those costs associated with mitigating inefficiency, infiltration and inflow.

(d) From and after July 1, 1999, the Fort Lupton Utility Enterprise Board may, notwithstanding any other provision of this Section, approve a negotiated rate or rates for sewer utility service for a large and/or unique user, taking into consideration the requirement of Subsection (c) above that such negotiated rates recover the operation and maintenance and replacement costs occasioned as a consequence of such user. Notwithstanding the requirements of Subsection (a) above, any such negotiated rates shall be effective upon approval by the Utility Enterprise Board by majority vote.

*(Ord. 626 §1, 1992; Ord. 634 §1, 1992; Ord. 645 §1, 1993; Ord. 96-698 §1; Ord. 99-739; Ord. 99-750, Part 1; Ord. 2009-909 §1)*

**Sec. 13-27. - Sewer plant investment fees.**

(a) All sewer plant investment fees shall be determined by the Fort Lupton Utility Enterprise Board. Such fees shall be established and amended from time to time by written resolution of the Fort Lupton Utility Enterprise Board.

(b) Upon payment of the sewer plant investment fee, the Planning and Development Department shall issue a permit and allow a fee service line tap into the City's sewer system.

(c) The sewer plant investment fee shall be placed into the Sewer Plant Investment Fee Account. Said account shall be used for future improvements or additions to the sewer system and wastewater treatment facilities.

*(Prior code 12-530-27; Ord. 96-698 §1; Ord. 99-739; Ord. 2001-778)*

**Sec. 13-28. - Nonmetered sewer accounts.**

Services which are on well water and which are connected to the City's wastewater treatment system shall be billed for sewer consistent with regulations under Section 13-26.

*(Ord. 99-739)*

# CITY OF FORT LUPTON
# CITY COUNCIL

Zo Stieber, Mayor

Valerie Blackston, Ward 1
Chris Ceretto, Ward 2
Carlos Barron, Ward 3

David Crespin, Ward 1
Claud Hanes, Ward 2
Bruce Fitzgerald, Ward 3

**AM 2022-029**

**APPROVING AN ORDINANCE AMENDING FORT LUPTON MUNICIPAL CODE, CHAPTER 2 ARTICLE II, MAYOR AND CITY COUNCIL, SECTION 2-26 (a) REGULAR MEETINGS OF CITY COUNCIL AND ENTERPRISE BOARDS**

I. Agenda Date: Council Meeting – February 1, 2022

II. Attachments: a. Proposed Ordinance

III. Summary Statement:

The Fort Lupton City Council wishes to adjust the time of the Regular City Council meetings and the Town Hall meetings to 6 p.m. Meeting dates and times of the City Council regular meetings are set by Ordinance. The ordinance shall be amended to set the meeting days and times by Resolution. . The City Council acts as the City's Enterprise Boards and meetings are held concurrent with and integrated with the regular agenda.

IV. Submitted by: _____
Mari Peña, City Clerk

V. Finance Reviewed _____
Finance Director

VI. Approved for Presentation: _____
City Administrator

VII. Attorney Reviewed _____ Approved _____ Pending Approval

VIII. Certification of Council Approval: _____ _____
City Clerk Date

IX. Detail of Issue/Request:

The amendment to the Ordinance will allow for City Council and Enterprise Boards meetings to be set by Resolution.

Sec. 2-26. - Regular meetings of City Council and Enterprise Boards.

(a)Regular meetings of the City Council shall be ~~held on the first and third Tuesday of each month at the City Hall at 7:00 p.m.~~ set by Resolution. Regular meetings of any of the City's Enterprise Boards shall be held ~~on the first and third Tuesday of each month~~ concurrent with and integrated with the regular agenda and minutes of those City Council meetings. If a ~~Tuesday~~ meeting falls on a national and/or state holiday, that ~~Tuesday~~ meeting will be held ~~on the next day, Wednesday,~~ the following day unless otherwise directed by City Council.

(b)Special meetings of any Enterprise Board shall be called in the same manner as special meetings of the City Council, as provided in Section 2-27 of this Code.

X. Legal/Political Considerations:

XI. Alternatives/Options:

1. Approve the change.
2. Don't approve the change.

XII. Financial Considerations:

There are no financial considerations.

XIII. Staff Recommendation:

Staff seeks recommendation.

**ORDINANCE NO. 2022-10xx**
**INTRODUCED BY:**

**AN ORDINANCE OF THE CITY OF FORT LUPTON, COLORADO, AMENDING SPECIFIC SECTIONS 2-26 REGULAR MEETINGS OF THE CITY COUNCIL AND ENTERPRISE BOARDS OF THE FORT LUPTON MUNICIPAL CODE**

**WHEREAS**, City Council deems it necessary to revise specific provisions of the Fort Lupton Municipal Code; and

**WHEREAS**, City Council finds that it is the best interest of the health, safety and welfare of the citizens that the provisions set forth herein be enacted.

NOW THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF FORT LUPTON, COLORADO, AS FOLLOWS:

Section 1: Chapter 2, Article II, Section 2-26 of the Fort Lupton Municipal Code is hereby amended as follows:

**Sec. 2-26. Regular meetings of City Council and Enterprise Boards.**

(a) Regular meetings of the City Council shall be set by Resolution. Regular meetings of any of the City's Enterprises Boards shall be held concurrent with and integrated with the regular agenda and minutes of those City Council meetings. If a meeting falls on a national and/or state holiday, that meeting will be held on the next day unless otherwise directed by City Council.

(b) Special meetings of any Enterprise Board shall be called the same manner as special meetings of the City Council, as provided in Section 2-27 of this Code.

**INTRODUCED, READ, AND PASSED ON FIRST READING, AND ORDERED PUBLISHED** this 1st day of February 2022.

**PUBLISHED** in the Fort Lupton Press the. 10th day of February 2022.

**FINALLY READ BY TITLE ONLY, PASSED AND ORDERED FINALLY PUBLISHED** by title only this __th day of __ 2022.

**PUBLISHED BY TITLE ONLY** the __th day of __ 2022.

**EFFECTIVE** (after publication) the __th day of __ 2022.

CITY OF FORT LUPTON, COLORADO

_____

Zo Stieber, Mayor

ATTEST:

_____

Maricela Peña, City Clerk

Approved as to form:

_____

Andy Ausmus, City Attorney

# CITY OF FORT LUPTON
# CITY COUNCIL

Zo Stieber, Mayor

Valerie Blackston, Ward 1
Chris Ceretto, Ward 2
Carlos Barron, Ward 3

David Crespin, Ward 1
Claud Hanes, Ward 2
Bruce Fitzgerald, Ward 3

**AM 2022-030**

**AN ORDINANCE BY THE FORT LUPTON CITY COUNCIL ACTING AS THE UTILITY ENTERPRISE BOARD, AMENDING SECTION 13-26 SEWER RATE SCHEDULES, SECTION 13-136 WATER RATE SCHEDULES, SECTION 13-135 WATER METER READINGS, AND SECTION 13-145 WATER LEAKS OF CHAPTER 13 MUNICIPAL UTILITIES, OF THE FORT LUPTON MUNICIPAL CODE**

I. Agenda Date: Council Meeting – February 1, 2022

II. Attachments:
a. Detail of Municipal Code Changes
b. Ordinance

III. Summary Statement:

Amend various sections of Chapter 13, Municipal Utilities, of the Fort Lupton Municipal Code.

IV. Submitted by: _____
Leann Perino, Finance Director

V. Finance Reviewed _____
Finance Director

VI. Approved for Presentation: _____
City Administrator

VII. Attorney Reviewed Approved Pending Approval

VIII. Certification of Council Approval: _____ _____
City Clerk Date

IX. Detail of Issue/Request:

The summary of amendments to Chapter 13 of the Fort Lupton Municipal Code are as follows:

1. Amend Section 13-26(b) describing summer sewer rates. Changes the summer season as March through October. Current code defines summer sewer season as May through October. Add a section describing the method used to charge customers with no usage history from December to February.

2. Amend Section 13-135(b) remove and renumber. In the current code section 13-135(b) is a duplicate of 13-135(a). 13-135(c) would become 13-135(b)

3. Amend Section 13-26(a) and Section 13-136(a) describing the process used to change water and sewer rates. Adding 1 public hearing with at least 30 days publication notice. The changes are intended to conform with C.R.S. 40-3.5-104

4. Amend Section 13-145 describing the process for water leak credit. Define the time limit for customers to apply for a water leak and describe the process used by the customer to apply for the credit, and define the method of calculating the leak credit.

The amendments are detailed in Attachment 'A'

X. Legal/Political Considerations:

City attorney has reviewed and approved.

XI. Alternatives/Options:

Do not make changes to the code.

XII. Financial Considerations:

None

XIII. Staff Recommendation:

Staff recommends amending the various sections of Chapter 13, Municipal Utilities of the Fort Lupton Municipal Code.

## Sec. 13-136. Water rate schedules.

(a) Each user of the water system and water treatment facilities shall be charged a monthly user charge. Such charge shall be established, and amended from time to time, by written resolution of the Fort Lupton Utility Enterprise Board, and such amendments after ~~January 1, 1997~~April 16, 2022, shall be after publication and a ~~minimum of two (2)~~ public hearing~~meetings~~, which amends the process described in Ordinance 95-675, Section 12-9 (2). Notice shall be published at least thirty days prior to the date set for the public hearing and adoption of the new schedule.

(b) The Fort Lupton Utility Enterprise Board shall review the water facilities' total annual costs of operation, maintenance, replacement and debt service at least once every year. Rates may be revised if necessary to generate revenue, combined with all other revenues of the utility, sufficient to pay all said costs. Such rates shall be established to proportionately recover all operation, maintenance and replacement costs from users of the water facilities, including those costs associated with mitigating inefficiency and line loss.

(c) From and after July 1, 1999, the Fort Lupton Utility Enterprise Board may, notwithstanding any other provision of this Section, approve a negotiated rate or rates for water utility service for a large and/or unique user from the City's municipal well water system only, taking into consideration the requirement of Subsection (b) above that such negotiated rates recover the operation and maintenance and replacement costs occasioned as a consequence of such user. Notwithstanding the requirements of Subsection (a) above, any such negotiated rates shall be effective upon approval by the Utility Enterprise Board by majority vote.

(Ord. 631 §1, 1992; Ord. 96-698; Ord. 99-739; Ord. 99-750, Part 2; Ord. 2009-909 §2)

## Sec. 13-26. Sewer rate schedules.

(a) Each user of the sewer system and wastewater treatment facilities shall be charged a monthly sewer user charge. Such charge shall be established, and amended from time to time, by written resolution of the Fort Lupton Utility Enterprise Board, and such amendments after ~~January 1, 1997~~April 16, 2022, shall be after publication and ~~a~~one (1) ~~minimum of two (2)~~ public hearing ~~meetings~~, which amends the process described in Ordinance 95-675, Section 12-9 (2). Notice shall be published at least thirty days prior to the date set for the public hearing and adoption of the new schedule.

(b) For all metered residential, commercial and industrial users who irrigate lawn or other landscaping during the months of ~~May~~ March through October, the sewer use charge on bills may be adjusted to reflect the average monthly water use reflected in the preceding January, February and March sewer billings (represents the usage of December, January and February); however, wastewater facility users obtaining the rate benefits of this Section may be required to submit to a review of their water use at such times as may be designated by the Operations Director. Customers with less than 100 gallons of water usage or new customers with no usage on the preceding January, February, and March utility bills (representing December, January, and February usage) will be charged a minimum usage based on the average usage of customers, with usage, in their customer class in the December, January, and February usage period. Customers with no water history may be moved to actual usage upon customer request. Customers moved to actual may not change back that calendar year.

(c) The Fort Lupton Utility Enterprise Board shall review the wastewater facilities' total annual costs of operation, maintenance, replacement and debt service at least once every year. Rates may be revised if necessary to generate revenue, combined with all other revenues of the utility, sufficient to pay all said costs. Such rates shall be established to proportionately recover all operation, maintenance and replacement costs from users of the wastewater facilities, including those costs associated with mitigating inefficiency, infiltration and inflow.

(d) From and after July 1, 1999, the Fort Lupton Utility Enterprise Board may, notwithstanding any other provision of this Section, approve a negotiated rate or rates for sewer utility service for a large and/or unique user, taking into consideration the requirement of Subsection (c) above that such negotiated rates recover the operation and maintenance and replacement costs occasioned as a consequence of such user. Notwithstanding the requirements of Subsection (a) above, any such negotiated rates shall be effective upon approval by the Utility Enterprise Board by majority vote.

(Ord. 626 §1, 1992; Ord. 634 §1, 1992; Ord. 645 §1, 1993; Ord. 96-698 §1; Ord. 99-739; Ord. 99-750, Part 1; Ord. 2009-909 §1)

## Sec. 13-135. Water meter readings.

(a) The schedule of water rates shall be applied to water used or consumed as determined by the water meter ~~readings which~~readings, which are made by the City.

( ~~b) The schedule of water rates shall be applied to water used or consumed as determined by the water meter readings which are made by the City.~~

(c~~)~~b Water meters are to be read to the nearest one thousand (1,000) gallons, thus any meter containing a portion of one thousand (1,000) gallons should be rounded off to the nearest one thousand (1,000) gallons.

(Prior code 12-405-7)

## Sec. 13-145. Water leaks.

Inasmuch as it is to the benefit of the entire community to conserve water, a property owner who provides proof that they fixed a water leak on their property ~~in a prompt and timely manner~~ within three (3) months of the start of high water usage may receive a credit adjustment on their next utility bill ~~consistent with regulations under Section 13-135~~. It is the intent of this policy that the City will share in the cost of the excess water in order to encourage the property owner to fix any water leaks in a timely fashion.

(a) Customers are required to complete a form to request a review of their utility bill, documenting when the leak occurred and other applicable information such as a plumbing invoice, or an itemized receipt for materials and supplies purchased to repair the leak. The burden of proof as to whether there was a leak and that the leak was repaired is on the customer.

~~(a)~~(b) If, in the judgment of the City Administrator or his/her designee, the documentation is complete and the repair was fixed within three months of the start of the high water usage, the City shall compute a credit adjustment for the next billing cycle. The adjustment shall be based upon the previous year's history, or if there is no history, the adjustment shall be calculated based on the average usage in the City for comparable customer types with water usage. If the leak occurred during December-February, which is utilized to calculate "summer" sewer rates, then the "summer" sewer rate shall be recalculated. In no case shall a utility bill be adjusted in which high consumption occurred for three consecutive billing cycles.

Document: C.R.S. 40-3.5-104

# C.R.S. 40-3.5-104

Copy Citation

Statutes current through all 2021 Regular Session legislation, as compiled and edited by the Colorado Office of Legislative Legal Services.

**Colorado Revised Statutes Annotated > Title 40. Utilities (§§ 40-1-101 — 40-42-108) > Public Utilities (§§ 40-1-101 — 40-17.5-105) > General and Administrative (Arts. 1 — 9.7) > Article 3.5. Regulation of Rates and Charges by Municipal Utilities (§§ 40-3.5-101 — 40-3.5-107)**

## 40-3.5-104. **Changes** in **rates** - notice and public hearing.

**(1)**

**(a)** No **change** shall be made by any municipal utility in any **rate** or charge or in any rule, regulation, or contract relating to or affecting any base **rate**, charge, or service, or in any privilege or facility, except after thirty days' notice to the public. Such notice shall be given by keeping open for public inspection new schedules stating plainly the **changes** to be made in the schedules then in force and the time when the **changes** will go into effect. In addition, such notice shall be given by publishing the proposed new schedule, or if that is impractical due to the size or bulk of the proposed new schedule, by publishing a notice of the availability of the proposed new schedule for public inspection, at least once in at least one newspaper of general circulation in the authorized service area at least thirty days and no more than sixty days prior to the date set for public hearing on and adoption of the new schedule.

**(b)** In addition to the notice provided for in paragraph (a) of this subsection (1), if a municipal utility serves customers who live outside the municipal corporate boundaries, notice of any **change** in any **rate** or charge or in any rule, regulation, or contract relating to or affecting any base **rate**, charge, or service or any **change** in any privilege or facility shall be given by mailing to such customer notification of any such **change**.

**(2)** The notice required by subsection (1) of this section shall also specify the date, time, and place at which the public hearing shall be held by the governing body of the municipal utility to consider the proposed new schedule. The notice shall specify that each municipal utility customer shall have the right

to appear, personally or through counsel, at such hearing for the purpose of providing testimony regarding the proposed new schedule. Said public hearing shall be held on the date and time and at the

place set forth in the notice; except that the governing body of the municipal utility may adjourn and reconvene said hearing as it deems necessary.

**(3)** The governing body of the municipal utility, for good cause shown, may allow **changes** without requiring the thirty days' notice and public hearing by an order specifying the **changes** to be made, the circumstances necessitating the **change** without requiring the thirty days' notice and public hearing, the time when the **changes** shall take effect, and the manner in which the **changes** shall be published.

**(4)** Insofar as municipal utilities establish **rates**, charges, and tariffs and any regulations pertaining thereto in accordance with the provisions of this article, any conflict shall be resolved by the commission in accordance with the procedures contained in article 6 of this title upon the filing of a complaint by no less than five percent of the affected electric or natural gas customers outside the corporate limits of the municipality or by five such customers, whichever number is greater. Any such complaint shall be filed with the commission within thirty days after the final decision by the governing body of the municipality to **change** a **rate**, charge, or tariff or any regulation pertaining thereto. If such complaint is heard by the commission and is deemed not frivolous, all reasonable costs as determined by the commission, including reasonable attorney fees, shall be paid by the utility. In any hearing conducted pursuant to the provisions of this section, the burden of proof shall be sustained by the municipal utility.

## History

**Source: L. 83:**Entire article added, p. 1554, § 2, effective June 17.

## Annotations

## Research References & Practice Aids

**Hierarchy Notes:**

C.R.S. Title 40

Colorado Revised Statutes Annotated

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**Content Type:** Statutes and Legislation

**Terms:** water rate changes

**Narrow By:** custom: custom Sources: Colorado Revised Statutes Annotated

**Date and Time:** Jan 21, 2022 01:18:57 p.m. EST

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**ORDINANCE NO.** **2022-xx**

**INTRODUCED BY:** **xxx**

**AN ORDINANCE BY THE FORT LUPTON CITY COUNCIL ACTING AS THE UTILITIES ENTERPRISE BOARD, AMENDING SECTION 13-26 SEWER RATE SCHEDULES, SECTION 13-136 WATER RATE SCHEDULES, SECTION 13-135 WATER METER READINGS, AND SECTION 13-145 WATER LEAKS OF CHAPTER 13 MUNICIPAL UTILITIES, OF THE FORT LUPTON MUNICIPAL CODE**

**WHEREAS**, the Utilities Enterprise Board ("Board") wishes to amend various sections of Chapter 13 to establish average monthly water use reflected on the bills; and

**WHEREAS**, the bills include charges to all customers for their water and sewer usage during all seasons; and

**WHEREAS**, the Board recognizes summer usage includes irrigation that does not enter the wastewater treatment system.

**NOW THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF FORT LUPTON, WELD COUNTY, COLORADO:**

Section 1. Chapter 13, Section 13-26 (a) and (b) of the Fort Lupton Municipal Code is revised to read as follows:

**Sec. 13-26 Adoption.**

(a) Each user of the sewer system and wastewater treatment facilities shall be charged a monthly sewer user charge. Such charge shall be established, and amended from time to time, by written resolution of the Fort Lupton Utility Enterprise Board, and such amendments after April 16 2022, shall be after publication and a minimum of one (1) public hearing, which amends the process described in Ordinance 95-675, Section 12-9 (2). Notice shall be published once at least thirty days prior to the date set for the public hearing on and adoption of the new schedule.

(b) For all metered residential, commercial and industrial users who irrigate lawn or other landscaping during the months of March through October, the sewer use charge on bills may be adjusted to reflect the average monthly water use reflected in the preceding January, February and March sewer billings (represents the usage of December, January and February); however, wastewater facility users obtaining the rate benefits of this Section may be required to submit to a review of their water use at such times as may be designated by the Operations Director. Customers with less than 100 gallons of water usage or new customers with no usage on the preceding January, February, and March utility bills (representing December, January, and February usage) will be charged a minimum usage based on the average usage of customers, with usage, in their customer class in the December, January, and February usage period. Customers with no water history may be moved to actual usage upon customer request. Customers moved to actual may not change back that calendar year.

Section 2 Chapter 13, Section 13-135 (a) and (b) of the Fort Lupton Municipal Code is revised to read as follows:

**Sec. 13-135 Adoption**

(a) The schedule of water rates shall be applied to water used or consumed as determined by the water meter readings, which are made by the City.

(b) Water meters are to be read to the nearest one thousand (1,000) gallons, thus any meter containing a portion of one thousand (1,000) gallons should be rounded off to the nearest one thousand (1,000) gallons.

Section 3 Chapter 13, Section 13-136 (a) of the Fort Lupton Municipal Code is revised to read as follows

**Sec. 13-136(a) Adoption.**

(a) Each user of the water system and water treatment facilities shall be charged a monthly user charge., Such charge shall be established, and amended from time to time, by written resolution of the Fort Lupton Utility Enterprise Board, and such amendments after April 16 2022, shall be after publication and a one (1) public hearing which amends the process described in Ordinance 95-675, Section 12-9 (2). Notice shall be published once at least thirty days prior to the date set for the public hearing on and adoption of the new schedule.

Section 4 Chapter 13, Section 13-14 of the Fort Lupton Municipal Code is revised to read as follows

**Sec. 13-145. Water leaks.**

Inasmuch as it is to the benefit of the entire community to conserve water, a property owner who provides proof that they fixed a water leak on their property within three (3) months of the start of high water usage may receive a credit adjustment on their next utility bill -. It is the intent of this policy that the City will share in the cost of the excess water in order to encourage the property owner to fix any water leaks in a timely fashion.

(a) Customers are required to complete a form to request a review of their utility bill, documenting when the leak occurred and other applicable information such as a plumbing invoice, or an itemized receipt for materials and supplies purchased to repair the leak. The burden of proof as to whether there was a leak and that the leak was repaired is on the customer.

(b) If, in the judgment of the City Administrator or his/her designee, the documentation is complete and the repair was fixed within three months of the start of the high water usage, the City shall compute a credit adjustment for the next billing cycle. The adjustment shall be based upon the previous year's history, or if there is no history, the adjustment shall be calculated based on the average usage in the City for comparable customer types with water usage. If the leak occurred during December- February, which is utilized to calculate "summer" sewer rates, then the "summer" sewer rate shall be recalculated. In no case shall a utility bill be adjusted in which high consumption occurred for three consecutive billing cycles.

**INTRODUCED, READ, AND PASSED ON FIRST READING, AND ORDERED PUBLISHED** this 1st day of February 2022.

**PUBLISHED** in the Fort Lupton Press the 10th day of February 2022.

**FINALLY READ BY TITLE ONLY, PASSED AND ORDERED PUBLISHED BY TITLE ONLY** this __ day of __ 2022.

**PUBLISHED BY TITLE ONLY** the _ day of _ 2022.

**EFFECTIVE** (after publication) the _ day of _ 2022

City of Fort Lupton, Colorado

_____

Zo Stieber, Mayor

Attest:

_____

Maricela Peña, City Clerk

Approved as to form:

_____

Andy Ausmus, City Attorney

# CITY OF FORT LUPTON
# CITY COUNCIL

Zo Stieber, Mayor

Valerie Blackston, Ward 1
Chris Ceretto, Ward 2
Carlos Barron, Ward 3

David Crespin, Ward 1
Claud Hanes, Ward 2
Bruce Fitzgerald, Ward 3

**AM 2022-031**

**AUTHORIZE THE APPOINTMENT OF DA DAVIDSON & CO AS AN AGENT AND TENDER FACILITATOR FOR THE CITY OF FORT LUPTON EFFECTIVE FEBRUARY 1, 2022, FOR THE GOLF ENTERPRISE FUND**

I. Agenda Date: Council Meeting – February 1, 2022

II. Attachments: a. Agency Agreement

III. Summary Statement:

Dee Wisor of Butler Snow, LLP, as special counsel to the City Attorney, provided the legal recommendation that we appoint an agent to serve as the tender facilitator to assist in generating and extending a tender offer to remaining bond holders. This agreement fulfills the recommendation by appointing DA Davidson & Co (Kyle Thomas) as the facilitator.

IV. Submitted by: _____
Leann Perino

V. Finance Reviewed _____
Finance Director

VI. Approved for Presentation: _____
City Administrator

VII. Attorney Reviewed XX Approved Pending Approval

VIII. Certification of Council Approval: _____ _____
City Clerk Date

IX. Detail of Issue/Request:

Dee Wisor of Butler Snow, LLP, as special counsel to the City Attorney, provided the legal recommendation that we appoint an agent to serve as the tender facilitator to assist in generating and extending a tender offer to remaining bond holders. This agreement fulfills the recommendation by appointing DA Davidson & Co (Kyle Thomas) as the facilitator.

X. Legal/Political Considerations:

Following legal recommendation

XI. Alternatives/Options:

Appoint. DA Davidson & Co as our agent.

Not appoint DA Davidson & Co as our agent

XII. Financial Considerations:

This will be a supplemental budget appropriation.

XIII. Staff Recommendation:

Staff recommends that the Council appoint DA Davidson & Co to act as the City's agent and tender facilitator for the tender offer of the Golf Enterprise Fund effective February 1, 2022.

D|A DAVIDSON
FIXED INCOME CAPITAL MARKETS
1550 Market Street, Suite 300
Denver, CO 80202
303.764.6000
www.dadavidson.com/ficm
D.A. Davidson & Co. member SIPC

January 27, 2022

City of Fort Lupton
c/o Dee Wisor
Butler Snow, LLP
1801 California Street, Suite 5100
Denver, CO 80202

***RE: Letter Agreement for Investment Banking Services to City of Fort Lupton***

Ladies and Gentlemen,

This letter agreement confirms the terms and conditions upon which D.A. Davidson & Co. Fixed Income Capital Markets ("Davidson"), its successors or assigns will provide investment banking services to the City of Fort Lupton (the "Client").

The investment banking services rendered by Davidson under this agreement may include:

- Representing the Client as tender agent
- Analysis of the project's credit quality
- Analysis of the capital markets, including interest rates and terms available in the market
- Evaluating potential strategies to achieve the Client's goals
- Working with the Client's consultants and attorneys to determine the feasibility of various borrowing or restructuring options
- Advising the Client on the structure and terms of a restructured bond or a new bond or loan
- Coordinating with the Client's attorneys and consultants, the dissemination of financial data
- Negotiating the structure and terms of the tender with the holder on behalf of the Client
- Under the direction and legal advice of nationally recognized bond counsel, assist and supervise the steps necessary to be taken to close the transaction

Delivered with this letter are the disclosures required by MSRB Rule G-17 regarding our role, duties and interests as a tender agent of the Bonds. By signing this letter agreement, the Client acknowledges and agrees that: (i) the transaction contemplated by this Agreement will be an arm's length, commercial transaction between the Client and the purchaser, in which Davidson may be acting as an agent or as an tender agent, but not as a municipal advisor, financial advisor or fiduciary to the Issuer; (ii) Davidson has not assumed any fiduciary responsibility to the Client with respect to the transaction contemplated hereby and the discussions, undertakings and procedures leading thereto; (iii) the only obligations Davidson will have to the Client with respect to the transaction contemplated hereby are expressly set forth in this letter agreement; and (iv) the Issuer has consulted and will continue to consult with its own legal, accounting, tax, financial and other advisors, as

applicable, to the extent it deems appropriate. The representative of the Client signing this letter agreement has been duly authorized to execute this letter agreement and to act hereunder.

This letter agreement shall remain in full force and effect until such time as the Client notifies Davidson in writing of its intent to terminate this letter agreement. Davidson may resign and terminate this letter agreement by providing written notification with no less than 30 days prior notice to the Client.

At such time as arrangements for the sale of Bonds or other borrowing have been completed, Davidson shall be paid as follows:

- If more than 50% of the Bonds are tendered, Davidson shall be paid $30,000.00
- If less than 50% of the Bonds are tendered, Davidson shall be paid on a pro rata basis of $30,000.00 based on the percentage of Bonds that were tendered.
    - I.E. if 40% of the Bonds tendered Davidson would be paid $24,000.00 or (40% / 50%) x $30,000.00.

In addition to such compensation, the following shall be paid by Client as a component of the cost of issuance of the Bonds or placement of the debt: (i) legal fees incurred by Davidson's engagement of tender agent's counsel or placement agent's counsel in connection with the issuance of Bonds or placement of the debt, as applicable; and (ii) legal fees related to third-party review of past continuing disclosure compliance. Unless otherwise agreed to by Client, Client's payment of the foregoing is contingent upon the sale of Bonds or placement of debt.

This letter agreement is not an offer to purchase Bonds. If the sale of Bonds or other borrowing does not occur, Davidson shall not be owed compensation. Please indicate by your signature below your desire to engage D.A. Davidson & Co. Fixed Income Capital Markets to provide investment banking services on these terms.

Respectfully submitted,

*D.A. Davidson & Co. Fixed Income Capital Markets*

_____
Kyle Thomas
Managing Director

ACCEPTED this _____ day of _____ 2022.

_____
Authorized Officer
City of Fort Lupton

EXHIBIT A

D.A. Davidson & Co. (hereinafter referred to as "Davidson" or "tender agent") intends/ proposes to serve as a tender agent, and not as a financial advisor or municipal advisor, in connection with the issuance of the Bonds.

As part of our services as tender agent/senior managing tender agent, Davidson may provide advice concerning the structure, timing, terms, and other similar matters concerning the issuance of the Bonds.

**Disclosures Concerning the Tender Agents Role:**

(i) MSRB Rule G-17 requires a tender agent to deal fairly at all times with both municipal issuers and investors.

(ii) The tender agents' primary role is to purchase the Bonds with a view to distribution in an arm's-length transaction with the Issuer. The tender agents financial and other interests that may differ from those of the Issuer.

(iii) Unlike a municipal advisor, the tender agents do not have a fiduciary duty to the Issuer under the federal securities laws and are, therefore, not required by federal law to act in the best interests of the Issuer without regard to their own financial or other interests.

(iv) The Issuer may choose to engage the services of a municipal advisor with a fiduciary obligation to represent the Issuer's interest in this transaction

(v) The tender agents have a duty to purchase the Bonds from the Issuer at a fair and reasonable price, but must balance that duty with their duty to sell the Bonds to investors at prices that are fair and reasonable.

(vi) The tender agent will review the official statement for the Bonds in accordance with, and as part of, their respective responsibilities to investors under the federal securities laws, as applied to the facts and circumstances of this transaction.

**Disclosures Concerning the Tender Agents Compensation:**

As tender agent, Davidson will be compensated by a fee and/or an underwriting discount that will be set forth in the bond purchase agreement to be negotiated and entered into in connection with the issuance of the Bonds. Payment or receipt of the underwriting fee or discount will be contingent on the closing of the transaction and the amount of the fee or discount may be based, in whole or in part, on a percentage of the principal amount of the Bonds. While this form of compensation is customary in the municipal securities market, it presents a conflict of interest since the tender agent may have an incentive to recommend to the Issuer a transaction that is unnecessary or to recommend that the size of the transaction be larger than is necessary.

**Additional Conflicts Disclosure:**

Davidson has not identified any additional potential or actual material conflicts that require disclosure.

# CITY OF FORT LUPTON
# CITY COUNCIL

Zo Stieber, Mayor

Valerie Blackston, Ward 1
Chris Ceretto, Ward 2
Carlos Barron, Ward 3

David Crespin, Ward 1
Claud Hanes, Ward 2
Bruce Fitzgerald, Ward 3

**IM 2022-001**

**EXECUTION OF DESIGN SERVICES AGREEMENT WITH DHM DESIGN FOR MASTER PLAN OF SPLASH PAD**

I. Agenda Date: Council Meeting – February 1, 2022

II. Attachments: b. Design Services Agreement.

III. Detail of Issue/Request:

DHM Design has presented the City with a proposal to provide a preliminary master plan for a proposed splash pad feature at the south end of the Recreation Center facilities. Deliverables to the City would include a base map of the selected site area, master plan graphic of the proposed features and preliminary cost estimates.

Upon completion of this contract, the City will use the prepared documentation to solicit full design and bid documents with an RFQ (Request For Qualifications) for professional design services. The final steps will be issuing an RFP (Request For Proposal) for construction of the facilities.

IV. Legal/Political Considerations:

None.

V. Alternatives/Options:

A) Approve the agreement with DHM Design
B) Reject agreement and contract with another firm.
C) In house design

VI. Financial Considerations:

The 2022 general fund grounds department budget includes a capital expenditure of $400,000 for the splash pad. The $3,925 in this contract is the first step of the budged item.

VII. Submitted by: Monty Scheuman

Recreation Director

VII. Approved for Presentation:

City Administrator

**City of Fort Lupton, Colorado**

# Consultant Agreement

This Agreement is entered into by and between the **City of Fort Lupton**, Colorado (hereinafter "City") and **DHM DESIGN** (hereinafter "CONSULTANT").

WHEREAS, the parties hereto agree in consideration of the covenants, payments and agreements set forth herein as follows:

1. **SCOPE OF WORK.** Consultant will furnish all tools, equipment, supplies, superintendence, insurance, transportation, labor and other accessories, services and facilities specified or required to complete the work. Consultant shall provide and perform all necessary labor in a first class and professional manner and in accordance with the conditions and prices stated in the bid proposal and the requirements, stipulations, provisions and conditions of the contract documents. Consultant shall perform, execute, and complete all things mentioned to be done by the Consultant and all work included in the scope of work set forth and incorporated herein as **Exhibit A**. Consultant confirms it possesses all necessary professional licenses and is in good standing with the State of Colorado. Further, Consultant states it possesses professional liability.

2. **CONTRACT DOCUMENTS.** This Agreement consists of and includes this Agreement and the scope of work set forth in the Consultant's proposal attached hereto as **Exhibit A**. In the event of any conflict between any of these documents, this document shall control.

3. **TIME OF COMPLETION.** The Consultant agrees to commence work upon execution of this Agreement and to complete all work in an expeditious and timely manner to meet the prescribed Project schedule.

4. **CONTRACT SUM.** The City shall pay to the Consultant for performance and completion of the work encompassed by this Agreement, and the Consultant will accept as full compensation in accordance with the terms set forth in **Exhibit A**, subject to confirmation by the City of completion of the scope of work in accordance with the contract documents attached hereto. Said amounts to be paid upon review and acceptance of the work by the City, in its sole discretion.

5. **CONTRACT APPROPRIATIONS/NO CHANGE ORDERS.** The City states that the amount of money appropriated for this Agreement is equal to or in excess of the contract amount. No change order to this Agreement requiring additional compensable work to be performed, which work causes the aggregate amount payable under this Agreement to exceed the amount appropriated for the original contract shall be issued by the City unless the City notifies the Consultant in writing, that lawful appropriations to cover the costs of this additional work has been made and the change order is approved by the City in its sole discretion in writing.

6. **AMENDMENT/NO ASSIGNMENT.** No modification or amendment of this Agreement shall be valid unless in writing and signed by all parties to this Agreement.

7. **COMPLETE AGREEMENT.** This Agreement, and the exhibits hereto, shall constitute the entire agreement between the parties with respect to the subject matter hereof and there are no agreements, representations or warranties other than as set forth herein.

8. **SEVERABILITY.** In the event any portion of this Agreement is held to be unenforceable, the unenforceable portion of this Agreement will be deleted and the remaining provisions of the Agreement shall continue in full force and effect.

9. **GOVERNING LAW.** This Agreement shall be governed by the laws of the State of Colorado. All parties agree that any dispute regarding enforcement of this Agreement shall be filed in Weld County District Court after first attempting in good faith to submit the dispute to mediation. Submission of any dispute to mediation shall be a condition precedent to filing litigation in this matter, other than the request for injunctive relief.

10. **OSHA REQUIREMENTS.** Consultant agrees that it alone bears the responsibility for providing a safe and healthy work environment and shall provide its employees with adequate orientation and training to safely perform the scope of work set forth in this contract. Consultant shall at all times comply with the safety and health regulations of the Occupational Safety and Health Act of 1970 (29 CFR 1926) including all amendments and modifications thereto. In the event there is a conflict between the safety and health provisions of federal, state or local regulations, the more stringent provision shall prevail.

11. **NO WAIVER OF GOVERNMENTAL IMMUNITY.** The City, its elected officials, officers and employees are relying upon, and do not waive or intent to waive by any provision of this Agreement, the monetary limitations or any other rights, immunities and protections provided by the Colorado Governmental Immunity Act, C.R.S. Sec. 24-10-101 et seq. as amended or otherwise available to the City. Nothing herein shall operate as a waiver of any right the City has of governmental immunity under Colorado law which is specifically herein reserved.

12. **INDEPENDENT CONTRACTOR.** Contractor is a separate, legal entity from the City and the parties make this Agreement accordingly with the understanding that Contractor at all times is acting as an independent contractor and not an employee or agent of the City. All persons retained by Contractor to perform services pursuant to this Agreement shall be employees or independent contractors of Contractor and are not employees, contractors or agents of the City. Contractor does not have the authority to bind the City by contract or otherwise

13. **FORCE MAJEURE.** Neither party shall be liable or responsible to the other party nor be deemed to have defaulted under or breached this Agreement for failure or delay in fulfilling or performing any obligation under this Agreement when such failure or delay is caused by or results from causes beyond the reasonable control of the affected party, including but not limited to fire, floods, embargoes, pandemics, wars, acts of war (whether war is declared or not), insurrections, riots, civil commotions, strikes, lockouts or other labor disturbances, instances affecting public health including

pandemics, acts of God or acts, omission, or delays in acting by any governmental authority. Provided, however, that the party so affected shall use reasonable efforts to avoid or remove such causes of non-performance, and shall continue performance hereunder with reasonable dispatch whenever such causes are removed. Either party shall provide the other party with prompt written notice of any delay or failure to perform that occurs by reason of force majeure. The parties shall mutually seek a resolution of the delay or the failure to perform as noted above.

14. **INDEMNIFICATION BY CONSULTANT.** Consultant shall defend, indemnify and hold the City harmless from any damages, including but not limited to any loss, liability, expenses, suit or claim, or claim for injury to persons or damage to property arising out of the activities of Consultant or its subconsultants pursuant to this Agreement. Expenses shall include all out of pocket expenses, attorney fees, expert costs and related litigation fees.

EXECUTED THIS _____ DAY OF **January, 2022**.

**CITY OF FORT LUPTON, COLORADO**

_____

BY: Monty Schuman

TITLE: Recreation Director

**DHM Design:**

_____

BY: _____

TITLE: _____

# DHM DESIGN

LANDSCAPE ARCHITECTURE | LAND PLANNING | ECOLOGICAL PLANNING | URBAN DESIGN

January 20, 2022

Doug Cook
Recreation Manager
City of Fort Lupton
203 South Harrison Ave.
Fort Lupton, CO. 80621

**RE: Fort Lupton Recreation Center Splashpad – Master Plan**

Mr. Cook:
As requested, please review our proposal for Landscape Architectural Design Services for Master Planning of the Fort Lupton Recreation Center Splash Pad. Based on our conversation on 01.19.2022, DHM Design has prepared the following scope of work and schedule of professional fees:

Respectfully,
DHM Design Corporation

**Matthew Whipple – NRPA**
Principal

## PROJECT UNDERSTANDING:

We understand that the site is located at 203 S Harrison Ave, Fort Lupton. Currently, the site of the future splashpad is relatively unutilized. Conditions on site are fairly flat with several necessary utilities in the general area. Existing shade structures, playground and crusher fines trails are located in the immediate area. To the east, the existing maintenance building is situated between a proposed sanitary line connection. Water and electrical connections would likely be stemmed from this maintenance facility. Storm sewer connection is unknown at this time. Most of the surfacing throughout the area consists of bluegrass sod, crusher fines trails, EWF in the playground area and adjacent asphalt parking. We are also aware that there are conversations in progress with AT&T regarding their needs for future cell tower infrastructure (small building or expanded equipment area with access).

Process: This proposal is for an abbreviated master planning process only. We anticipate a meet with City Staff on site to review existing conditions and discussion of future improvements in the area. Improvement discussed to date include the following but is not limited to: Spashpad, maintenance structure, restroom/concession, realignment of trails for improved connectivity to/from the splashpad, shade structure(s), landscape material, and irrigation adjustment. Following this meeting of future improvements, DHM staff would prepare a preliminary master plan of the area with placement & alignment of all future improvements discussed. Upon completion of the preliminary master plan, DHM staff would meet with City Staff to review and make minor edits as necessary prior to submitting a final master plan. Typical full master planning process (public meetings, website, multiple concepts, coordination with outside agencies, etc.) is not included. As discussed, this master plan is more for general placement of future improvements to ensure forward progress is made and to assist with garnering public interest.

Survey Services: As part of the abbreviated master planning process, we would fly the site utilizing drones to gather current existing conditions of the area. This base mapping would be used as the bases of the master plan.

# DHM DESIGN

## PROJECT SCOPE:

**Project Area Master Plan:**

- Schematic Design of Project Area
    - Meeting #1: Attend kick-off meeting with City Staff to review project area and discussion of future improvements
    - Produce and provide hand rendered master plan for review based on discussion at Meeting #1
        - Provide abbreviated Opinion of Estimated Costs for the Master Plan
    - Meeting #2: (1) meeting with City Staff to review and receive comments regarding the schematic design

**Notes:**

- For the master planning process, we do not anticipate sub-consultant services. Our team would coordinate with Michelle Lynn (Vortex Splashpad) for splashpad information.

## PROJECT DELIVERABLES:

DHM Design will provide full-size PDF Master Plans for review and comment.

- Drone basemap of site – PDF
- Meeting #1 – Meeting notes – PDF
- Preliminary Master Plan Graphic - PDF
- Meeting #2 – Meeting notes – PDF
- Final Master Plan Graphic - PDF

## PROFESSIONAL FEES:

| Task | Hours | Cost |
|---|---|---|
| Drone base mapping | 2 | $350.00 |
| Meeting #1 – Meeting and travel time | 2 | $350.00 |
| Preliminary Master Plan Graphic | 8 | $1,400.00 |
| Meeting #2 – Meeting and travel time | 2 | $350.00 |
| Final Master Plan Graphic | 6 | $1,050.00 |
| Expenses: | | $125.00 |
| | **Total:** | **$3,625** |

## SCHEDULE AND STAFF:

DHM Design is available to begin this project immediately

**DHM Design Staff:**

Matthew Whipple – Principal, Project Manager, Design Lead – Point of Contact
Kyle Davis – Landscape Architect

If you find the general scope and fee allowance presented in this proposal acceptable, please sign and return as our authorization to proceed immediately.

Approved by:

Signature: _____

Name: _____ Date: _____

# CITY OF FORT LUPTON
# CITY COUNCIL

Zo Stieber, Mayor

Valerie Blackston, Ward 1
Chris Ceretto, Ward 2
Carlos Barron, Ward 3

David Crespin, Ward 1
Claud Hanes, Ward 2
Bruce Fitzgerald, Ward 3

**IM 2022-002**

**AFFIDAVIT FOR SURRENDER OF STATE LIQUOR LICENSE FOR SBM TRAVEL STOP COLORADO LLC DBA TJ'S EXPRESS AT 804 DENVER AVENUE**

I. Agenda Date: Council Meeting – February 1, 2022

II. Attachments: b. Affidavit of Surrender

III. Detail of Issue/Request:

On January 18, 2022, SBM Travel Stop Colorado LLC dba TJ's Express at 804 Denver Ave. submitted an affidavit for surrender of their Fermented Malt Beverage ("FMB") license. According to the owner's attorney, TJ's would be out of inventory by January 23, 2022.

IV. Legal/Political Considerations:

V. Alternatives/Options:
N/A

VI. Financial Considerations:
N/A

VII. Submitted by:

Mari Peña, City Clerk

VII. Approved for Presentation:

City Administrator

**BEFORE THE STATE LICENSING AUTHORITY**
**DEPARTMENT OF REVENUE**
**STATE OF COLORADO**

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**AFFIDAVIT FOR SURRENDER OF STATE LIQUOR LICENSE**

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**IN THE MATTER OF:**

LICENSEE: SBM Travel Stop Colorado LLC

TRADE NAME: TJ's Express

ADDRESS: 804 Denver Avenue

CITY: Ft. Lupton STATE: CO ZIP CODE: 80621

TELEPHONE: (303) 857-4343 EMAIL: somuarya1@hotmail.com

LICENSE NO: 04-00918

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I, Manjit Singh, an authorized representative of the above-named Licensee hereby voluntarily surrender the Colorado state liquor license and all related licensing privileges. Licensee hereby requests the Liquor Enforcement Division ("Division") of the Colorado Department of Revenue, on behalf of the State Liquor Licensing Authority, to immediately cancel, terminate, and void Licensee's Colorado state liquor license.

Licensee states that this surrender of Licensee's Colorado state liquor license and licensing privileges is made voluntarily by the Licensee, and that Licensee is not surrendering the aforesaid liquor license(s) and privileges as the result of any threat, promise, or coercion by the Division or any of its agents or employees.

Licensee further acknowledges:

- This surrender does not violate any requirements of a Forcible Entry and Detainer (FED) order, or Writ of Restitution requiring the licensee to dispossess the licensed premises.
- That an application to transfer this liquor license has not been filed with the local licensing authority.
- This is not an attempt to avoid prosecution of a violation of the Colorado Liquor Code and that the Division may refuse to accept this affidavit of surrender until after any pending administrative action is complete.
- The Licensee's privileges will be canceled, terminated, and voided upon the issuance of an order by the Director of the Division accepting this voluntary surrender of licenses.

I affirm under penalty of perjury, I am authorized to surrender this license on behalf of the aforementioned Licensee.

Name Manjit Singh Signature Manjit Singh

Title Member Date 1/17/22

**Upcoming Events**

| | |
|---|---|
| February 8, 2022 | Town Hall Meeting, 130 S. McKinley Ave. 6:30 p.m. |
| February 15, 2022 | City Council Meeting, 130 S. McKinley Ave. 7:00 p.m. |
| February 21, 2022 | City Hall closed in Observance of President's Day |
| February 22, 2022 | Town Hall Meeting, 130 S. McKinley Ave. 6:30 p.m. |
| March 1, 2022 | City Council Meeting, 130 S. McKinley Ave. 7:00 p.m. |