

PLANNING COMMISSION

Mike Simone, Chairperson
Bushrod White, Vice-Chairperson
Carlos Barron
Lynne Derby
Kathy Kvasnicka
Thomas Meyers
Paul Weber

**Planning Commission Agenda
Regular Meeting
Virtual Meeting via GoToMeeting*
Thursday, April 8, 2021
6:00 P.M.**

(Order & Contents Subject to Change by Action of the Commission)

**This meeting will be held virtually only.
Login information on how to attend this virtual meeting is on the second page of this Agenda.*

Call to Order – Roll Call

Approval of Agenda

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 Commission member so requests, in which case the item may be removed from the Consent Agenda and considered at the end of the Consent Agenda.

- a. Approval of the Minutes of the March 25, 2021 Meeting

Public Comment – This portion of the Agenda is provided to allow members of the audience to present comments to the Planning Commission related to items not otherwise listed on the Agenda.

Action Items

- a. **P2021-010 Transwest Truck and Trailer Phase 3 Lot 1 Site Plan**
- b. **P2021-011 Transwest Truck and Trailer Phase 3 Lot 2 Site Plan**

Discussion Items

- a. Review of Meeting Discussion
- b. Development Code Update

Future Business

Adjourn

VIRTUAL MEETING LOG-IN INSTRUCTIONS

Please join my meeting from your computer, tablet or smartphone.

<https://global.gotomeeting.com/join/247460885>

You can also dial in using your phone.

United States (Toll Free): 1 877 309 2073

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Access Code: 247-460-885

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Virtual Meeting Instructions

If you would like to participate remotely, we encourage you to test the phone number and links provided above prior to the start of the meeting, as each device requires initial adjustment. It is also recommended to log into the meeting early, and if you encounter any issues to call 303-304-4498 or email PlanningDept@fortluptonco.gov immediately.

When calling in, please be sure to mute your microphone on your computer, phone or tablet. Planning staff and/or the Chairman of the Planning Commission will provide instructions on when and how comments can be made by the public virtually.

**RECORD OF PROCEEDINGS
FORT LUPTON PLANNING COMMISSION
March 25, 2021**

The Planning Commission of the City of Fort Lupton met in session virtually via GoToMeeting, on Thursday, March 25, 2021.

Vice-Chair Bushrod White called the meeting to order at 6:00 p.m.

ROLL CALL

Roll was taken and those present were Vice-Chair Bushrod White and Commission Members Carlos Barron, Kathy Kvasnicka, Lynne Derby and Paul Weber. Also in attendance were Planning Director Todd Hodges, City Planner II Alyssa Knutson, City Planner I Maria Lancto, and Planning Administrative Assistant Magaly Morales-Tejada.

Planner Alyssa Knutson gave the following advisement on behalf of the commission:

Tonight's meeting shall be held virtually so as to ensure the health and safety of the general public and the City of Fort Lupton Planning Commission and staff.

The intent and purpose of the virtual appearance options 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. Therefore, subject to social distancing and public health orders, members of the general public will be offered the opportunity to be electronically present for meetings at the City, subject to existing health conditions.

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

Planning Director Todd Hodges requested that items B and C be moved to the top of the agenda.

Vice-Chair White called for a motion to move items B and C to the top of the agenda. It was moved by Carlos Barron and seconded by Lynne Derby to approve the agenda as amended. Motion passed unanimously.

CONSENT AGENDA

Vice-Chair White called for a motion to approve the consent agenda. It was moved by Paul Weber and seconded by Kathy Kvasnicka. Motion passed unanimously.

**RECORD OF PROCEEDINGS
FORT LUPTON PLANNING COMMISSION
March 25, 2021**

PUBLIC COMMENT

Vice-Chair White asked if there was anyone who would like to comment on an item not on the agenda tonight. Hearing none, he closed Public Comment.

ACTION ITEMS

P2021-010 Hagler Annexation Nos.1-5 and Initial Zoning and P2021-011 Hagler Special Use Permit

Planning Director Todd Hodges stated that the applicants have submitted a letter of withdrawal for the Hagler Annexation Nos.1-5, Initial Zoning and Special Use Permit. He stated that this withdrawal did not require further action or discussion in order to be effective.

P2021-009: United Fulton Augmentation Station Project Special Use Permit

Planner Alyssa Knutson presented this action item. She stated that the project was for a proposed below-grade pipeline for augmentation from the Fulton Ditch to South Platte River. She stated this application was submitted by United Water and Sanitation District. Ms. Knutson stated that the project runs through both city and county parcels and this special use permit is for the seven parcels within the City. She stated that the zoning for these parcels range from I-1 Industrial, "A" Agriculture or I-2 Heavy Industrial. She stated that these zoning classifications do not permit public utility facilities or similar uses as a use by right, but it is listed as a special use permit with approval from Planning Commission and City Council. Ms. Knutson stated that the requirements for this special use permit are consistent with several other similar special use permits brought before Planning Commission and City Council, such as the previously approved Lupton Lakes Pipeline and the Pioneer Water Pipeline. She stated that the applicants were available with a brief presentation.

The applicant Andrew Damiano, with United Water and Sanitation District gave the presentation. Mr. Damiano explained that this project parallels the County Road 8 ½ alignment and parallels an existing utility corridor with an existing gas-line and water line. He stated that the purpose of this project was to divert raw water from the Fulton Ditch back to the South Platte River. Mr. Damiano stated that this is part of one of United Water's decrees and is subject to the State of Colorado. He stated that they have built a Fulton head-gate on Fulton and the project would consist of building a 30" pipeline from that head gate through these properties to an existing 18" inch bore underneath Highway 85, which would convey the water to the South Platte River. Mr. Damiano stated that this is a below grade gravity line with no pump stations or any above-grade structures. He stated that they are going through several zoning areas - Agriculture, I-1 and I-2. Mr. Damiano stated that the

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FORT LUPTON PLANNING COMMISSION
March 25, 2021

location of the easements is on the backside of large lots about a corridor length long and have obtained all easements necessary to cross the City of Fort Lupton. He stated that that they will return the properties to pre-construction conditions, they will reseed and reclaim and minimize the impact to the drainage pattern. He stated that there is no impact to future land development on these parcels. Mr. Damiano stated that after construction there will be no noise or dust coming from this project. He stated that there will also be no traffic impact, no lights or odors. Mr. Damiano stated that they are in the process of acquiring the necessary permits from Weld County. He stated that they have received referral comments from referral agencies that they will address. Mr. Damiano stated that this project satisfies the obligation to the State of Colorado to return water from the Fulton Ditch to the South Platte River.

Planner Alyssa Knutson on behalf of the commission addressed the applicant, Andrew Damiano. She asked if he understood that Members of the Planning Commission may be appearing tonight via virtual connection and may not be appearing in-person.

Mr. Damiano stated yes.

Planner Knutson asked if he consented to the applicable members voting on their submittal, even though said members are not present in person.

Mr. Damiano stated yes.

Planner Knutson asked if he understood that he had the right to continue this public hearing to such a date to allow a full in-person public hearing.

Mr. Damiano stated yes.

Planner Knutson asked if he voluntarily signed and submitted the written waiver and consent to proceed electronically tonight.

Mr. Damiano stated yes.

Planner Knutson asked if he waived his right to proceed in an in-person public hearing and have consented to proceed forward voluntarily tonight in this virtual planning commission meeting, is that correct.

Mr. Damiano stated yes.

Vice-Chair White opened up the public comment portion of the Hearing for the special use permit action item. Hearing no one from the public wishing to speak, Vice-Chair White closed the Public Hearing.

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FORT LUPTON PLANNING COMMISSION
March 25, 2021**

Planner Knutson asked Ms. Damiano if he felt he had a full and fair opportunity to participate in tonight's hearing.

Mr. Damiano stated yes

Vice-Chair White opened up the hearing to Planning Commissioners' comments and questions.

Member Paul Weber asked what the expected duration of construction is.

Mr. Damiano stated that they are expecting a 3-4 month duration, beginning in November as to minimize impact to the irrigation season.

Member Weber asked what impact this project would have on traffic.

Mr. Damiano stated that they are boring at Weld County Road 27, Rollie Ave. and under the railroad so there should be no traffic impact.

Member Carlos Barron asked what the reason to divert water back into South Platte River is.

Mr. Damiano stated that they (United Water and Sanitation) has an overall water system where they have to make up for depletions from a well field – he stated that this water goes back to the river to maintain depletions to downstream users.

Member Barron asked if there is any impact on people's access to Fulton Ditch's water.

Mr. Damiano stated no, he stated that they are only diverting their own water rights which would not impact Fulton. Mr. Damiano stated that Fulton Ditch is excited to move forward with this project and he foresees usage of this pipeline from others.

Vice-Chair White called for a motion to approve P2021-009. Kathy Kvasnicka motioned to approve and Paul Weber seconded. Motion passed unanimously.

DISCUSSION ITEMS

Review of Meeting Discussion

A review of meeting discussions took place.

Development Code Update

**RECORD OF PROCEEDINGS
FORT LUPTON PLANNING COMMISSION
March 25, 2021**

A discussion of the Development Code Update took place.

FUTURE BUSINESS

The next meeting of the Planning Commission is scheduled for April 8, 2021 at 6:00 PM.

ADJOURNMENT

Vice-Chair White adjourned the meeting at 6:29 PM.

Submitted by

Magaly Morales-Tejada, Planning Assistant

Approved by Planning Commission

Mike Simone, Chairperson

RESOLUTION NO. P2021-010

A RESOLUTION OF THE PLANNING COMMISSION OF FORT LUPTON RECOMMENDING TO CITY COUNCIL APPROVAL OF THE TRANSWEST TRUCK AND TRAILER PHASE 3 LOT 1 SITE PLAN FOR THE ADDITION OF A 30,550 SQUARE FOOT BUILDING ON A PROPERTY AT 13525 COUNTY ROAD 8 AND LOCATED IN THE SOUTHWEST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 17, TOWNSHIP 1 NORTH, RANGE 66 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF WELD, STATE OF COLORADO.

WHEREAS, the Planning Commission held a public hearing on April 8, 2021, for the purpose of reviewing GEP Investments, Inc.'s application for a site plan for the addition of a 30,550 square foot building to be used for the repair of auto transport trailers and units; and

WHEREAS, after review of the application and supporting information, the Planning Commission finds that the site plan conforms to Colorado Revised Statutes and City codes and policies therein, and

WHEREAS, all legal requirements for the public hearing have been met including publication of the legal notice in the Fort Lupton Press, mailing of public hearing notices to adjacent property owners within 100 feet, and posting of the hearing on the site.

NOW THEREFORE BE IT RESOLVED, the Planning Commission has taken into consideration all referral comments and any citizen testimony in response to this application. Based upon the facts presented on this date, the Planning Commission hereby recommends approval of the Transwest Truck and Trailer Phase 3 Lot 1 Site Plan, conditional upon the following:

- I. Prior to recording the site plan map:
 - A. The title of the map shall include Project No. LUP2021-0009& Plan No. SPR2021-0003.
 - B. Any redline comments provided by staff shall be made to the site plan map.
 - C. A set of Mylars of the Transwest Truck and Trailer Phase 3 Amended Plat shall be submitted for recording.
 - D. Applicant shall provide written evidence that the comments from United Power have been adequately addressed.
 - E. Applicant shall provide written evidence that the comments from the Public Works Director have been adequately addressed.

- F. Applicant shall dedicate by separate document a 20' wide water line easement per the direction of the Public Works Director.
- G. Applicant shall provide additional information regarding the traffic from the Phase 3 construction in a form acceptable to the Public Works Director for review and approval.
- H. Applicant shall submit a landscaping and/or screening plan for review and approval.
- I. The following notes shall be placed on the site plan map:
 - 1. Lighting on the site shall be maintained so that light is directed downwards and shall not spill onto adjacent properties.
 - 2. Dead and dying landscape material shall be replaced at the earliest reasonable date.
 - 3. The City reserves the right to reevaluate traffic impacts in the future if there is an increase from what was represented to the City in evaluating the site plan.
 - 4. The property shall be maintained to the curb, or roadway if no curb exists.
 - 5. Any proposed signage shall be submitted to the City for review and permitting.

II. Prior to the release of building permits:

- A. Applicant shall provide copy of SWMP and Stormwater Discharge permit from CDPH&E.

III. Prior to the release of a certificate of occupancy:

- A. A set of Mylars of the site plan map shall be submitted for recording.

DONE THIS 8th DAY OF APRIL, 2021, BY THE PLANNING COMMISSION FOR THE CITY OF FORT LUPTON, COLORADO.

Chairman

ATTEST:

Planning Director

**TRANSWEST TRUCK AND TRAILER PHASE 3 LOT 1 SITE PLAN
STAFF REPORT
PROJECT NO. LUP2021-0009 & PLAN NO. SPR2021-0003**

PROJECT DESCRIPTION

Project No.: LUP2021-0009 / Plan No.: SPR2021-0003

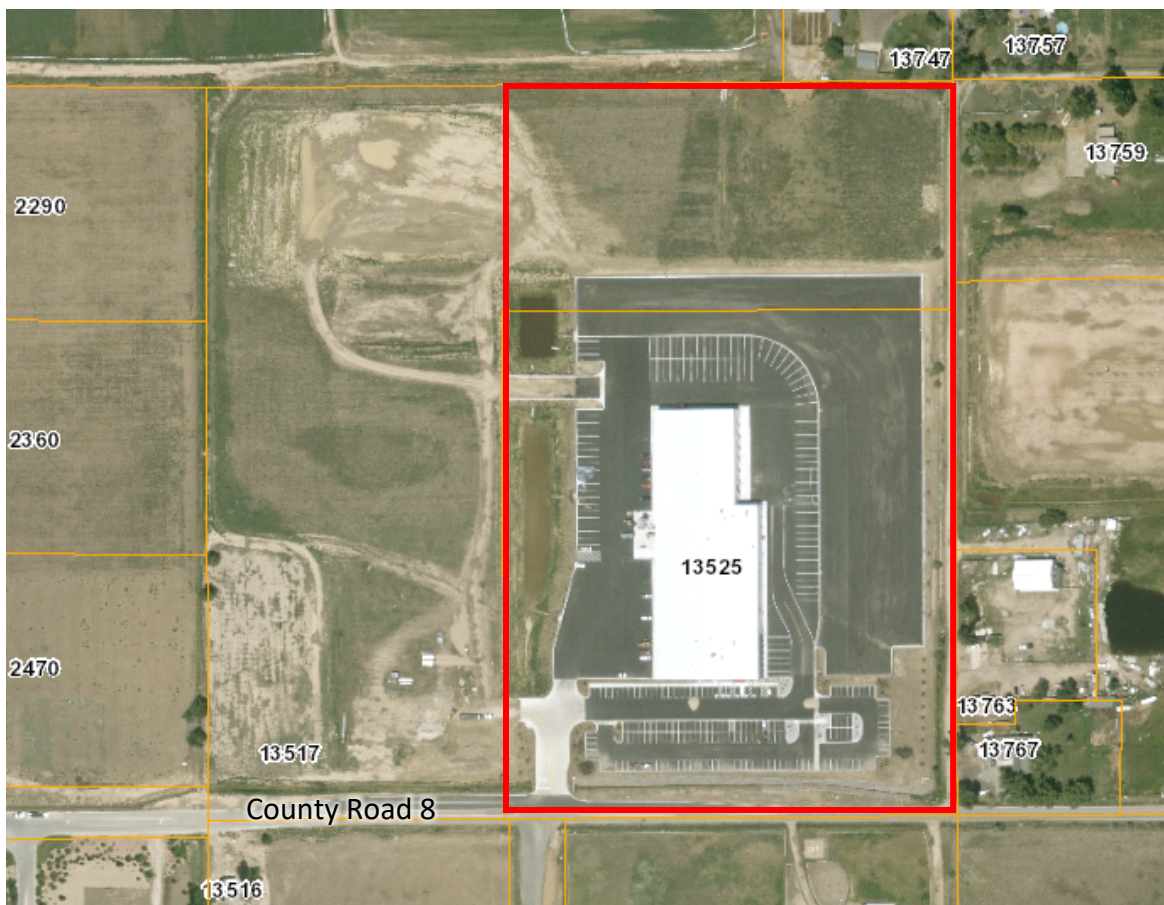
Project Name: Transwest Truck and Trailer Phase 3 Lot 1 Site Plan

Owner's Name: GEP Investments, Inc. ("Applicant")

Representative: Kyle Schmidt, GEP Investments Inc. ("Representative")

Location of Request:

The site that is the subject of this application is located at 13525 County Road 8 Fort Lupton, Colorado ("Property"). The Property is located in the Southwest Quarter of the Southeast Quarter of Section 17, Township 1 North, Range 66 West of the Sixth Principal Meridian, Fort Lupton, Colorado.



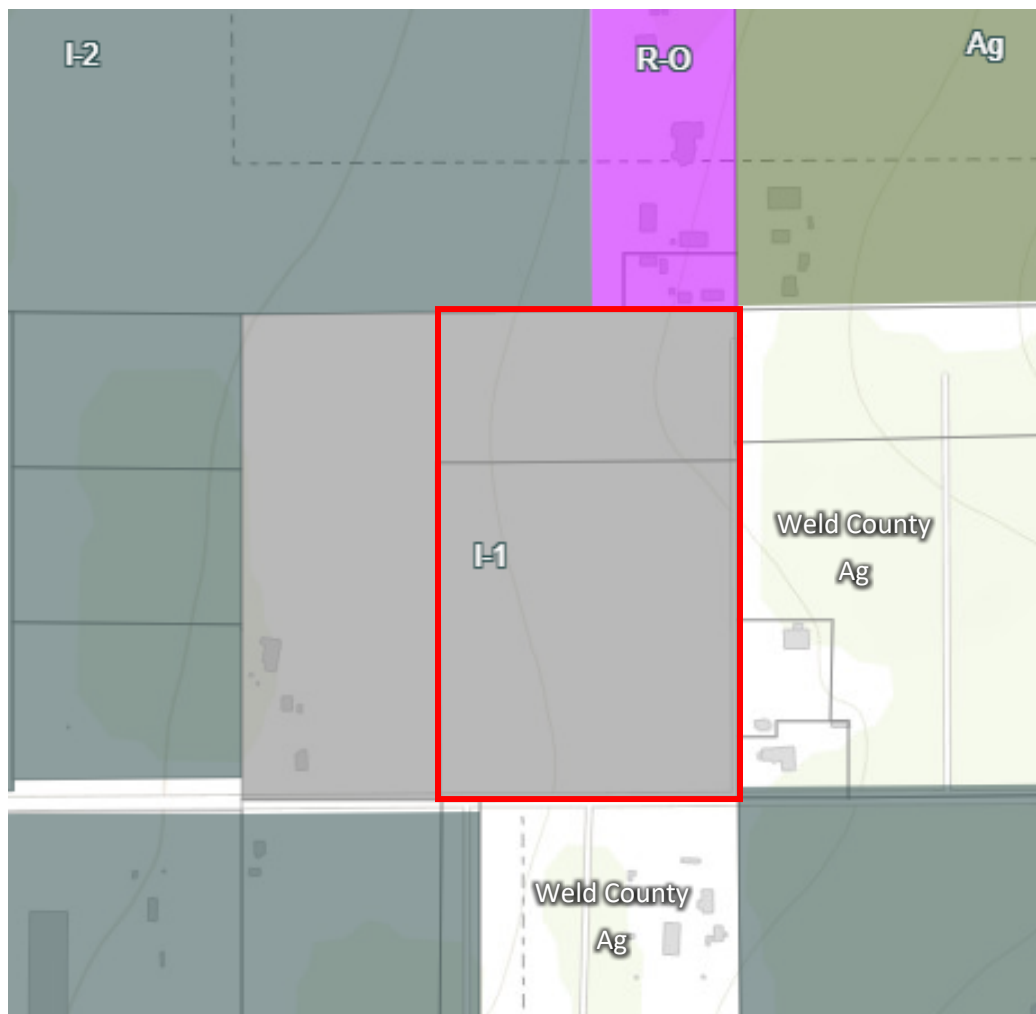
Nature of Request:

The Applicant has submitted a request for concurrent review of an amended plat and two site plans. Staff has conditionally approved the amended plat, and is recommending conditional approval of the site plans.

The Transwest Truck and Trailer Phase 3 Lot 1 Site plan is for the easternmost lot. Lot 1 currently contains a 78,700 square foot facility for assembly and manufacturing of components for specialty vehicles. The applicants are proposing the addition of a 30,550 square foot building in the northern portion of the lot. This facility will be used for the repair of auto transport trailers and units.

The new facility will operate between 7:00 AM and 5:00 PM, Monday through Friday. The number of employees is expected to be 20. There may be a small number of customers, however this facility is primarily providing internal services to the company.

The property is surrounded by Industrial and Agricultural zoning, as well as Residential-Office zoning to the north. Impact to the residential properties located north and northeast of this site will be mitigated through screening and landscaping.



Site Size: 23.096 acres, more or less.

Zone District: I-1 Light Industrial.

Proposed Use: Light industrial business that will be used for the repair of auto transport trailers and units in addition to continued use of the existing facility.

Existing Use: Light industrial business used for assembly and manufacturing of components for specialty vehicles. The northern portion of the lot is currently vacant.

Hearing Dates: Planning Commission – April 8, 2021 at 6:00 PM; and
City Council – April 20, 2021 at 7:00 PM

Hearing Location: Planning Commission: Held virtually via GoToMeeting due to COVID 19.
City Council: 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

The Property was annexed into Fort Lupton in 2006, and was initially zoned R-O Residential Office (the Routzen Annexation & Initial Zoning). The zoning was changed in 2016 to I-1 Light Industrial. In 2017, City Council approved a minor subdivision and site plan, known as the Transwest North Minor Subdivision and Summit Body Works Site Plan. In 2019, a site plan for lot 2 of the Transwest North Minor Subdivision was approved, which was amended administratively in 2020.

An amended plat was submitted for concurrent review with this site plan, which has been conditionally approved by staff.

APPLICATION PROCESS

The Applicant is requesting a site plan approval for a facility used for repair of auto transport trailers and units. The proposal includes an additional building, therefore requiring a site plan process. Pursuant to Section 16-170 of the Code, site plans are required as a step in the building permit review process for all multi-family, commercial or industrial development.

After required public notice of a site plan, 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 separately approve, approve with conditions or deny the site plan and special use permit. 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 site plan, referral agency comments, Planning Commission recommendation and any public testimony, and shall separately 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 Zoning Regulations require published notice of the hearings at least fifteen (15) days prior to the hearings. The Planning Commission and City Council hearings were published in the Fort Lupton Press on March 24, 2021.

Notice of the public hearings was posted on March 23, 2021 at the Property, which is at least fifteen (15) days prior to the hearings, as required by the Zoning Regulations.

Notice was mailed to neighbors within one-hundred (100) feet of the Property on March 22, 2021.

CONFORMANCE WITH CITY STANDARDS, REGULATIONS AND POLICIES

The property is located within the I-I Light Industrial Zone District. Manufacturing, fabrication, processing, distribution or assembly facilities are permitted in the I-1 Heavy Industrial Zone District; provided that all limitations of external effects required under these regulations are met. The use complies with the zoning for the Property, and conditions of approval will address any potential external effects.

CONFORMANCE WITH THE COMPREHENSIVE PLAN

The Fort Lupton Comprehensive Plan designates this area for industrial land uses. This designation allows for a mix of heavy and light industrial users as well as office development, intended to provide an appropriate environment for higher intensity users. These areas should be utilized to attract major employers and support economic development that will complement residential growth within the community. Developments within this designation should be carefully reviewed to account for potential impacts on adjacent land uses from high intensity operations. The proposed use conforms to this land use type.

REFERRALS

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

Buildings / Grounds Manager	Building Inspector	OMI
City Attorney	GIS Specialist	Police Chief
Public Works Director	Golf Course Manager	Finance Director
Fort Lupton Fire Protection District	CDOT	United Power
Comcast	CenturyLink	Xcel Energy
Weld County Department of Planning	Weld County Public Works	NCWCD
Fulton Ditch Company		

***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.***



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: GEP Investments, Inc.
 Company: Transwest Truck Trailer RV
 Phone: 303-301-7510 Email: geidsness@transwest.com
 Address: 20770 E. 176 Frontage Rd., Brighton, CO 80603
 Preferred method of contact? Email: _____ Phone: _____ Mail: _____
- 2) Representative Name: Kyle Schmidt
 Company: GEP Investments
 Phone: 303-301-7436 Email: kschmidt@transwest.com
 Address: 6045 Lipan Street, Denver, CO 80221
 Preferred method of contact? Email: _____ Phone: _____ Mail: _____
- 3) Billing Contact (where invoices should be directed to): Kyle Schmidt (same as above)
 Billing Company: _____
 Phone: _____ Email: _____
 Address: _____

B. SITE DESCRIPTION

Site Address: 13525 CR 8, Fort Lupton, CO
 Parcel Number: 147117401001
 Existing Zone Classification: I-1 Proposed Zone Classification: _____
 Water Type: Municipal Name: COFL
 Sewage Type: Municipal District Name or Location Hauled to: COFL

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: Transwest Truck & Trailer Phase 3

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

289ft x 130ft Metal Service Building (PEMB)

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:  Date: 2/3/21

Owner Certification

I hereby certify that I am the legal owner of record of the property that is the subject of this application. I 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:  Date: 2-3-21

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 <https://www.fortluptonco.gov/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@fortluptonco.gov.

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@fortluptonco.gov.



3/4/2021

Re: GEP Investments - Transwest Truck & Trailer Phase 3 – Project Description

This proposed building will be a Transwest facility for Auto Transport Sales and Service. The shops operating hours will be between 7am and 5pm, Monday through Friday. The number of employees is expected to be 20 at most and will consist mostly of service personnel and a few sales employees. This shop will mainly be repairing auto transport trailers and units. This operation involves working with internal and retail customers. The number of customers on a daily basis will be minimal as most of the operations at this facility are internal to the company.

PART OF THE SW1/4, SE1/4, SECTION 17, TOWNSHIP 1 NORTH, RANGE 66 WEST
PROJECT NO. _____ & PLAN NO. _____



GENERAL LEGEND

EXISTING FIRE HYDRANT
EXISTING WATER MAIN VALVE
EXISTING WATER MAIN
PROPOSED STORM INLETS
EXTERIOR LIGHT POLES
EXTERIOR LIGHT, BUILDING MOUNTED
PROPERTY LINE
EASEMENT EDGE

Title:	SITE PLAN
Project:	LOT 1, TRANSWEST NORTH MINOR SUBDIVISION—FIRST AMENDMENT, FORT LUPTON, CO.
For:	GEP INVESTMENTS, INC.

FOR
TRANSWEST TRUCK & TRAILER, PHASE 3
PART OF THE SW1/4, SE1/4, SECTION 17, T1N, R67W
CITY OF FORT LUPTON, COUNTY OF WELD, STATE OF COLORADO

GEP INVESTMENTS

1. ALL WORK SHALL CONFORM TO THE CITY OF FORT LUPTON'S MOST RECENT STANDARDS AND SPECIFICATIONS MANUAL GOVERNING THE CONSTRUCTION OF PUBLIC IMPROVEMENTS. A COPY SHALL REMAIN ON SITE FOR REFERENCE AT ALL TIMES.
2. THE CONTRACTOR SHALL CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO (UNCC) AT 1-800-922-1987, AT LEAST 2 WORKING DAYS PRIOR TO BEGINNING EXCAVATION OR GRADING, TO HAVE ALL REGISTERED UTILITY LOCATIONS MARKED. OTHER UNREGISTERED UTILITY ENTITIES ARE TO BE LOCATED BY CONTACTING THE RESPECTIVE REPRESENTATIVE. UTILITY SERVICE LATERALS ARE ALSO TO BE LOCATED PRIOR TO BEGINNING EXCAVATION OR GRADING.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL UTILITIES DURING CONSTRUCTION AND FOR COORDINATING WITH THE APPROPRIATE UTILITY COMPANY FOR ANY UTILITY CROSSINGS REQUIRED. REPAIR OF DAMAGED UTILITIES SHALL BE AT THE CONTRACTORS EXPENSE, INCLUDING UNKNOWN UNDERGROUND UTILITIES.
4. DURING CONSTRUCTION AND UPON COMPLETION OF CONSTRUCTION, THE SITE SHALL BE CLEANED AND RESTORED TO A CONDITION EQUAL TO, OR BETTER THAN, THAT WHICH EXISTED BEFORE CONSTRUCTION, OR TO THE GRADES AND CONDITION AS REQUIRED BY THESE PLANS.
5. THE CONTRACTOR SHALL CONFORM TO ALL SAFETY PRECAUTIONS DURING CONSTRUCTION AS SET FORTH BY BOTH OSHA PUBLICATION 2226 FOR EXCAVATING AND TRENCHING OPERATIONS, AND INCLUDING ALL STATE AND FEDERAL REGULATIONS SET FORTH IN DFR (CODE OF FEDERAL REGULATIONS) 29, ALL PARTS.
6. THE CONTRACTOR SHALL KEEP A COPY OF THE APPROVED SET OF PLANS, THE PROJECT MANUAL, AND THE FORT LUPTON STANDARDS AND SPECIFICATIONS MANUAL GOVERNING THE CONSTRUCTION AT PUBLIC IMPROVEMENTS.
7. EXISTING FENCES, TREES, SIDEWALKS, CURBS AND CUTTERS, LANDSCAPING, STRUCTURES, AND IMPROVEMENTS DESTROYED, DAMAGED OR REMOVED DUE TO CONSTRUCTION OF THIS PROJECT SHALL BE REPLACED OR RESTORED IN LIKE KIND AT THE CONTRACTOR'S EXPENSE, UNLESS OTHERWISE INDICATED ON THESE PLANS.
8. A COLORADO DEPARTMENT OF HEALTH CONSTRUCTION DEWATERING DISCHARGE PERMIT IS REQUIRED IF DEWATERING IS REQUIRED TO INSTALL UTILITIES AND WATER IS DISCHARGED INTO A STORM SEWER, CHANNEL, IRRIGATION DITCH OR ANY WATERS OF THE UNITED STATES.
9. ALL DISTURBED SOIL, ON-OR OFF SITE, AND RELATED TO WORK AT THIS PROJECT SITE, IS REQUIRED TO BE PROTECTED FROM WIND AND STORM WATER EROSION.
10. THE CONTRACTOR IS RESPONSIBLE FOR FIELD LOCATING AND VERIFYING ELEVATIONS OF ALL EXISTING SEWER MAINS, WATER MAINS, CURBS, GUTTERS AND OTHER UTILITIES AT THE POINTS OF CONNECTION SHOWN ON THE PLANS, AND AT ANY UTILITY CROSSINGS PRIOR TO INSTALLING ANY OF THE NEW IMPROVEMENTS. IF A CONFLICT EXISTS AND/OR A DESIGN MODIFICATION IS REQUIRED, THE CONTRACTOR SHALL COORDINATE WITH THE ENGINEER TO MODIFY THE DESIGN.
11. THE TYPE, SIZE, LOCATION AND NUMBER OF ALL KNOWN UNDERGROUND UTILITIES ARE APPROXIMATE WHEN SHOWN ON THE DRAWINGS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE EXISTENCE AND LOCATION OF ALL UNDERGROUND UTILITIES ALONG THE ROUTE OF WORK BEFORE COMMENCING NEW CONSTRUCTION.
12. ANY DISRUPTION OF UTILITY SERVICE THAT IS REQUIRED TO ADJUST, EXTEND, RELOCATE OR OTHERWISE MODIFY ANY UTILITY WITHIN THE PROJECT AREA SHALL BE COORDINATED IN ADVANCE WITH THE AFFECTED UTILITY ENTITY AND CUSTOMERS SHALL BE NOTIFIED 48 HOURS PRIOR TO THE START OF DISRUPTION.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING ALL OTHER APPLICABLE PERMITS NOT SPECIFICALLY REQUIRED BY THE CITY OF FORT LUPTON.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSURING THAT NO MUD OR DEBRIS SHALL BE TRACKED ONTO THE EXISTING PUBLIC STREET SYSTEM. MUD AND DEBRIS MUST BE REMOVED IMMEDIATELY BY AN APPROPRIATE METHOD (I.E. MACHINE BROOM SWEEP, LIGHT DUTY FRONT-END LOADER, HANDWORK, ETC.) AND THE INSPECTOR. THE FREQUENCY AND EFFORT OF STREET CLEANING OPERATIONS SHALL BE DIRECTLY RELATED TO THE AMOUNT OF CONSTRUCTION TRAFFIC AND WEATHER CONDITIONS. THE CONTRACTOR SHALL IMMEDIATELY ADDRESS ANY STREET CLEANING PROBLEMS IDENTIFIED BY THE CITY.
15. AFTER ACCEPTANCE BY THE CITY, PUBLIC IMPROVEMENTS DEPICTED IN THESE PLANS SHALL BE GUARANTEED TO BE FREE FROM MATERIAL AND WORKMANSHIP DEFECTS FOR A PERIOD OF TWO YEARS FROM THE DATE OF ACCEPTANCE.
16. CONSTRUCTION WORK SHALL NOT OCCUR BEFORE 7 AM OR AFTER 7 PM ON WEEKDAYS.
17. CONTRACTOR SHALL POTHOLE ALL EXISTING UTILITY CONFLICTS WITH PROPOSED UTILITIES AND IMPROVEMENTS WITHIN THE FIRST TWO WEEKS OF CONSTRUCTION THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ALL EXISTING UTILITY INFORMATION.

1. THE CONTRACTOR SHALL SUBMIT A TRAFFIC CONTROL PLAN PREPARED BY A LICENSED CIVIL ENGINEER A.T.S.S.A. (AMERICAN TRAFFIC SAFETY SERVICES ASSOCIATION) OF C.C.A. (COLORADO CONTRACTOR'S ASSOCIATION) CERTIFIED TRAFFIC TECHNICIAN FOR REVIEW AND APPROVAL BY THE CITY ENGINEER PRIOR TO COMMENCEMENT OF ANY WORK. TRAFFIC MAY BE STOPPED AN BOTH DIRECTIONS ONLY TO ALLOW CONSTRUCTION EQUIPMENT TO CROSS THE ROADWAY. TCS (TRAFFIC CONTROL SUPERVISOR) SHALL BE ON SITE AT ALL TIMES WHEN FLAG PERSONNEL ARE IN USE. UNSAFE TRAFFIC CONDITIONS AT THE CITY'S DISCRETION SHALL WARRANT WORK STOPPAGE.
2. WHEN AN EXISTING ASPHALT STREET MUST BE CUT, THE STREET MUST BE RESTORED TO A CONDITION EQUAL TO OR BETTER THAN ITS ORIGINAL CONDITION. THE EXISTING STREET CONDITION SHALL BE DOCUMENTED BY THE CITY BEFORE ANY CUTS ARE MADE. PATCHING SHALL BE DONE IN CONFORMANCE WITH THE CITY OF FORT LUTPON'S CURRENT STREET REPAIR REQUIREMENTS. PATCH SHALL BLEND SMOOTHLY INTO THE EXISTING SURFACE.
3. PRIOR TO PERMANENT INSTALLATION OF TRAFFIC STRIPING AND SYMBOLS, THE CONTRACTOR SHALL PLACE TEMPORARY TABS AND MARKINGS DEPICTING ALIGNMENT AND PLACEMENT OF THE SAME. TABS AND MARKINGS SHALL BE APPROVED BY THE CITY PRIOR TO PERMANENT INSTALLATION OF STRIPING AND SYMBOLS.
4. ALL PUBLIC STREET LANE STRIPING SHALL BE EPOXY PAINT, MINIMUM 15 MILS THICK WHEN DRY, AND HAVE A GLASS BEAD TO PAINT RATIO OF 25 LBS/GALLON. EPOXY PAINT SHALL BE APPLIED AT A MINIMUM RATE OF 1 GALLON/SQUARE FOOT.
5. ALL PUBLIC STREET SYMBOLS, INCLUDING ARROWS, ONLYS, CROSSWALKS, ETC. SHALL BE PRE-FORMED THERMO-PLASTIC (125 MILS THICK, MINIMUM). SURFACES SHALL BE THOROUGHLY CLEANED AND PREPARED PRIOR TO APPLICATION OF SYMBOLS.
6. ALL SIGNAGE SHALL BE PER THESE PLANS OR AS OTHERWISE SPECIFIED IN M.U.T.C.D. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLATION OF ALL SIGNS.
7. PRIOR TO PLACEMENT OF H.B.P. OR CONCRETE WITHIN THE STREET AND AFTER MOISTURE TESTS HAVE BEEN TAKEN ON THE SUBGRADE MATERIAL (WHEN A FULL DEPTH SECTION IS PROPOSED) OR ON THE SUBGRADE AND BASE MATERIAL (WHEN A COMPOSITE SECTION IS PROPOSED), A MECHANICAL "PROOF ROLL" WILL BE REQUIRED. THE ENTIRE SUBGRADE AND/OR BASE MATERIAL SHALL BE ROLLED WITH A HEAVILY LOADED VEHICLE HAVING A TOTAL GW OF NOT LESS THAN 50,000 LBS. AND A SINGLE AXLE WEIGHT OF AT LEAST 18,000 LBS. WITH PNEUMATIC TIRES INFLATED TO NOT LESS THAN 90 P.S.I. "PROOF ROLL" VEHICLES SHALL NOT TRAVEL AT SPEEDS GREATER THAN 3 M.P.H.. ANY PORTION OF THE SUBGRADE OR BASE MATERIAL WHICH EXHIBITS ANY PUMPING OR DEFORMATION, AS DETERMINED BY THE CITY OF FORT LUTPON, SHALL BE REMORKED, REPLACED OR OTHERWISE MODIFIED TO FORM A SMOOTH, NON-YIELDING SURFACE AT THE CONTRACTOR'S EXPENSE. THE CITY SHALL BE NOTIFIED AT LEAST 24 HOURS PRIOR TO THE "PROOF ROLL". ALL "PROOF ROLLS" SHALL BE PERFORMED IN THE PRESENCE OF AN INSPECTOR. ALL DECISIONS MADE BY THE INSPECTOR SHALL BE FINAL WITH REGARDS TO MITIGATION OF DEFICIENT SUBGRADE OR BASE MATERIALS. "PROOF ROLLS" ACCEPTABLE FOR 24 HOURS UNLESS HINDERED BY MOISTURE AT THE INSPECTORS DISCRETION.

1. PRIOR TO PERMANENT INSTALLATION OF TRAFFIC STRIPING AND SYMBOLS, THE CONTRACTOR SHALL PLACE TEMPORARY TABS AND MARKINGS DEPICTING ALIGNMENT AND PLACEMENT OF THE SAME. TABS AND MARKINGS SHALL BE APPROVED BY THE CITY PRIOR TO PERMANENT INSTALLATION OF STRIPING AND SYMBOLS.
2. PARKING LOT STRIPING SHALL BE PERMANENT LATEX OR ACRYLIC PAINT INTENDED FOR USAGE AND WEAR FOUND IN PARKING LOTS AND SHALL BE ON CDOT'S APPROVED MATERIALS LIST.
3. PARKING LOT SYMBOLS INCLUDING ARROWS, CROSSWALKS, HANDI-CAP PARKING, ETC. SHALL BE PRE-FORMED THERMO-PLASTIC (125 MILS THICK, MINIMUM), OR PERMANENT LATEX OR ACRYLIC PAINT FOUND ON CDOT'S APPROVED MATERIALS LIST.
4. ALL SIGNAGE SHALL BE PER THESE PLANS OR AS OTHERWISE SPECIFIED IN M.U.T.C.D. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLATION OF ALL SIGNS.
5. PRIOR TO PLACEMENT OF H.B.P. OR CONCRETE WITHIN THE STREET AND AFTER MOISTURE TESTS HAVE BEEN TAKEN ON THE SUBGRADE MATERIAL (WHEN A FULL DEPTH SECTION IS PROPOSED) OR ON THE SUBGRADE AND BASE MATERIAL (WHEN A COMPOSITE SECTION IS PROPOSED), A MECHANICAL "PROOF ROLL" WILL BE REQUIRED. THE ENTIRE SUBGRADE AND/OR BASE MATERIAL SHALL BE ROLLED WITH A HEAVILY LOADED VEHICLE HAVING A TOTAL GW OF NOT LESS THAN 50,000 LBS. AND A SINGLE AXLE WEIGHT OF AT LEAST 18,000 LBS. WITH PNEUMATIC TIRES INFLATED TO NOT LESS THAN 90 P.S.I.G. "PROOF ROLL" VEHICLES SHALL NOT TRAVEL AT SPEEDS GREATER THAN 3 M.P.H. ANY PORTION OF THE SUBGRADE OR BASE MATERIAL WHICH EXHIBITS ANY PUMPING OR DEFORMATION, AS DETERMINED BY THE CITY OF FORT LIPUTON, SHALL BE REMORKED, REPLACED OR OTHERWISE MODIFIED TO FORM A SMOOTH, NON-YIELDING SURFACE AT THE CONTRACTOR'S EXPENSE. THE CITY SHALL BE NOTIFIED AT LEAST 24 HOURS PRIOR TO THE "PROOF ROLL". ALL "PROOF ROLLS" SHALL BE PERFORMED IN THE PRESENCE OF AN INSPECTOR. ALL DECISIONS MADE BY THE INSPECTOR SHALL BE FINAL WITH REGARDS TO MITIGATION OF DEFICIENT SUBGRADE OR BASE MATERIALS. "PROOF ROLLS" ACCEPTABLE FOR 24 HOURS UNLESS HINDERED BY MOISTURE AT THE INSPECTOR'S DISCRETION.

1. ALL FILLS IN STREET RIGHT-OF-WAYS SHALL BE COMPACTED PER CITY OF FORT LUPTON'S SPECIFICATIONS. ALL EARTHWORK IN STREET RIGHTS-OF-WAYS SHALL COMPLY WITH CITY OF FORT LUPTON'S SPECIFICATIONS.
2. THE CONTRACTOR SHALL NOT TRACK MUD ONTO SIDE STREETS. IF MUD IS TRACKED OUTSIDE OF THE WORK AREA, THE CONTRACTOR SHALL HAVE ADEQUATE EQUIPMENT AND/OR PERSONNEL TO CLEAN UP THE MATERIAL AS SOON AS POSSIBLE.
3. THE CONSTRUCTION AREA SHALL BE WATERED AND MAINTAINED AT ALL TIMES DURING CONSTRUCTION ACTIVITIES SO AS TO PREVENT WIND-CAUSED EROSION AND DUST. ALL LAND DISTURBING ACTIVITIES SHALL BE IMMEDIATELY DISCONTINUED WHEN FUGITIVE DUST IMPACTS ADJACENT PROPERTIES, AS DETERMINED BY THE TOWN.
4. OWNER WILL PROVIDE A STORMWATER MANAGEMENT PLAN TO CONTRACTOR THAT MUST BE KEPT ON SITE AT ALL TIMES.
5. OWNER SHALL SECURE A STORMWATER DISCHARGE PERMIT FOR THE PROJECT.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL MAINTENANCE, REPAIR AND REPLACEMENT OF EROSION CONTROL DEVICES.
7. CONTRACTOR SHALL INSTALL ANY EROSION CONTROL DEVICE NECESSARY DUE TO CONSTRUCTION ACTIVITY WHETHER SHOWN ON THESE PLANS OR NOT.
8. CONTRACTOR SHALL KEEP A RECORD AND/OR MODIFY AND UPDATE THE STORMWATER MANAGEMENT PLAN KEPT ON SITE.
9. CONTRACTOR SHALL PERFORM REGULAR INSPECTIONS OF EROSION CONTROL DEVICES IN ACCORDANCE WITH THE DISCHARGE PERMIT.

3. ALL WATER LINE, WATER SERVICE, AND FIRE SERVICE IMPROVEMENTS SHOWN ON THESE PLANS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT CITY OF FORT LUPTON STANDARDS AND SPECIFICATIONS MANUAL GOVERNING THE CONSTRUCTION OF PUBLIC IMPROVEMENTS.
2. THE CONTRACTOR SHALL PROVIDE ALL WATER LINE, WATER SERVICE, AND FIRE SERVICE TESTING REQUIRED BY THE CITY OF FORT LUPTON AND IN ACCORDANCE WITH THE CURRENT CITY OF FORT LUPTON STANDARDS AND SPECIFICATIONS MANUAL GOVERNING THE CONSTRUCTION OF PUBLIC IMPROVEMENTS.
3. ALL WATER LINE CONSTRUCTION AND STREET REPAIR WORK SHALL CONFORM TO THE CITY OF FORT LUPTON'S STANDARDS AND SPECIFICATIONS MANUAL.
4. THE CONTRACTOR SHALL COORDINATE CONNECTION TO EXISTING WATER LINES WITH THE CITY PUBLIC WORKS DIRECTOR. UNLESS EXPRESSLY GIVEN PERMISSION OTHERWISE, ONLY THE CITY SHALL OPERATE EXISTING WATER VALVES OWNED BY THE CITY.
5. ALL NEW VALVES AND FITTINGS TO BE INSTALLED SHALL HAVE MECHANICAL JOINTS WITH JOINT RESTRAINTS AND SHALL BE WRAPPED WITH 8 MIL POLYETHYLENE. ALL NEW FITTINGS TO BE INSTALLED SHALL BE DUCTILE IRON FITTINGS AND SHALL BE WRAPPED WITH 8 MIL POLYETHYLENE.
6. ALL VALVES TO BE MECHANICALLY RESTRAINED OR INSTALLED WITH FOSTER ADAPTER COUPLINGS TO ELIMINATE THE NEED FOR LONG SPOOL PIPE PIECES BETWEEN FITTINGS AND VALVES.
7. ALL NEW PVC WATER LINES TO BE INSTALLED SHALL CONFORM TO AWWA C900 AND C905, DR25 165 PSI PRESSURE CLASS. ALL WATER LINES SHALL BE INSTALLED WITH TRACER WIRE OF A MINIMUM OF 14 GAUGE INSULATED WIRE.
8. ALL BACKFILL SHALL BE COMPACTED PER CITY OF FORT LUPTON'S REGULATIONS.
9. ALL WATER LINES SHALL BE INSTALLED WITH A MINIMUM COVER FROM FINISHED GRADE TO THE TOP OF PIPE OF 5 FEET. MAXIMUM COVER SHALL BE 6 FEET UNLESS OTHERWISE APPROVED BY THE CITY.
10. THE CONTRACTOR SHALL INSTALL BACKFLOW PREVENTION DEVICES ON ALL NEW DOMESTIC WATER SERVICE LINES AND FIRE SERVICE LINES ENTERING THE BUILDING, AND ACCORDING TO THE PLUMBING DRAWINGS.
11. THE CONTRACTOR SHALL INSTALL A BACKFLOW PREVENTION DEVICE ON ANY NEW IRRIGATION SERVICE THAT CONNECTS TO A CITY OF FORT LUPTON'S WATER MAIN, AND IN ACCORDANCE WITH THE IRRIGATION DRAWINGS.

1. ALL SANITARY SEWER IMPROVEMENTS SHOWN ON THESE PLANS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT CITY OF FORT LUPTON'S STANDARDS AND SPECIFICATIONS MANUAL GOVERNING THE CONSTRUCTION OF PUBLIC IMPROVEMENTS.
2. ALL SANITARY SEWER MATERIALS USED SHALL BE IN ACCORDANCE WITH THE CURRENT CITY OF FORT LUPTON'S STANDARDS AND SPECIFICATIONS MANUAL GOVERNING THE CONSTRUCTION OF PUBLIC IMPROVEMENTS.
3. THE CONTRACTOR SHALL PROVIDE ALL SANITARY SEWER LINE AND MANHOLE TESTING REQUIRED BY THE CITY OF FORT LUPTON AND IN ACCORDANCE WITH THE CURRENT CITY OF FORT LUPTON'S STANDARDS AND SPECIFICATIONS MANUAL GOVERNING THE CONSTRUCTION OF PUBLIC IMPROVEMENTS.
4. SANITARY SEWER SHALL BE POLYVINYL CHLORIDE (PVC) PIPE, ASTM D3034-SDR35 (OR AS INDICATED ON THE PLANS).
5. ALL CONCRETE SHALL BE MINIMUM 4000 PSI AT 28 DAY STRENGTH.
6. MAINTAIN A MINIMUM OF 10 FEET HORIZONTAL SEPARATION OUTSIDE DIAMETER TO OUTSIDE DIAMETER BETWEEN WATER LINES AND ALL SEWER LINES AND MANHOLES.
7. ALL SEWER MAINS CROSSING WATER MAINS WITH LESS THAN 18 INCHES OF SEPARATION SHALL BE ENCASED IN CONCRETE.
8. RIM ELEVATIONS SHOWN ARE APPROXIMATE AND SHOULD NOT BE TAKEN AS FINAL. ALL MANHOLES SHALL BE FINAL ADJUSTED AFTER PAVING SUCH THAT THE RIM IS 1/4 TO 1/2 INCH BELOW FINISHED ASPHALT. MANHOLES IN UNPAVED AREAS SHALL BE SET SO THAT THE RIM IS AT LEAST 6 INCHES ABOVE FINISHED GRADE.
9. THE CONTRACTOR SHALL HAVE A SET OF APPROVED PLANS ON SITE AT ALL TIMES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RECORDING ACTUAL RECORD DRAWING DIMENSIONS AND DISTANCES AS WELL AS SERVICE LOCATIONS ON THESE PLANS AND SUBMITTING THEM TO THE ENGINEER FOR PREPARATION OF RECORD DRAWINGS. THESE DRAWINGS SHALL BE KEPT CURRENT AT ALL TIMES.

1. CONTRACTOR SHALL OBTAIN A RIGHT-OF-WAY WORK PERMIT FROM THE CITY OF FORT LUPTON FOR ALL WORK WITHIN THE PUBLIC RIGHT-OF-WAY.
2. CONTRACTOR SHALL OBTAIN A GRADING PERMIT FROM THE CITY OF FORT LUPTON.
3. PERMIT IS REQUIRED THROUGH PUBLIC WORKS FOR WATER AND SEWER CONSTRUCTION.

1. THE CONTRACTOR SHALL USE THE CURRENT CITY OF FORT LUTPON'S CONSTRUCTION SPECIFICATIONS FOR PUBLIC IMPROVEMENTS SHOWN ON THESE PLANS. THE PROVIDED PROJECT SPECIFICATIONS INCLUDE CITY OF FORT LUTPON'S SPECIFICATIONS IN THEIR ORIGINAL FORMAT FOR WATER SYSTEM IMPROVEMENTS, SANITARY SEWER SYSTEM IMPROVEMENTS AND STORM SEWER IMPROVEMENTS.
2. PROJECT SPECIFICATIONS HAVE ALSO BEEN PROVIDED FOR THE REMAINING PORTIONS OF THE PROJECT, AND FOLLOW A MORE TRADITIONAL FORMAT.

1. BENCHMARK: PER NGS DATA SHEET FOR BM P391, DATED 1983, BENCHMARK IS IN NGS LOGO BOX AT 170± FEET NORTH OF WELD COUNTY ROAD 8 AND 35± FEET EAST OF EAST RAILROAD TRACK FOR THE UNION PACIFIC RAILROAD. ELEVATION IS 4941.38 NAVD 88 DATUM. T.B.M. IS TOP OF SOUTHEAST CORNER OF CONCRETE HEADWALL AT 214± FEET EAST AND 26± FEET NORTH OF THE SW CORNER OF SW1/4, SE1/4, T1N, R66W. ELEVATION IS 4953.46.
2. ALL MATERIALS AND CONSTRUCTION TO COMPLY WITH THE STANDARDS AND SPECIFICATIONS OF THE CITY OF FORT LUTPON.
3. THIS PLAN IS DESIGNED TO BE ELECTRONICALLY SCALED FOR MISSING DIMENSIONS.
4. PIPE LENGTHS ARE TO THE CENTER OF MANHOLES AND TO THE CENTER OF STORM INLETS. PIPE SLOPES ARE CALCULATED BASED ON THESE LENGTHS.
5. A MINIMUM DISTANCE BETWEEN WATER MAINS AND ALL OTHER UTILITIES IS 10 FEET AS MEASURED FROM PIPE CENTERLINE TO PIPE CENTERLINE.
6. THE MINIMUM COVER OVER WATER PIPES IS 4.5 FEET WHERE SHOWN ON THESE PLANS. THE MAXIMUM COVER OVER WATER PIPES IS AS SPECIFIED ON THESE PLANS.

For: GEP INVESTMENTS, INC.
Project: TRANSWEST TRUCK & TRAILER, PHASE 3
SITE PLAN

Job No: 16107-03
Sht: 3 of 21

Dwg No: CP33B107.DWG
Ver: 1" = 50'
Date: 2-15-21
Des: EJ
Dwg: EJ
Chk: EJ

Revision
By
Date

ED JENNINGS P.E., P.L.S.
CIVIL ENGINEER
P.O. BOX 200662 DENVER, CO. 80220-0662
(303)320-1987 phone
(303)320-1987 FAX
edjennings@comcast.net

50' 0' 50' 100'
1" = 50'
Bar Scale

FOR BURIED CABLE LOCATIONS
CALL U.N.C.C. 48 HOURS BEFORE DIGGING
1-800-922-1987

SEAL
ED JENNINGS P.E.
16107-03
CIVIL ENGINEER
STATE OF COLORADO

1. BENCHMARK: PER NGS DATA SHEET FOR BM P391, DATED 1983. BENCHMARK IS IN NGS LOGO BOX AT 170± FEET NORTH OF WELD COUNTY ROAD 8 AND 33± FEET EAST OF EAST RAILROAD TRACK. ELEVATION IN PACIFIC RAILROAD ELEVATION IS 4941.38 NAVD 88 DATUM. T.B.M. IS TOP OF SOUTHEAST CORNER OF CONCRETE HEADWALL AT 214± FEET EAST AND 264± FEET NORTH OF THE SW CORNER OF SW1/4, SE1/4, T1N, R66W. ELEVATION IS 4953.46.

2. ALL MATERIALS AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS OF THE CITY OF FORT LUPTON.

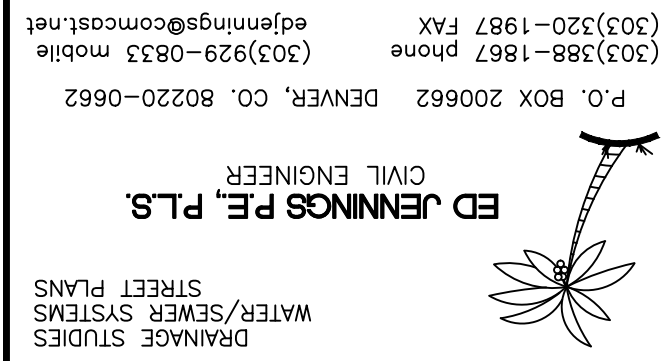
3. THIS PLAN IS DESIGNED TO BE ELECTRONICALLY SCALED FOR MISSING DIMENSIONS.

4. REFER TO ARCHITECTURAL PLANS FOR LATEST REVISION TO BUILDING PLANS.

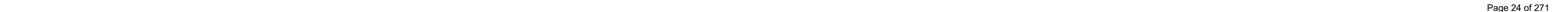
LEGEND

- CONCRETE
- RECYCLED ASPHALT
- ASPHALT

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RETENTION POND SUMMARY TABLE	
	LOT 1 POND
100 YR VOLUME (CU FT)	172,741
SURFACE ELEVATION	56.20
MAXIMUM DEPTH (FT)	8.20
TOP OF BERM	58.0





1. BENCHMARK: PER NGS DATA SHEET FOR BM P391, DATED 1983. BENCHMARK IS IN NGS LOGO BOX AT 170± FEET NORTH OF WELD COUNTY ROAD 8 AND 35± FEET EAST OF EAST RAILROAD TRACK FOR THE UNION PACIFIC RAILROAD. ELEVATION IS 4941.38 NAVD 88 DATUM. T.B.M. IS TOP OF SOUTHEAST CORNER OF CONCRETE HEADWALL AT 214± FEET EAST AND 26± FEET NORTH OF THE SW CORNER OF SW1/4, SE1/4, T1N, R66W. ELEVATION IS 4953.46.
2. ALL MATERIALS AND CONSTRUCTION TO COMPLY WITH THE STANDARDS AND SPECIFICATIONS OF THE CITY OF FORT LUTON.
3. THIS PLAN IS DESIGNED TO BE ELECTRONICALLY SCALED FOR MISSING DIMENSIONS.
4. REFER TO SHEET 21 FOR EROSION CONTROL DETAILS.

- SURFACE MATERIAL LEGEND
- | | |
|---|-------------------|
|  | RECYCLED ASPHALT |
|  | ASPHALT PAVEMENT |
|  | CONCRETE PAVEMENT |

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1-800-922-1987

BEFORE YOU DIG

50' = 1" Bar Scale

FOR THE CITY OF FORT LUPTON
COMPLETION DATE 12-15-21
DRAWN BY [Signature]
CHECKED BY [Signature]
DATE 12-15-21

Revision

Date

By

Project: TRANSWEST TRUCK & TRAILER, PHASE 3
FORT LUPTON, COLORADO

Sanitary Sewer Plan and Profile

Job No: 16107-03
Dwg No: CP43B107.DWG
Sht: 13 of 21

For: GEP INVESTMENTS, INC

Chk: EJ
Dwg: EJ
Des: EJ
Date: 2-15-21
Ver:
Hor: 1" = 50'
Job No: 16107-03
Dwg No: CP43B107.DWG
Sht: 13 of 21

NOTES:

1. BENCHMARK: PER NCS DATA SHEET FOR BM P391, DATED 1983. BENCHMARK IS IN NCS LOGBOOK AS 1704 FEET FROM THE INTERSECTION OF THE PACIFIC RAILROAD AND THE EAST RAILROAD TRACK FOR THE UNION PACIFIC RAILROAD. ELEVATION IS 2941.38 NAVD 88 DATUM. T.B.M. IS TOP OF SOUTHEAST CORNER OF CONCRETE HEADWALL AT 214± FEET EAST AND 26± FEET NORTH OF THE SW CORNER OF SW1/4, SE1/4, T1N, R66W. ELEVATION IS 4953.46.

2. ALL MATERIALS AND CONSTRUCTION TO COMPLY WITH THE STANDARDS AND SPECIFICATIONS OF THE CITY OF FORT LUPTON.

3. THIS PLAN IS DESIGNED TO BE ELECTRONICALLY SCALED FOR MISSING DIMENSIONS.

4. THERE ARE EXISTING UNDERGROUND UTILITIES WITHIN THE STREET RIGHTS-OF-WAY AND PREVIOUSLY DEVELOPED SITES THAT ARE NOT SHOWN ON THIS PLAN. CONTRACTOR SHALL HAVE EXISTING UNDERGROUND UTILITIES LOCATED PRIOR TO COMMENCING ANY EXCAVATION.

5. ANADARKO PETROLEUM MUST BE NOTIFIED AT LEAST 48 HOURS BEFORE ANY GRADING ACTIVITIES OVER THEIR GAS MAIN.

6. SANITARY SEWER LIFT STATIONS TO BE DESIGNED BY OTHERS.

7. LOCATIONS AND ELEVATIONS OF EXISTING IMPROVEMENTS ARE BASED UPON PREVIOUS DESIGNS UNLESS OTHERWISE NOTED. CONTRACTOR SHALL VERIFY LOCATIONS AND ELEVATIONS OF EXISTING IMPROVEMENTS PRIOR TO COMMENCING CONSTRUCTION. DIMENSIONS OF SAND/OIL INTERCEPTORS ARE FOR JENSEN INTERCEPTORS. MANHOLE TOP SECTIONS MAY BE REQUIRED TO BE INSTALLED FOR ACCESS.

8. PIPE LENGTHS SHOWN ARE MEASURED FROM MANHOLE CENTERS.

LEGEND

INV

INVERT

TOC

TOP OF CURB

PROPOSED STORM SEWER

WH3-1

PROPOSED MANHOLE

WH3-3

PROPOSED INLET

CO

PROPOSED CLEANOUT

PROPOSED SAND/OIL INTERCEPTOR

PROPOSED SAND/OIL INTERCEPTOR

EXISTING WATER MAIN

EXISTING WATER MAIN

FH

FIRE HYDRANT

GATE VALVE

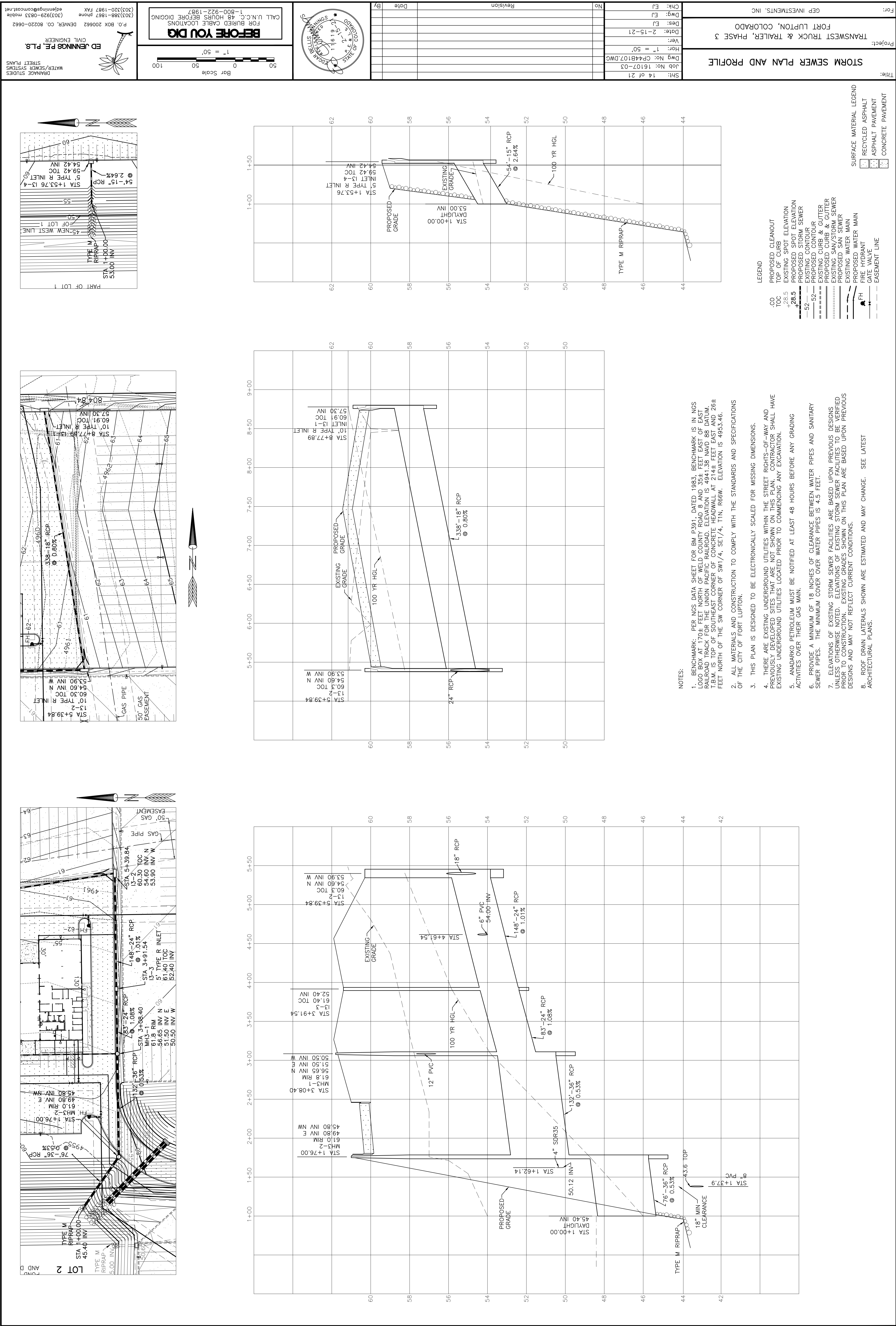
SURFACE MATERIAL LEGEND

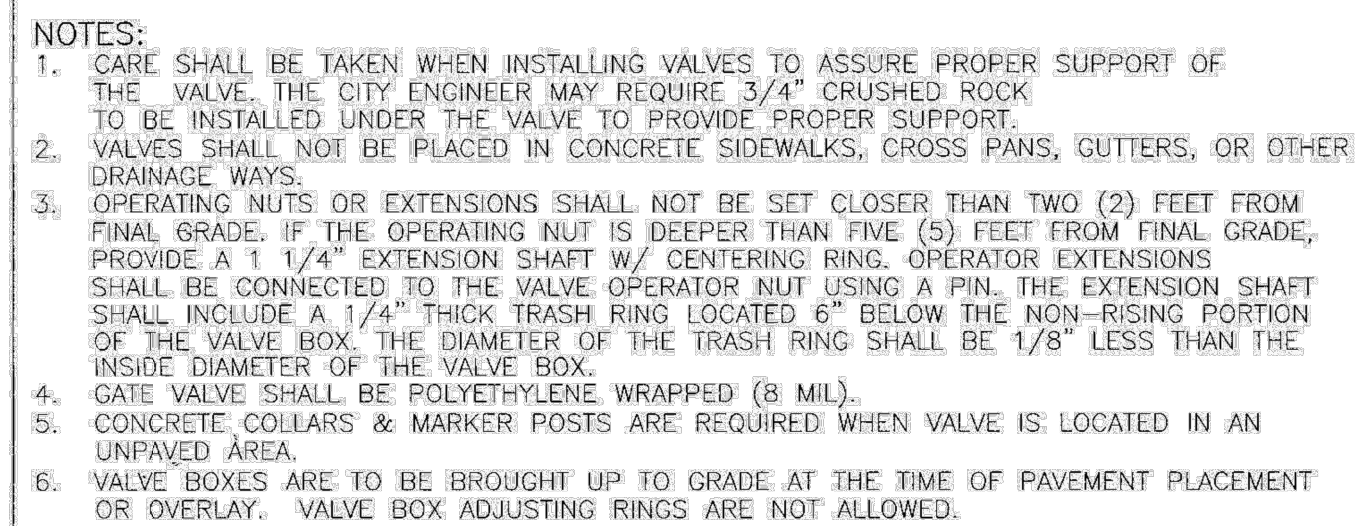
RECYCLED ASPHALT

ASPHALT PAVEMENT

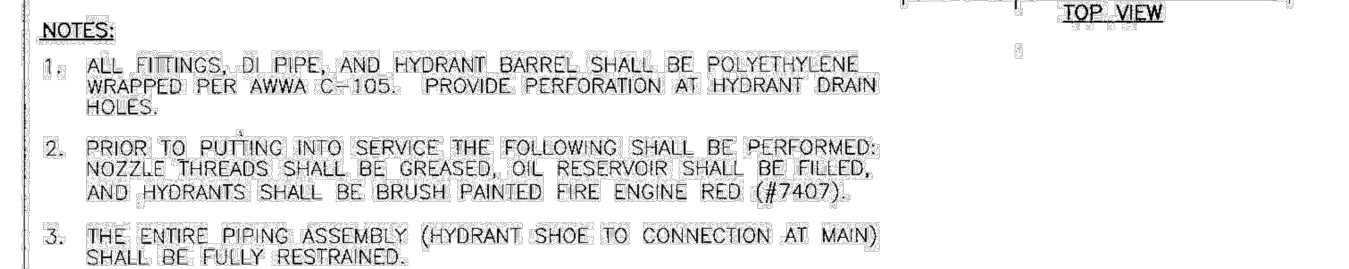
CONCRETE PAVEMENT

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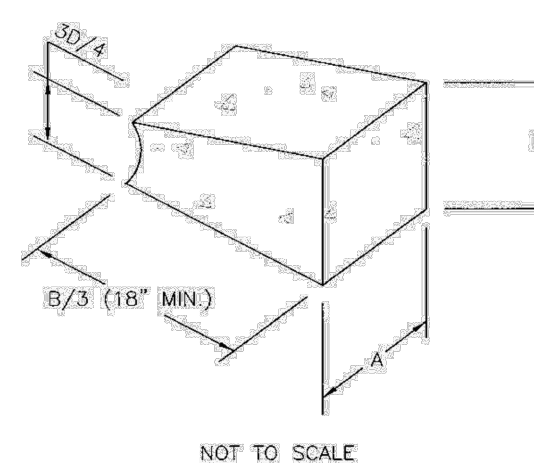
	DESIGN STANDARDS	STANDARD DRAWING
	VALVE BOX	W1 DATE: 8/15/14



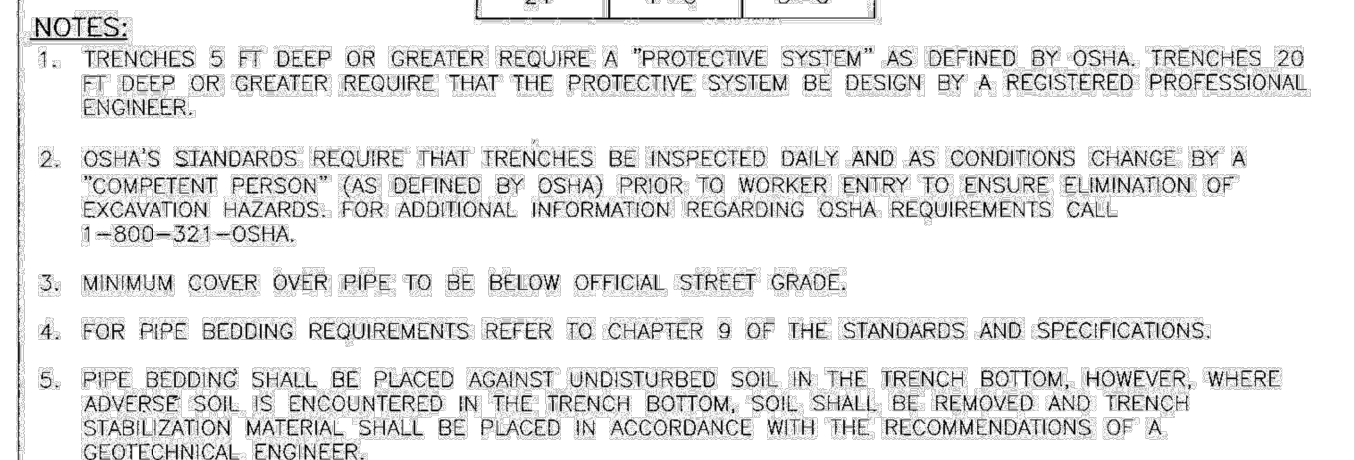
	DESIGN STANDARDS	STANDARD DRAWING
	FIRE HYDRANT INSTALLATION DETAIL	W2
COME PAINT YOUR FUTURE WITH US		DATE: 8/15/14

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"

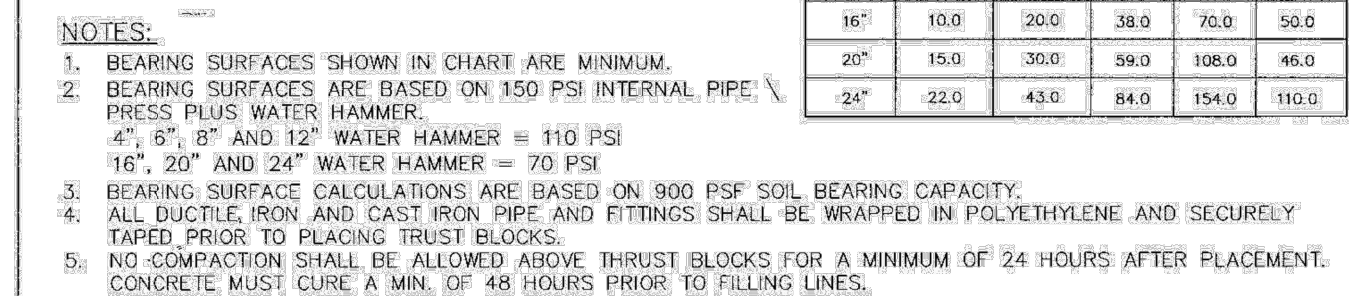
1. BEARING SURFACE AREAS SHOWN IN CHART ARE MINIMUM.
2. BASED ON 150 P.S.I. INTERNAL PIPE PRESSURE.
3. SOIL BEARING CAPACITY = 2000 LB./SQ. FT.
4. ALL FITTINGS TO BE WRAPPED WITH POLYETHYLENE (MINIMUM 8 MIL.).



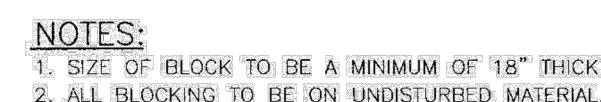
 COME PAINT YOUR FUTURE WITH US.	DESIGN STANDARDS	STANDARD DRAWING
	TYPICAL TRENCH BLOCK DIMENSIONS	W4
		DATE: 8/15/14.



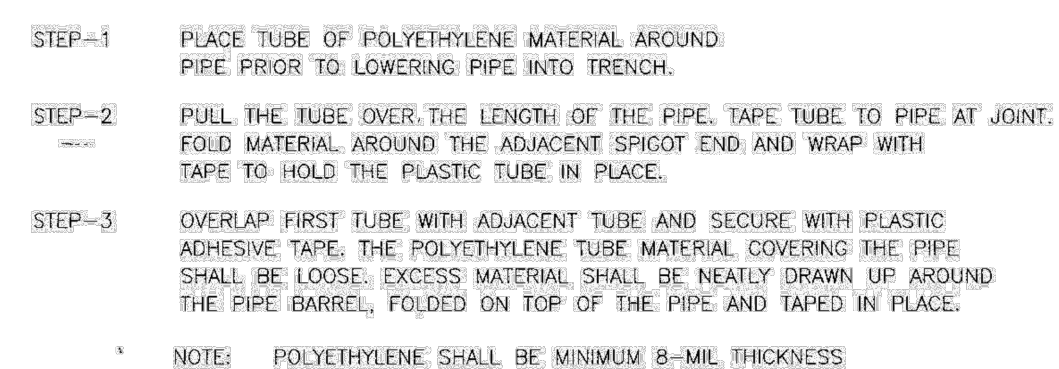
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	TYPICAL TRENCH SECTION PIPE PROTECTION	W1
		DATE: 8/15/14



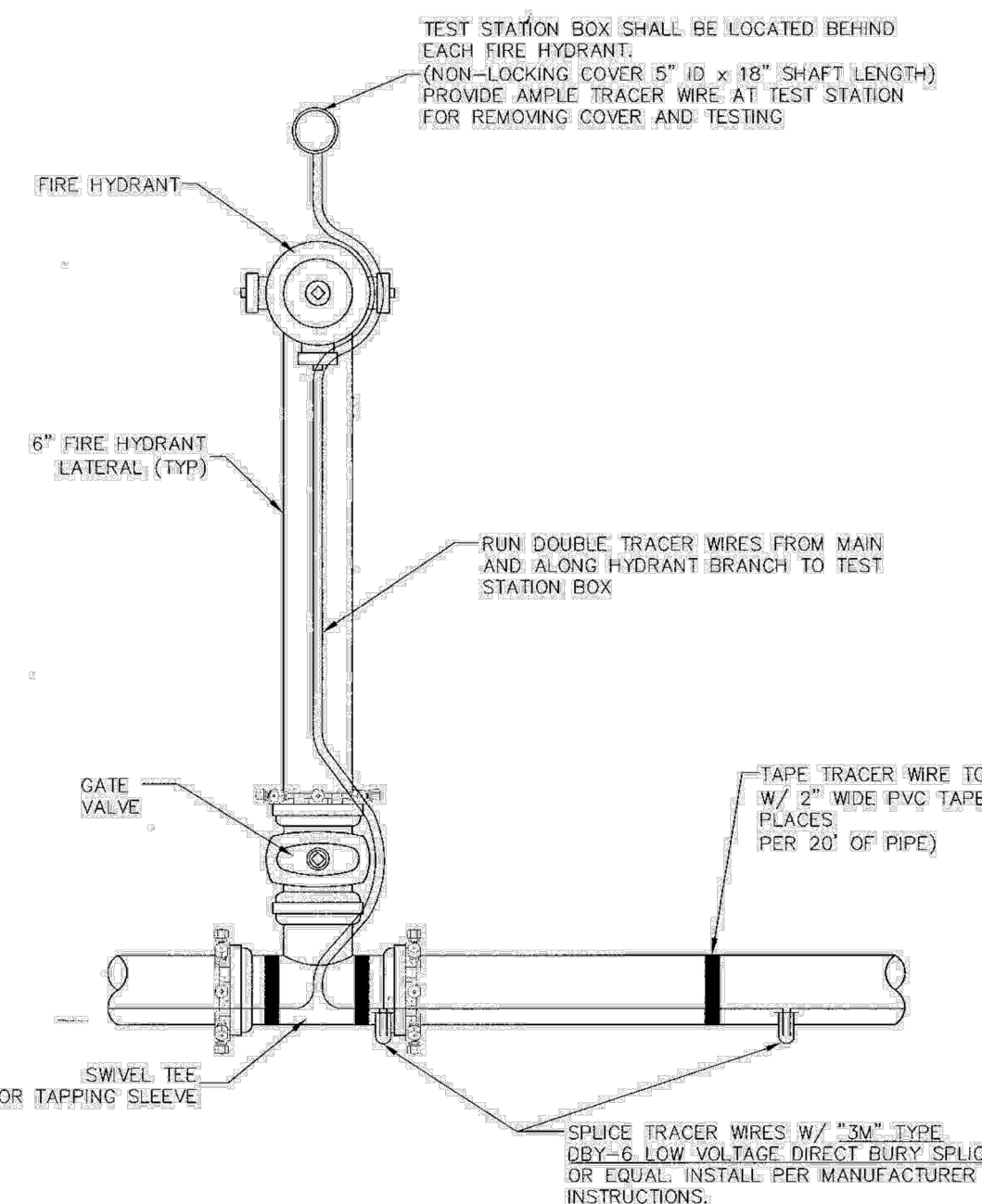
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	CONCRETE THRUST BLOCKS - BEARING SURFACES AND INSTALLATION	W3 DATE: 8/15/14



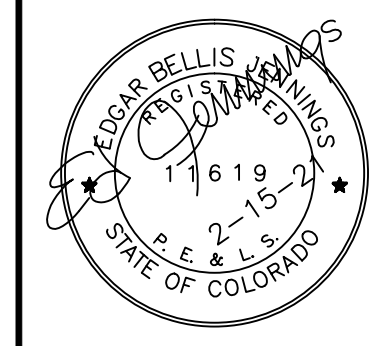
 COME WANT YOUR FUTURE WITH US	DESIGN STANDARDS	STANDARD DRAWING
	CONCRETE THRUST BLOCK FOR UNBALANCED SURFACES	W5 DATE: 6/15/14



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

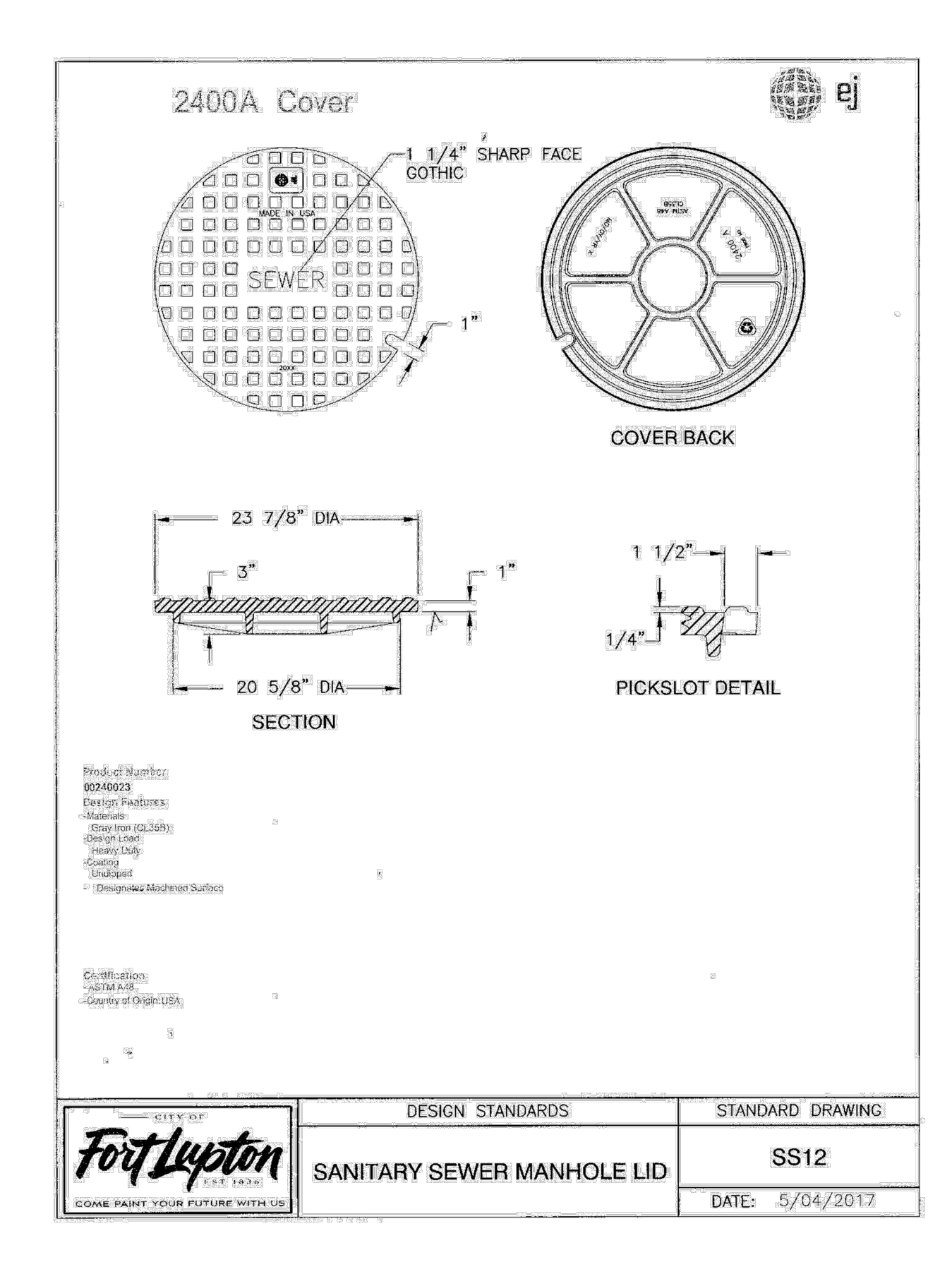
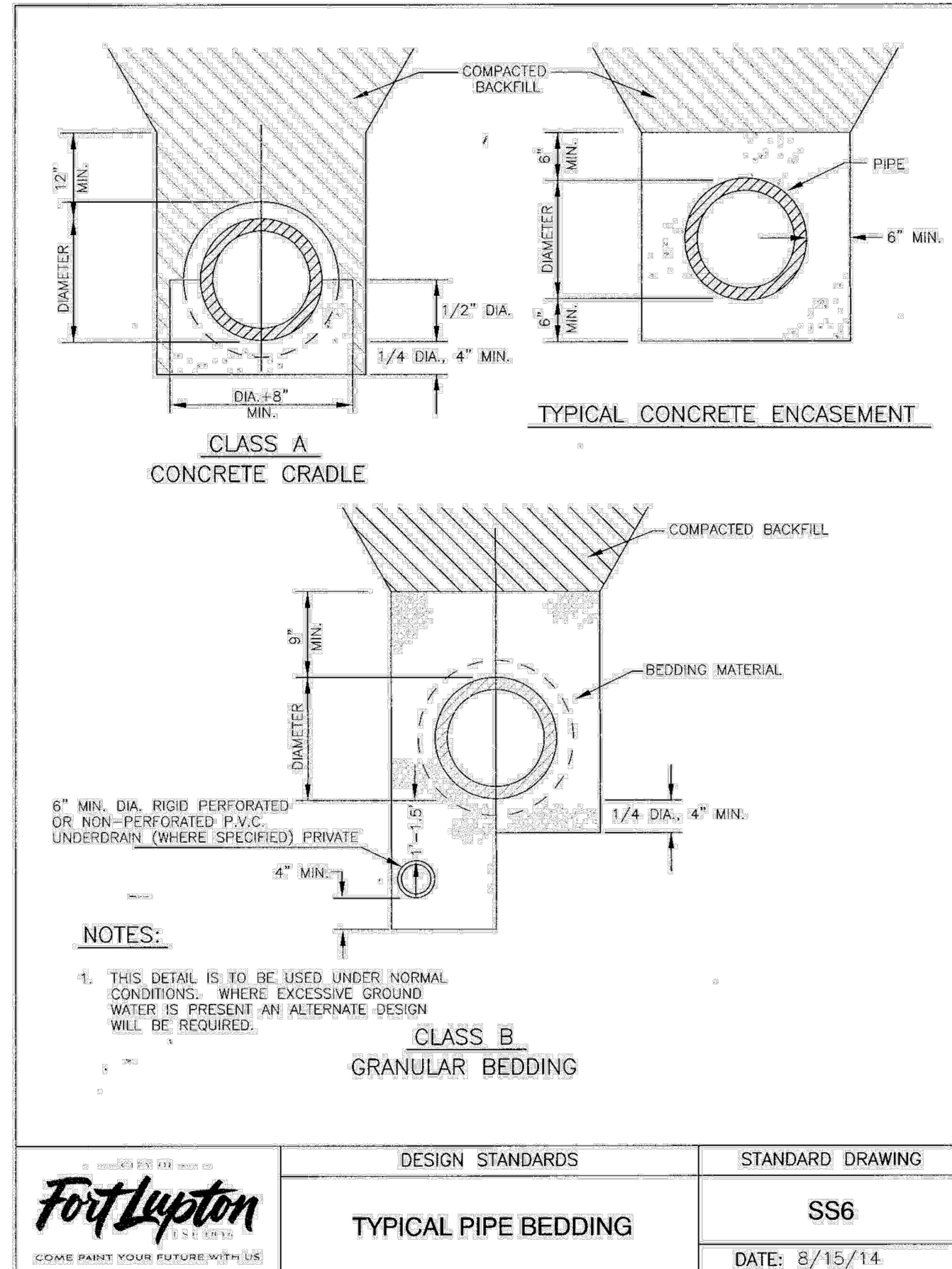
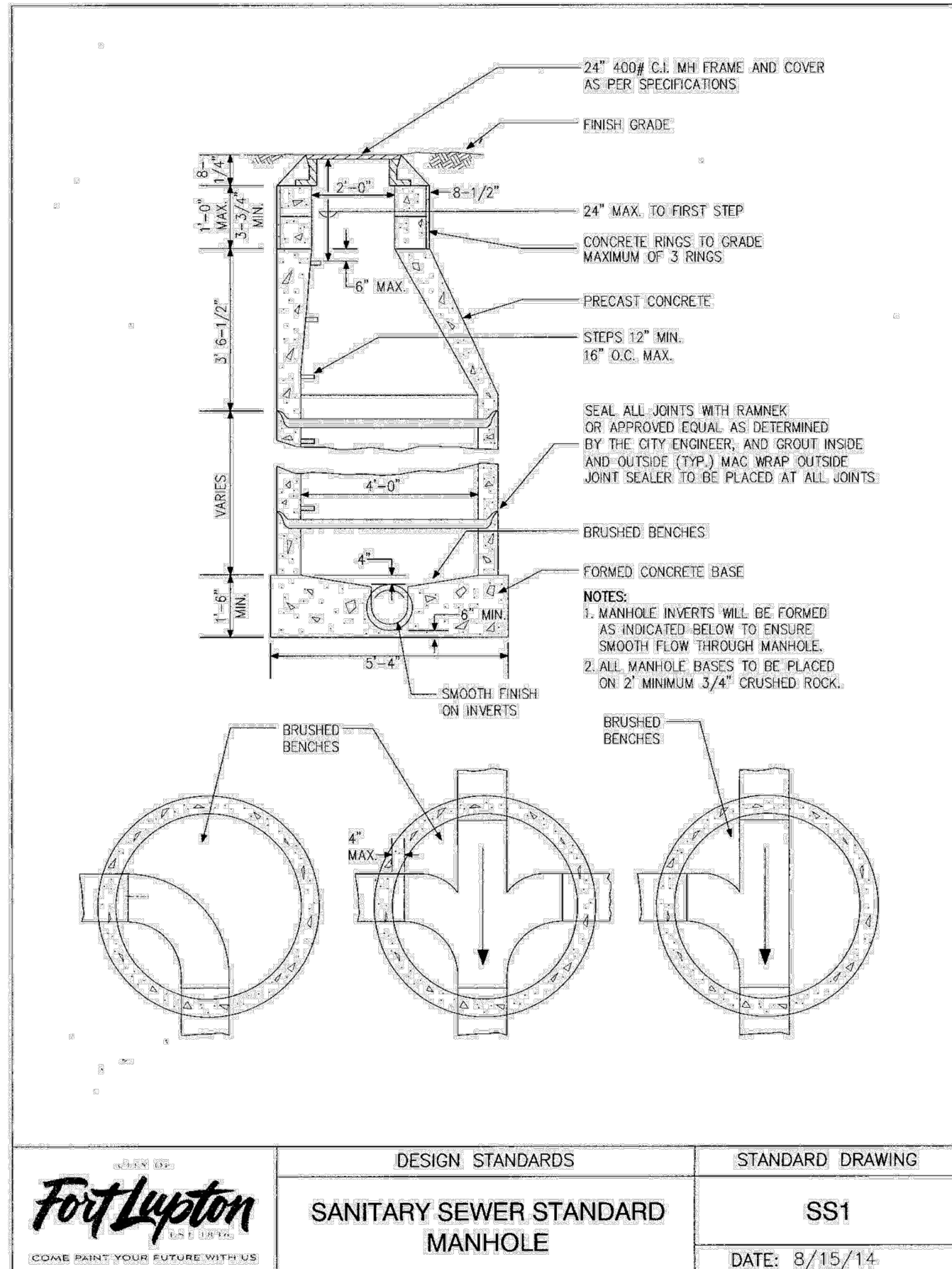
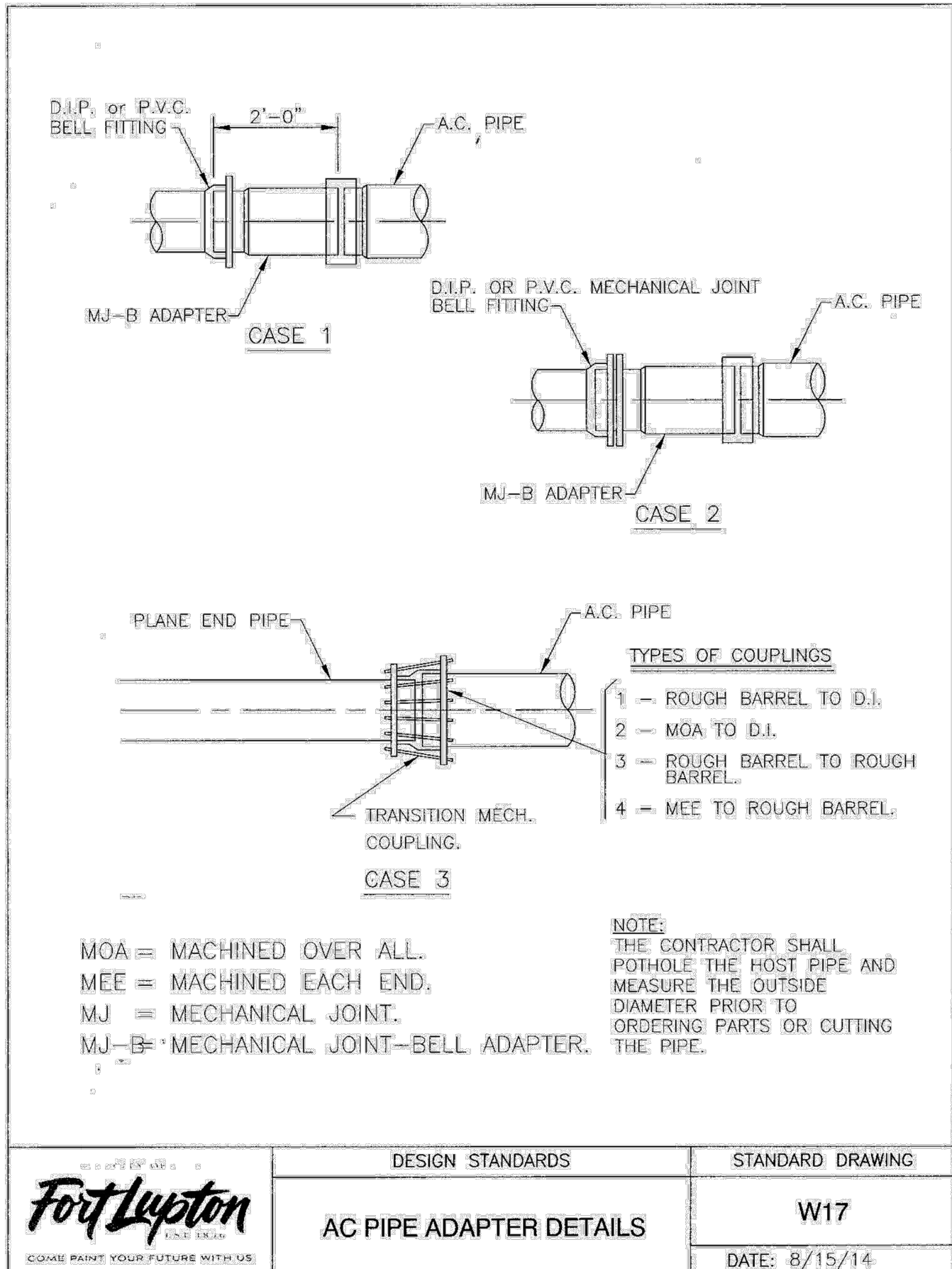
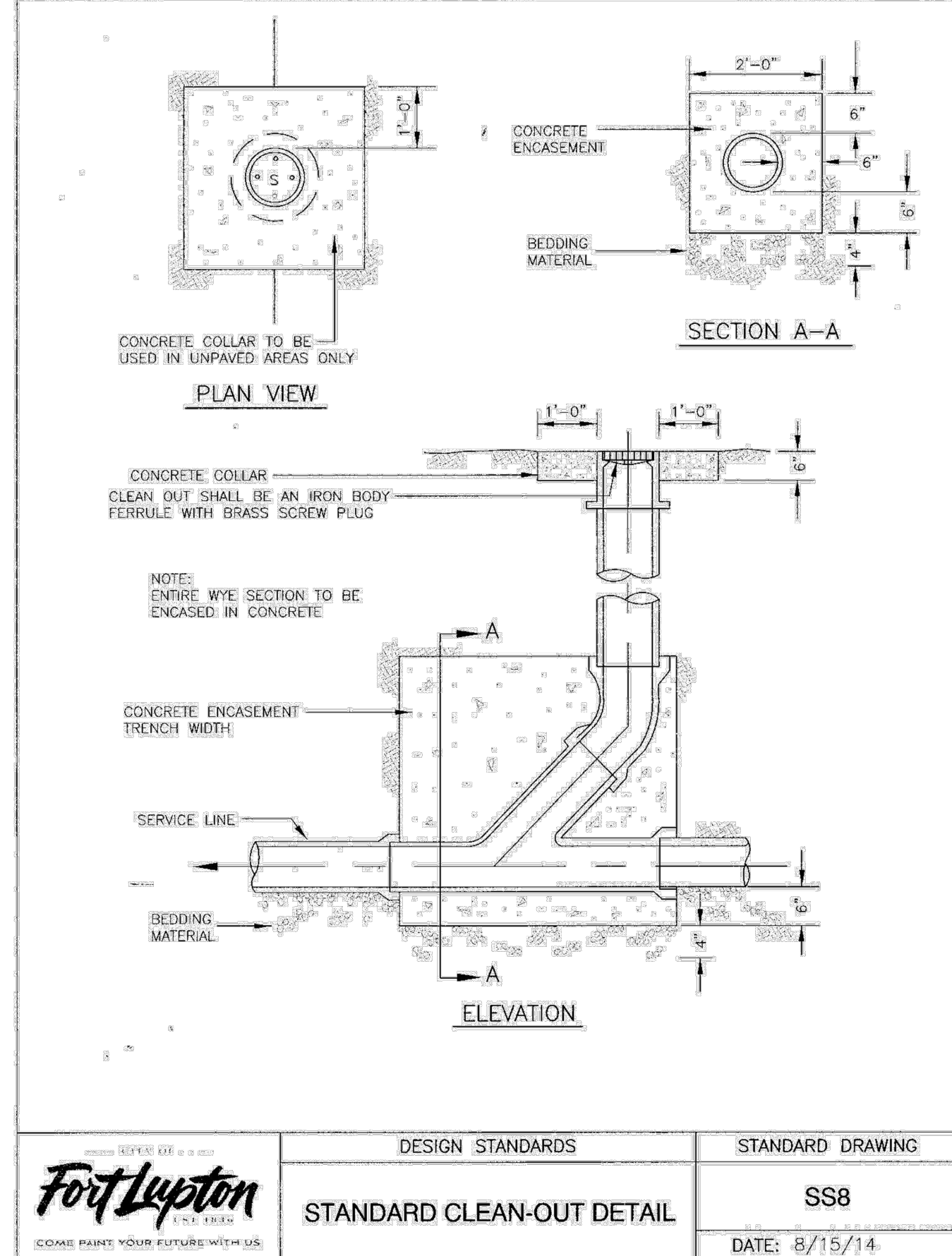
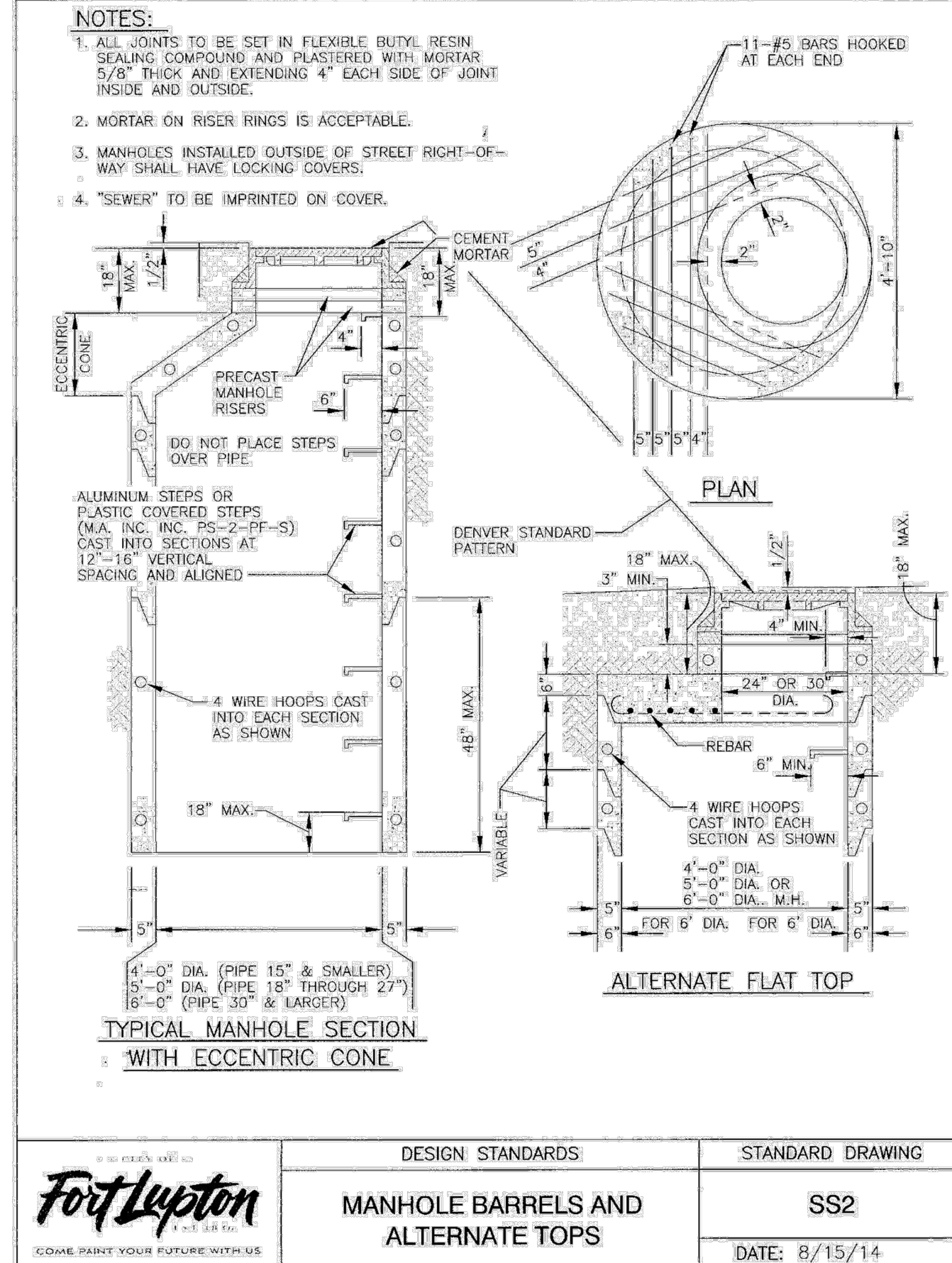
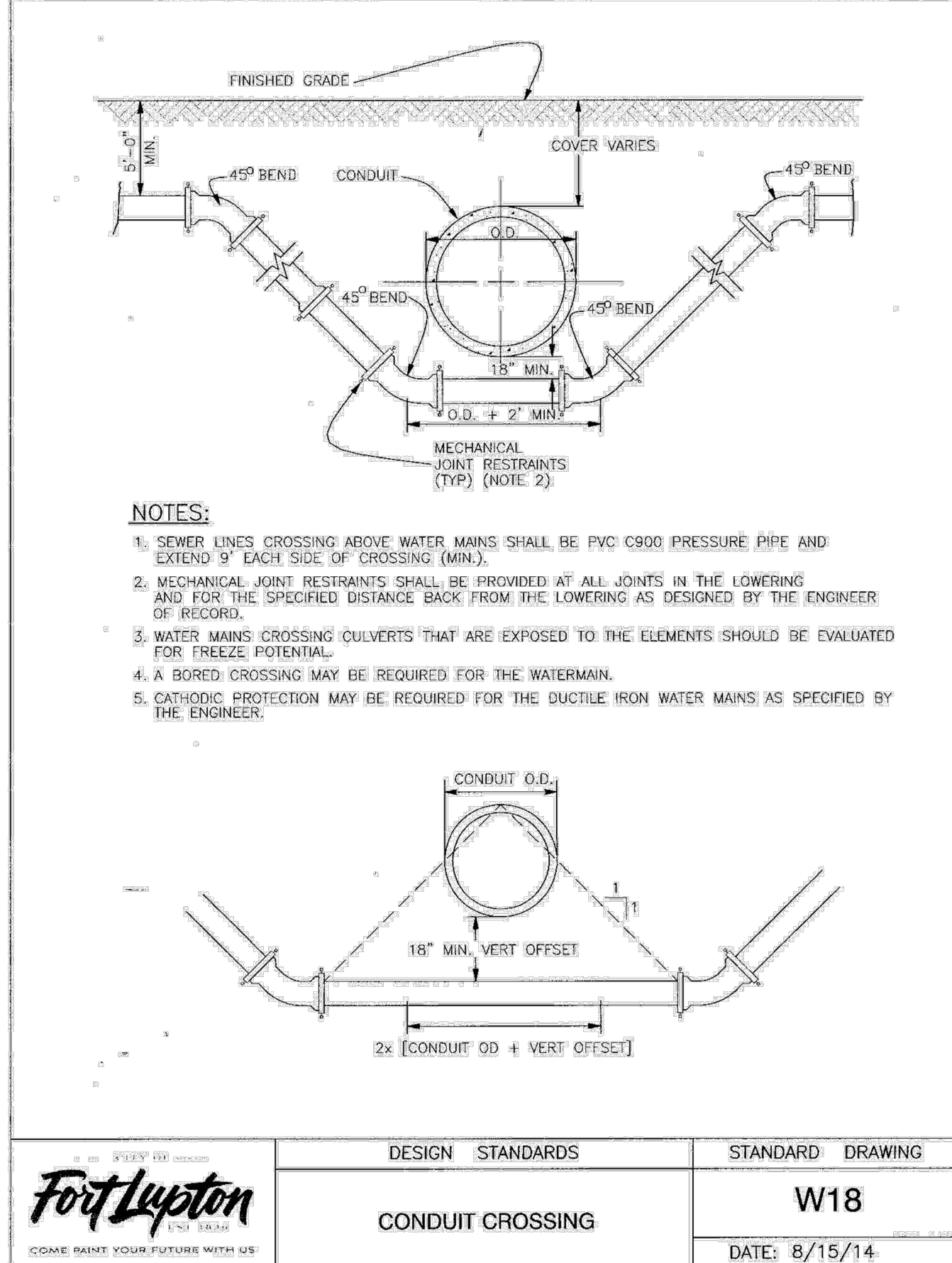
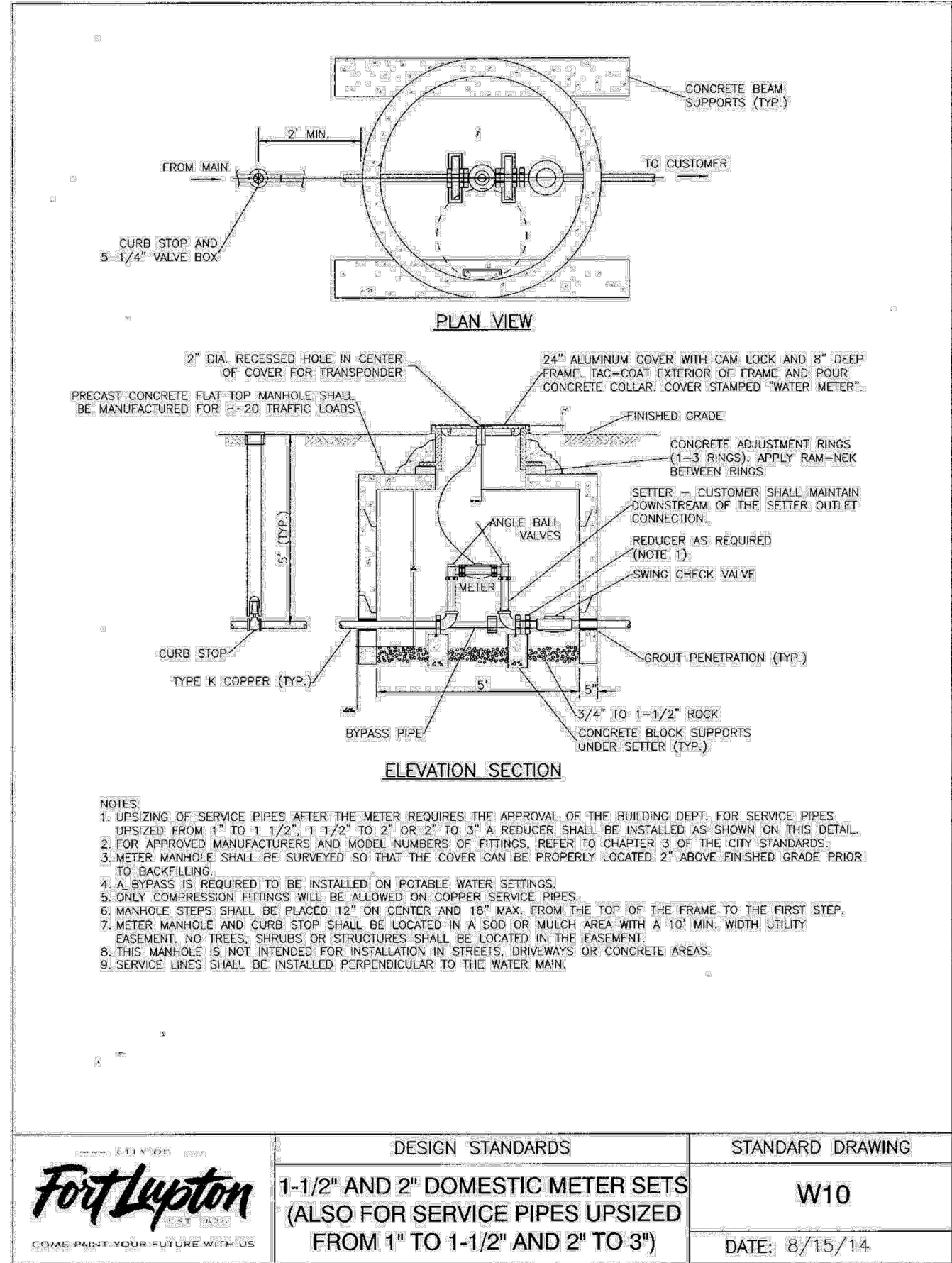


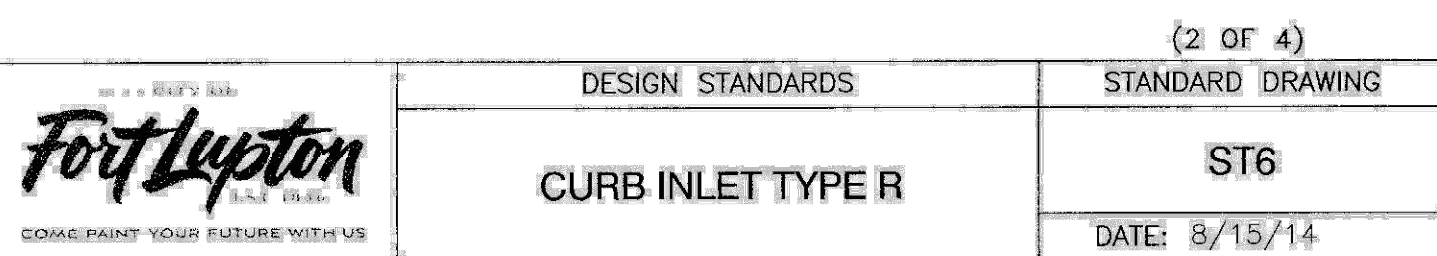
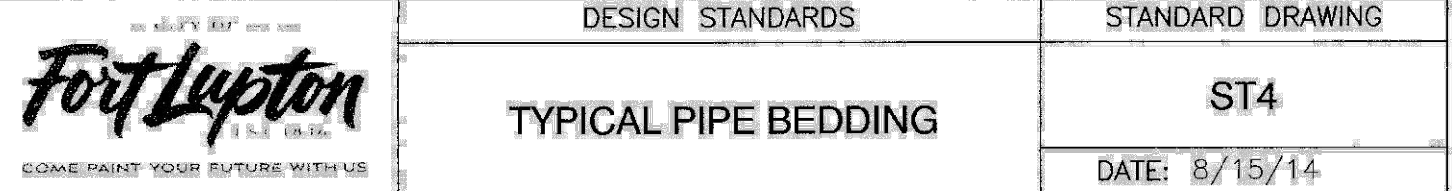
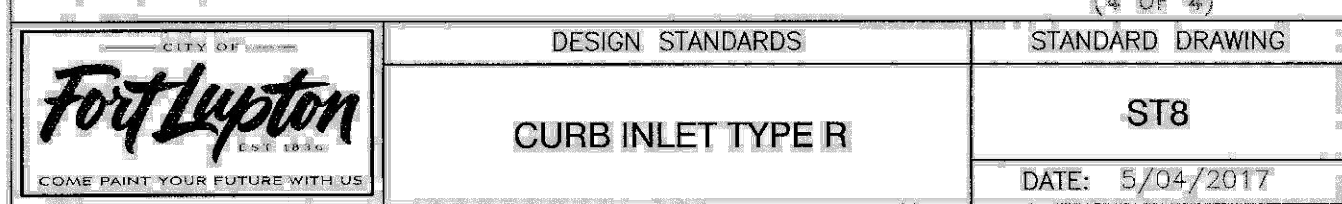
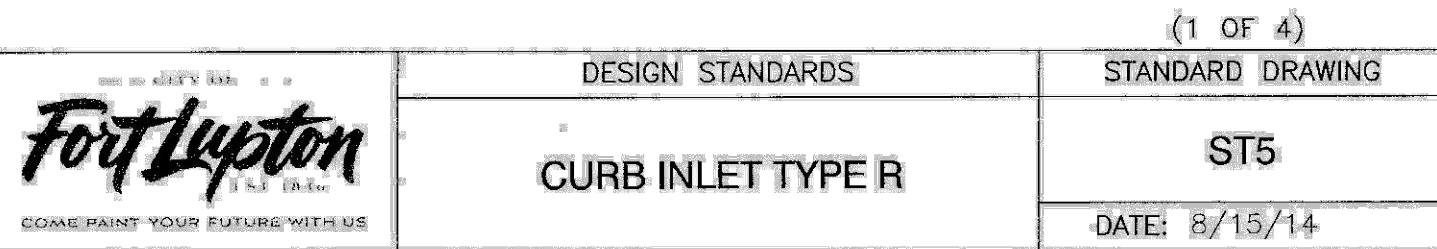
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	TRACER WIRE	W7
		DATE: 8/15/14

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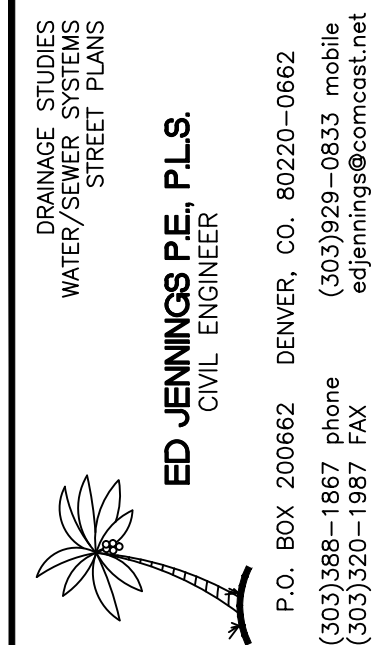
Sht:	17 of 21
Job No:	16107-03
Dwg No:	CP47B107.DWG
Hor:	
Ver:	
Date:	2-15-21
Des:	EJ
Dwg:	EJ

Title:	WATER DETAILS
Project:	TRANSWEST TRUCK & TRAILER, PHASE 3 FORT LUPTON, COLORADO
For:	GEP INVESTMENTS

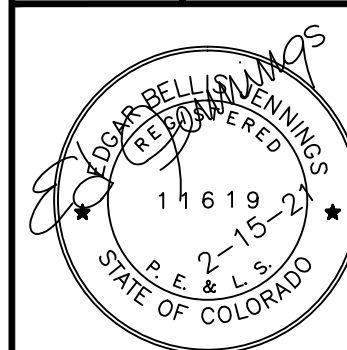




		(3 OF 4)	
• 40 EN EN •  Fort Lupton EST. 1886 COARSE PAPER YOUR FUTURE WITH US	DESIGN STANDARDS	STANDARD DRAWING	
	CURB INLET TYPE R	ST7	
		DATE: 8/15/14	



BEFORE YOU DIG
FOR BURIED CABLE LOCATIONS
CALL U.N.C.C. 48 HOURS BEFORE DIGGING
1-800-922-1087

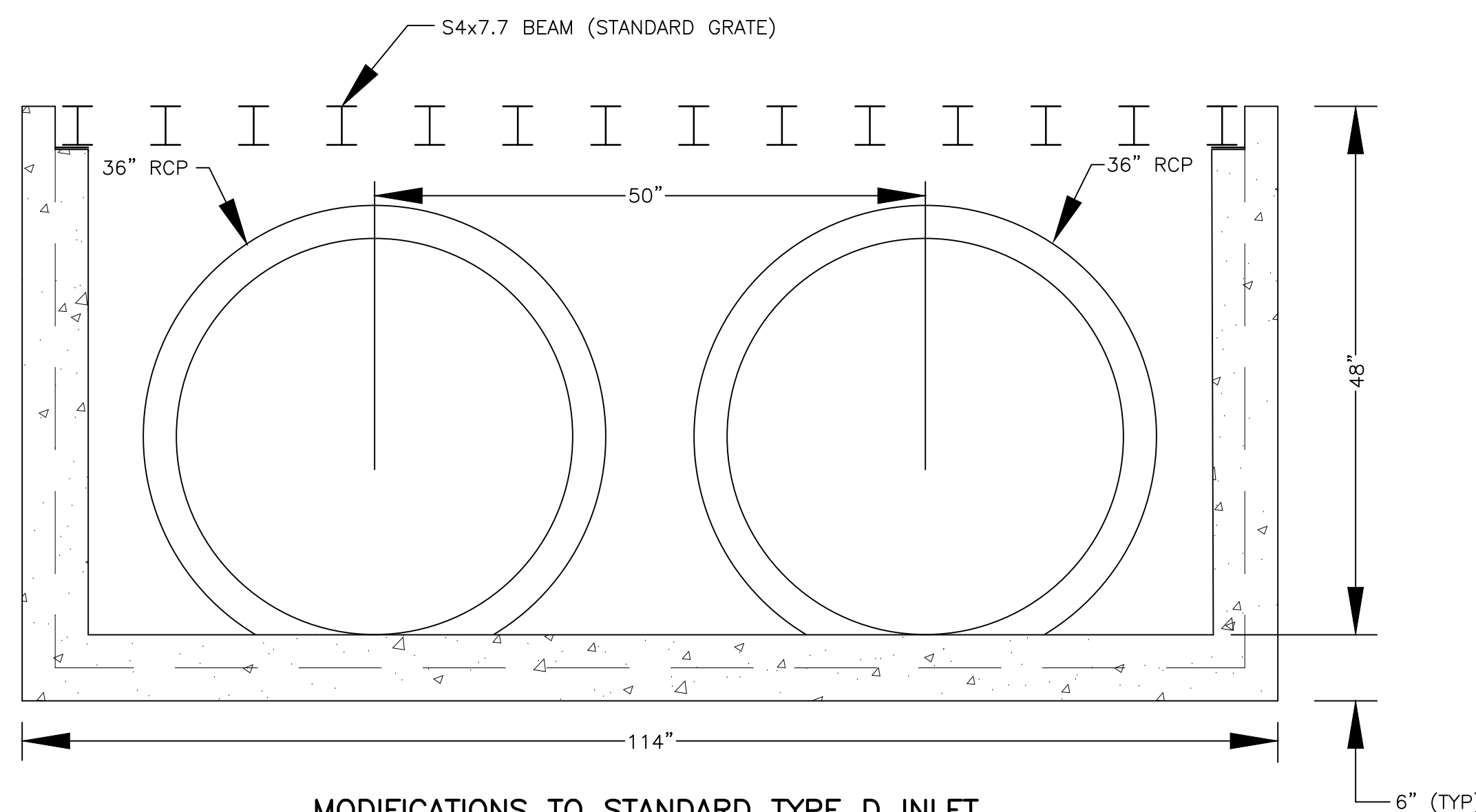
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Sht:	20 of 21
Job No:	16107-03
Dwg No:	CP50B107.DWG
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Ver:	
Date:	2-15-21
Des:	EJ
Dwg:	EJ
Chk:	EJ

STORM SEWER DETAILS

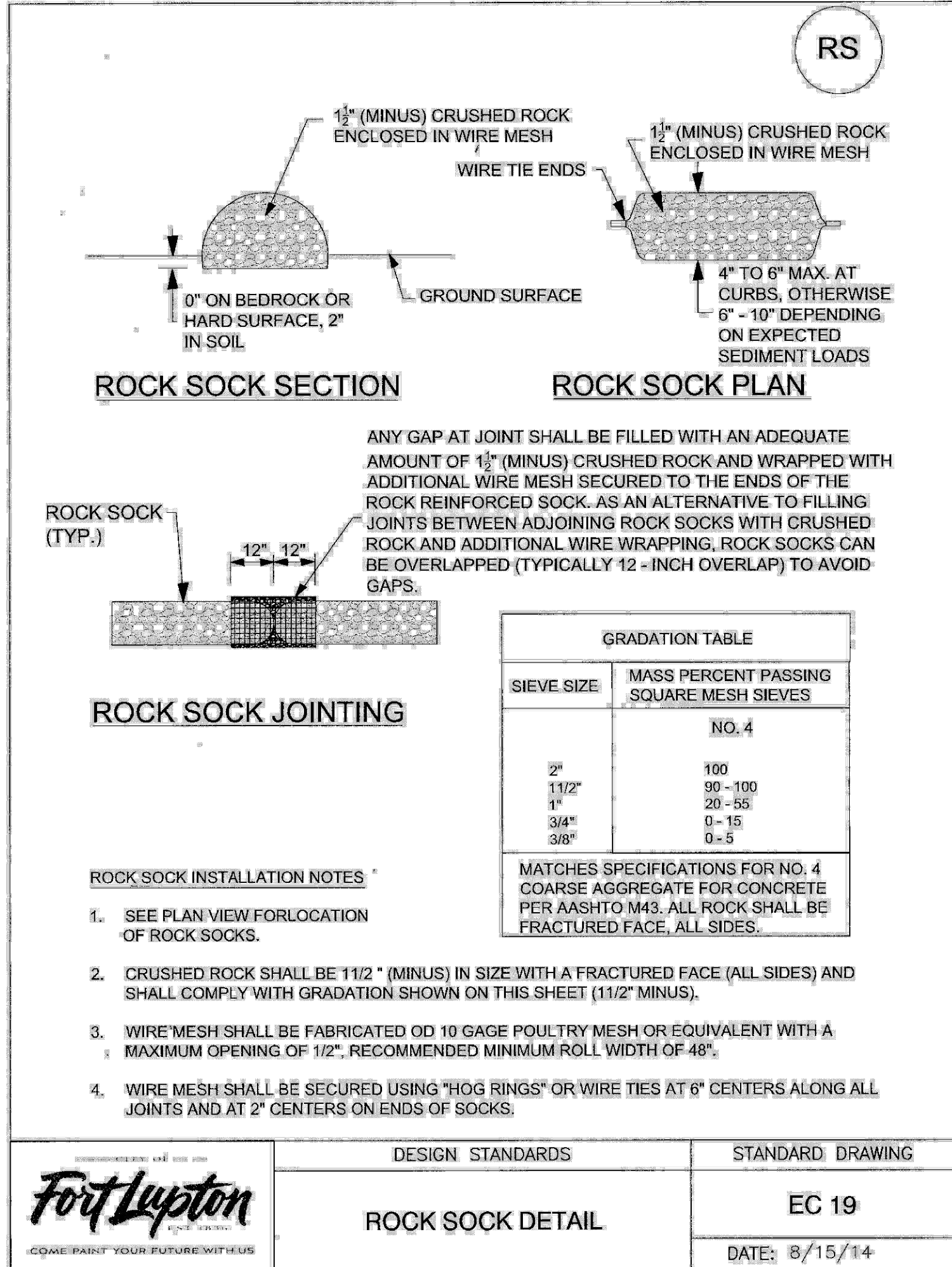
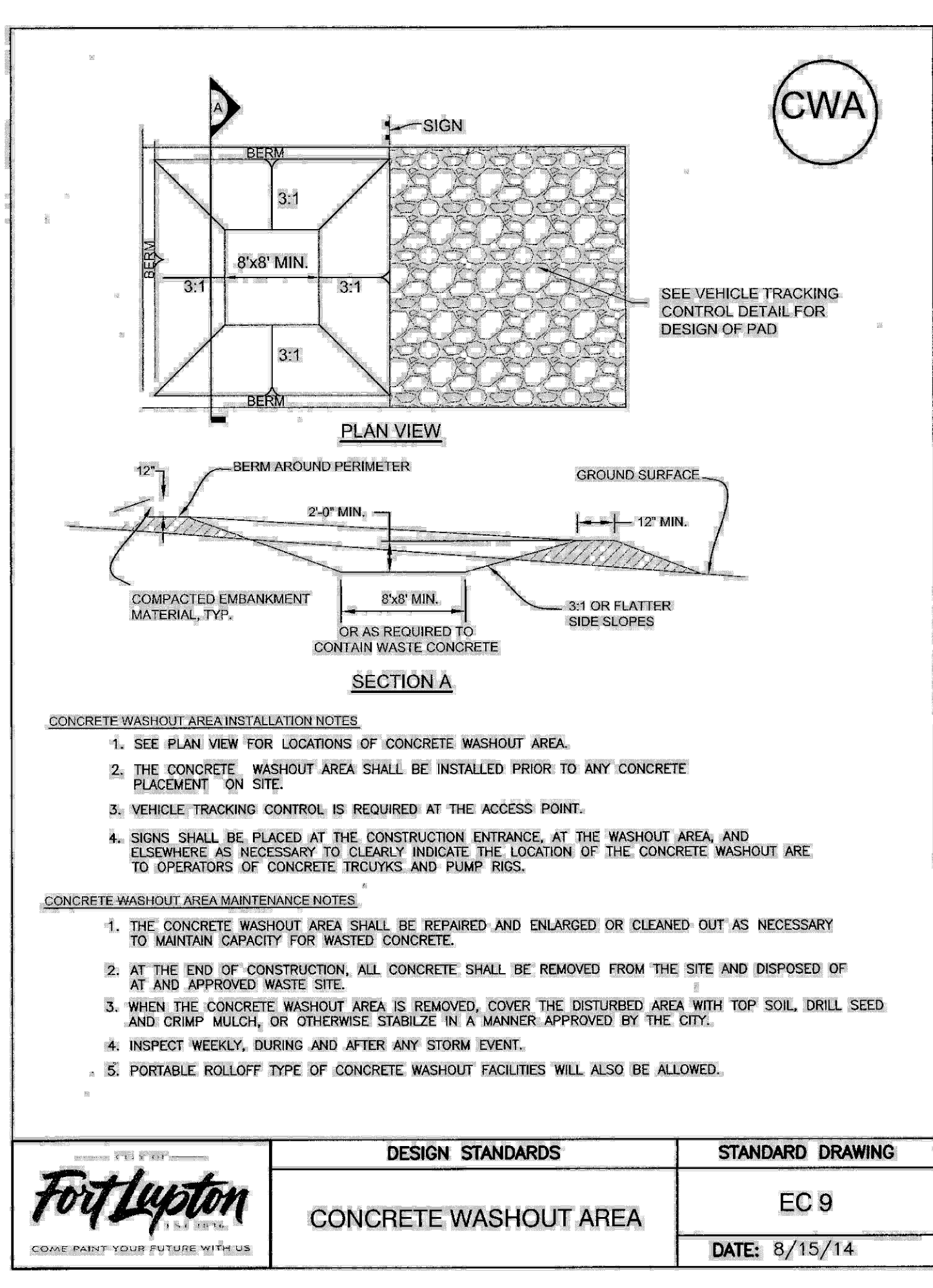
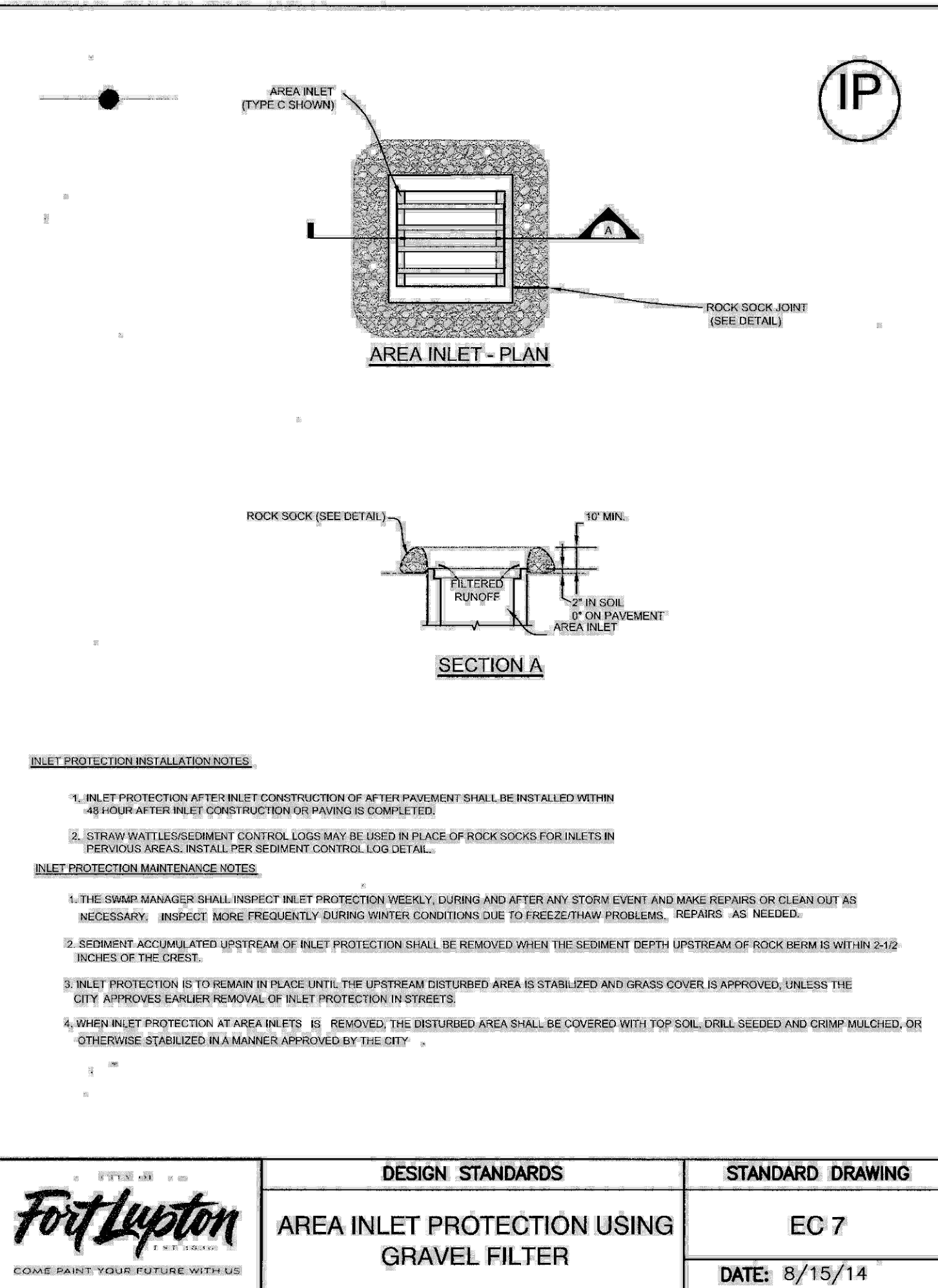
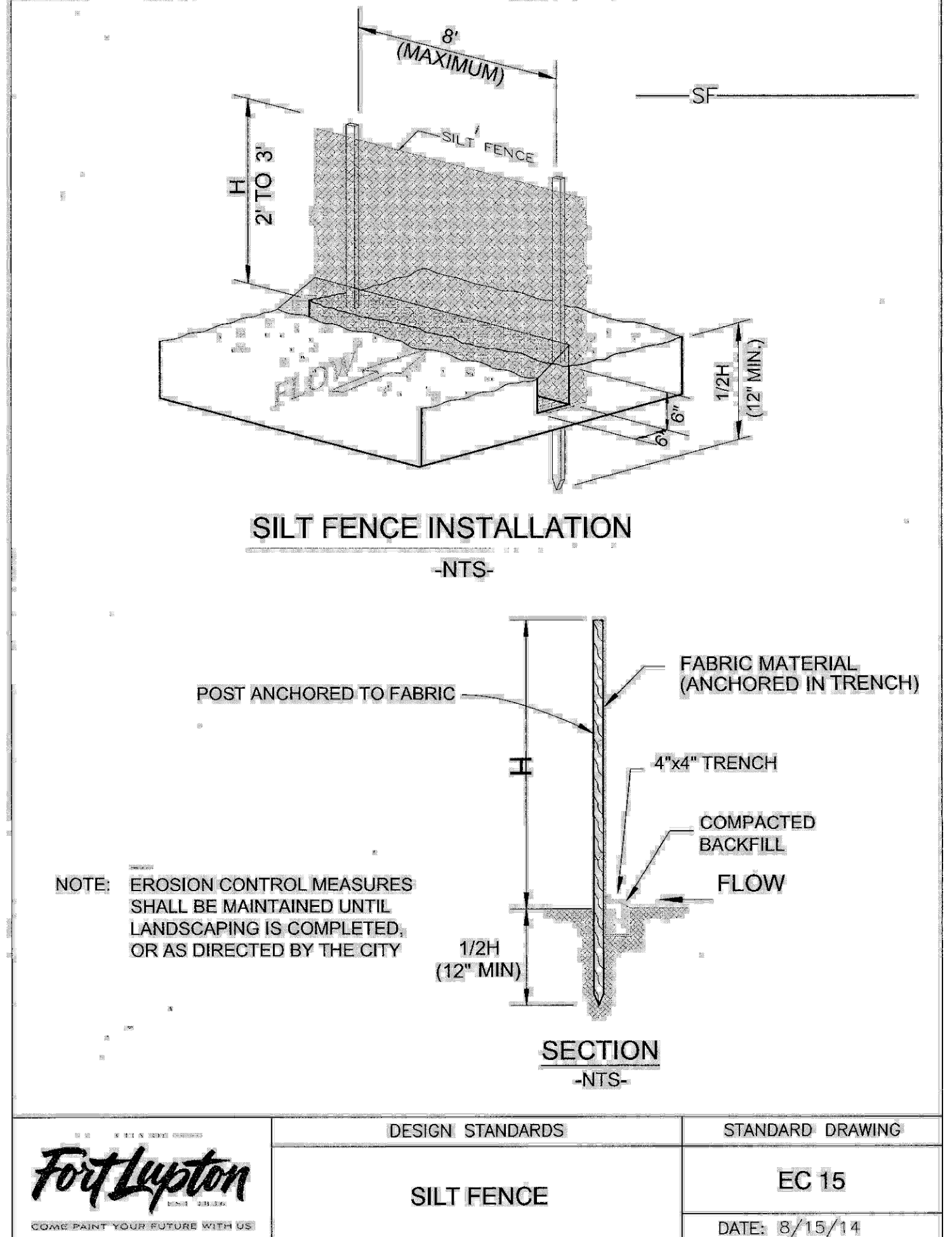
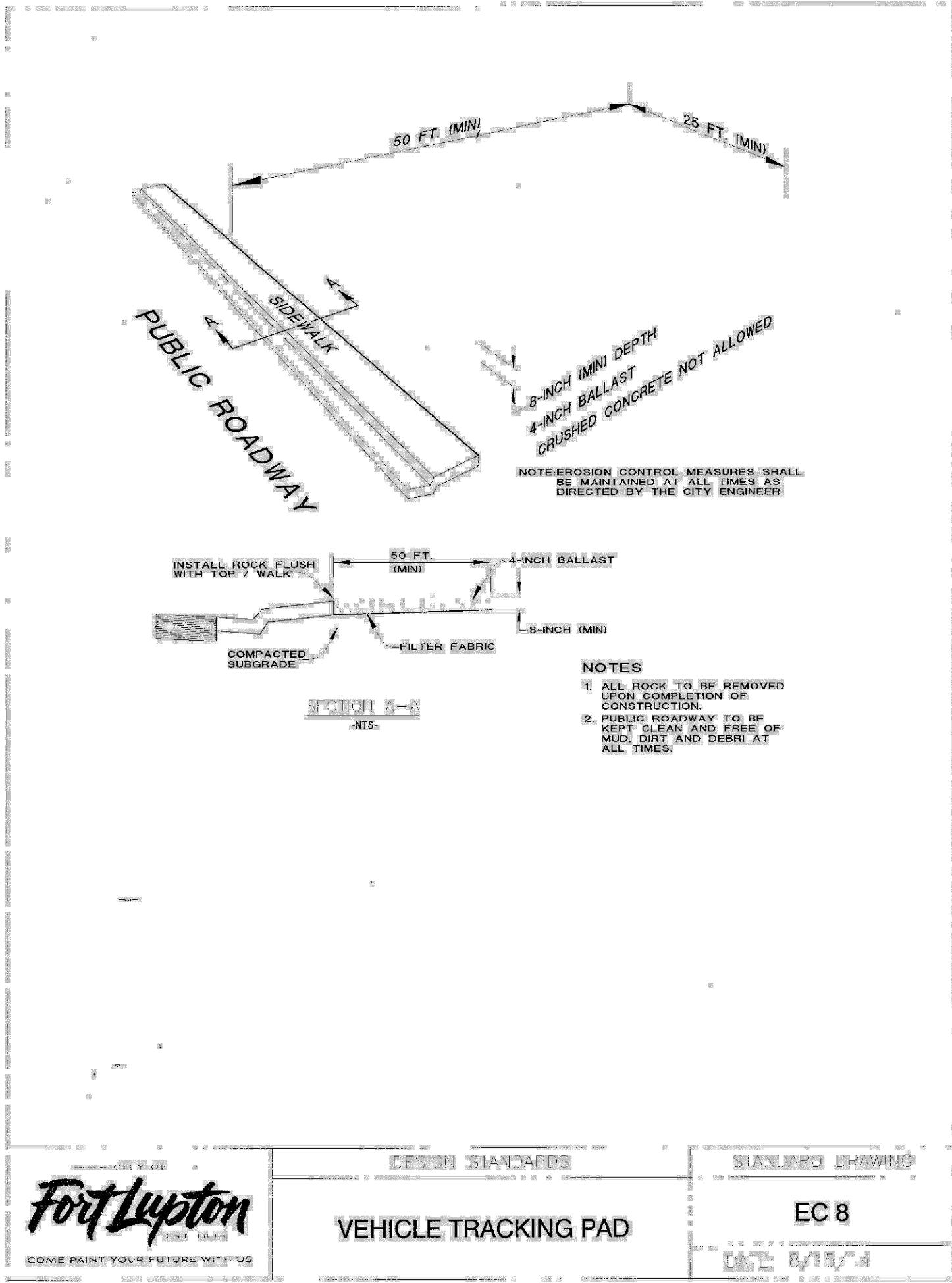
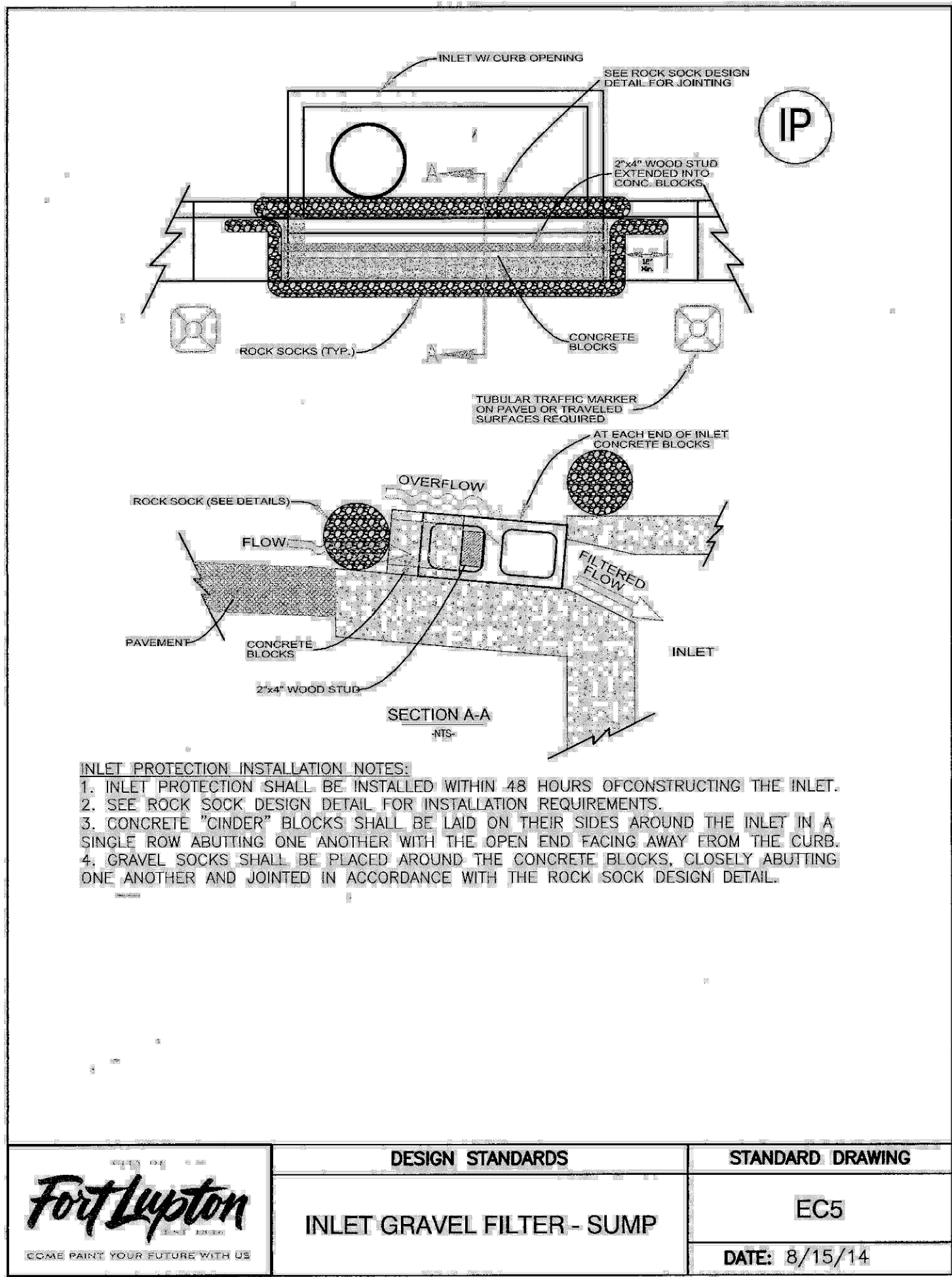
TRANSWEST TRUCK & TRAILER, PHASE 3
FORT LUPTON, COLORADO

or: GEP INVESTMENTS



MODIFICATIONS TO STANDARD TYPE D INLET
1"= 1'±

NOTE: MODIFICATION OF THE TYPE D INLET CONSISTS OF INCREASING IT'S LENGTH FROM 80" TO 98".



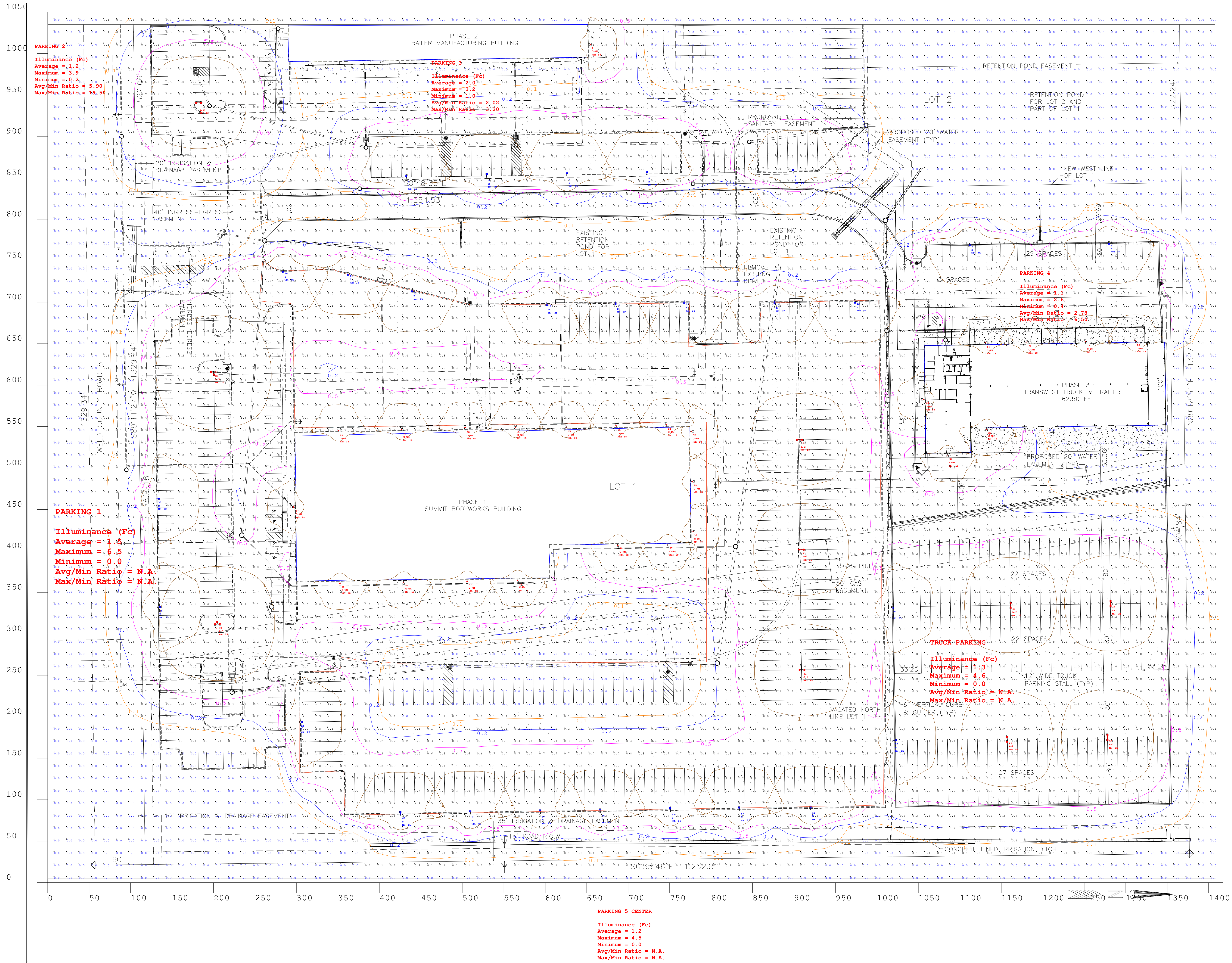
Luminaire Schedule							
Qty	Symbol	Label	Arrangement	LLF	Description	Lum. Watts	Total Watts
8		A-2	BACK-BACK	0.864	USSL-PA2B-740-U-5WQ	151	2416
2		A-3	3 @ 90 DEGREES	0.864	USSL-PA2B-740-U-5WQ	151	906
27		B	SINGLE	0.864	USSL-PA2B-740-U-TW	151	4077
25		C-WM	SINGLE	0.864	USSL-PA1A-740-U-TW	54	1359

Qty	Symbol	Label	Arrangement	LLF	Description	Lum. Watts	Total Watts
8		A-2	BACK-BACK	0.864	USSL-PA2B-740-U-5WQ	151	2416
2		A-3	3 @ 90 DEGREES	0.864	USSL-PA2B-740-U-5WQ	151	906
27		B	SINGLE	0.864	USSL-PA2B-740-U-TW	151	4077
25		C-WM	SINGLE	0.864	USSL-PA1A-740-U-TW	54	1359

Calculation Summary							
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
CalcPto @ Grade	Illuminance	Fc	0.7	6.5	0.0	N.A.	N.A.
PARKING 1	Illuminance	Fc	1.5	6.5	0.0	N.A.	N.A.
PARKING 2	Illuminance	Fc	1.2	3.9	0.2	5.90	19.50
PARKING 3	Illuminance	Fc	2.0	3.2	1.0	2.02	3.20
PARKING 4	Illuminance	Fc	1.1	2.6	0.4	2.70	6.50
PARKING 5 CENTER	Illuminance	Fc	1.2	4.5	0.0	N.A.	N.A.
TRUCK PARKING	Illuminance	Fc	1.3	4.6	0.0	N.A.	N.A.

Recommended Minimum Illuminance Values Parking Lot Basic Requirements, not for security lighting							
Location of Lot	Area	Intensity	Minimum Illuminance (Fc)	Minimum Illuminance (Fc)	Minimum Illuminance (Fc)	Minimum Illuminance (Fc)	Minimum Illuminance (Fc)
1. General Purpose Parking	100,000 sq. ft. or less	100 fc/cw	1.0	1.0	1.0	1.0	1.0
2. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
3. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
4. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
5. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
6. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
7. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
8. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
9. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
10. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
11. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
12. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
13. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
14. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
15. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
16. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
17. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
18. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
19. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
20. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
21. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
22. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
23. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
24. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
25. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
26. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
27. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
28. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
29. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
30. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
31. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
32. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
33. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
34. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
35. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
36. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
37. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
38. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
39. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
40. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
41. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
42. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
43. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
44. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
45. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
46. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
47. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
48. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
49. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
50. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
51. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
52. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
53. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
54. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
55. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
56. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
57. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
58. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
59. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
60. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
61. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0
62. General Purpose Parking	100,001 sq. ft. or more	100 fc/cw	1.0	1.0	1.0	1.0	1.0

Luminaire Location Summary							
LumNo	Label	X	Y	Z	Orient	Tilt	
1	C-WM	654.162	1011.193	18	0	0	
2	A-2	101.812	940.701	25	0	0	
3	B	898.944	856.055	25	90	0	
4	B	722.421	853.843	25	90	0	
5	B	626.291	852.644	25	90	0	
6	B	329.435	851.385	25	90	0	
7	B	832.559	849.418	25	90	0	
8	B	1279.964	773.592	25	270	0	
9	B	1112.092	771.672	25	270	0	
10	B	283.757	739.187	25	270	0	
11	B	362.43	736.187	25	269.497	0	
12	B	439.383	716.027	25	271.636	0	
13	B	973.581	702.488	25	270	0	
14	B	767.734	702.093	25	270	0	
15	B	876.498	701.701	25	270	0	
16	B	684.734	700.716	25	270	0	
17	B	601.733	699.733	25	270	0	
18	C-WM	1311.558	652.902	18	91.233	0	
19	C-WM	1251.539	652.298	18	91.233	0	
20	C-WM	1180.846	651.392	18	91.233	0	
21	C-WM	1130.798	650.612	18	91.233	0	
22	A-3	200.138	615.67	25	272.202	0	
23	C-WM	1057.056	582.913	18	180.36	0	
24	C-WM	746.148	551.883	18	90	0	
25	C-WM	685.373	550.399	18	90	0	
26	C-WM	625.385	548.736	18	90	0	
27	C-WM	564.413	548.539	18	90	0	
28	C-WM	503.244	547.048	18	90	0	
29	C-WM	1132.361	547.141	18	269.596	0	
30	C-WM	826.931	545.981	18	90	0	
31	C-WM	350.422	544.408	18	90	0	
32	C-WM	776.044	544.212	18	0	0	
33	A-2	906.544	534.227	25	0	0	
34	C-WM	1085.329	515.303	18	270.287	0	
35	C-WM	777.076	483.535	18	0	0	
36	B	131.326	463.18	25	0	0	
37	C-WM	297.106	452.994	18	180	0	
38	C-WM	777.568	423.301	18	0	0	
39	C-WM	747.832	407.979	18	270	0	
40	C-WM	687.725	407.665	18	270	0	
41	A-2	908.696	401.774	25	0	0	
42	C-WM	566.6	364.873	18	270	0	
43	C-WM	505.776	364.067	18	270	0	
44	C-WM	429.344	363.06	18	270	0	
45	C-WM	352.441	361.47	18	270	0	
46	A-2	1281.722	336.836	25	90	0	
47	A-2	1161.253	334.685	25	90	0	
48	B	132.887	332.416	25	0	0	
49	B	1016.891	331.383	25	0	0	
50	A-3	204.41	311.739	25	90	0	
51	A-2	909.617	256.413	25	0	0	
52	B	303.385	193.748	25	0	0	
53	A-2	1278.034	175.188	25	90	0	
54	A-2	1156.951	173.037	25	90	0	
55	B	1019.965	171.578	25	0	0	
56	B	920.691	81.708	25	90	0	
57	B	834.042	87.569	25	90	0	
58	B	750.734	86.798	25	90	0	
59	B	666.02	84.909	25	90	0	
60	B	593.767	84.029	25	90	0	
61	B	509.303	83.274	25	90	0	
62	B	425.47	82.141	25	90	0	





Applications Engineering
1121 Highway 74 South
Peachtree City, GA 30269

tel no: 770-486-45xx
fax no: 770-486-4599
e-mail: mkt-lightingapplications@cooperlighting.com



Applications Engineering
1121 Highway 74 South
Peachtree City, GA 30269

tel no: 770-486-45xx
fax no: 770-486-4599
e-mail: mkt-lightingapplications@cooperlighting.com

Project Name:
Transwest Truck Phase 3
Fort Lupton, CO

Client:
Primus Marketing Group, Inc

Drawn By:
Claudius Anderson

Date:
2/24/2021
Scale: 1" = 50'

Project No:
2100260.AGI

FINAL DRAINAGE REPORT

FOR

**TRANSWEST TRUCK AND TRAILER
(PHASE 3)**

AND

AMENDMENTS TO DRAINAGE REPORTS FOR PHASES 1 AND 2

LOCATED IN LOTS 1 & 2, TRANSWEST NORTH MINOR SUBDIVISION-FIRST AMENDMENT,
A PART OF THE SW 1/4, SE/4, SECTION 17, T1N, R66W
FORT LUPTON, COLORADO

Prepared by

Ed Jennings PE & PLS
PO Box 200662
Denver, Co. 80220
(303)388-1867

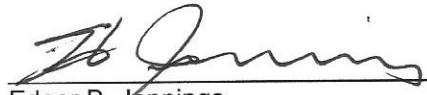

Edgar B. Jennings PE & PLS No. 11619



File No: DR9B6107
February 15, 2021

STANDARD STATEMENT 1

I hereby affirm that this report and plan for drainage design of the development, TRANSWEST TRUCK AND TRAILER (PHASE 3) and revisions to drainage designs for PHASES 1 and 2, located in Lots 1 and 2, TRANSWEST NORTH MINOR SUBDIVISION-FIRST AMENDMENT, was prepared by me in accordance with the provisions of the City of Fort Lupton Storm Drainage Design and Technical Criteria for the owner thereof. I understand that the City of Fort Lupton does not and will not assume liability for drainage facilities designed by others. I am also aware of the provisions of the City CODE as it pertains to the City's review.


Edgar B. Jennings
State of Colorado PE&PLS no. 11619

2-15-21
Date



STANDARD STATEMENT 2

GEP Investments, LLC, hereby affirms that the drainage facilities for the development, TRANSWEST TRUCK AND TRAILER (PHASE 3) and revisions to drainage designs for PHASES 1 and 2, located in Lots 1 and 2, TRANSWEST NORTH MINOR SUBDIVISION-FIRST AMENDMENT, shall be constructed according to the design presented in this report. I understand that the City of Fort Lupton does not and will not assume liability for drainage facilities designed and/or certified by my engineer. I understand that the City of Fort Lupton reviews drainage plans but cannot, on behalf of GEP Investments, LLC and/or their successors and/or assigns assume future liability for improper design. I am also aware of the provisions of the City CODE as it pertains to the City's review.


By: George Eidsness
Title: *President*

2-16-21
Date

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I. GENERAL LOCATION AND DESCRIPTION

1

A. Location

The subject site is located in the northeast part of the SW1/4, SE1/4, Section 17, Township 1 North, Range 66 West, City of Fort Lupton, County of Weld, State of Colorado.

This site is bounded on the west by TRANSWEST TRAILER MANUFACTURING FACILITY, the Phase 2 development, on the north by a farmer's field and residence, on the east by a private drive and farm properties on the other side of the private drive and on the south by SUMMIT BODY WORKS, the Phase 1 development. This site is located, at present, in the northeast part of Lot 2, TRANSWEST NORTH MINOR SUBDIVISION. It is proposed to replat this property so that it will be located within Lot 1.

B. Site Description

The subject property's features are described as follows:

Property Area: The subject property is presently located in that part of Lot 2, TRANSWEST NORTH MINOR SUBDIVISION lying north of Lot 1 and contains 287,628 sq ft or 6.603 acres.

Vegetation: The subject property has been used for farming in the past and there is no significant vegetation.

Topography: The site drains westerly with a typical slope that varies from 2 to 3 percent.

Soil Type: According to the Geotechnical Subsurface Exploration Report (see **VII REFERENCES** for citation), the soils on this property consist of an upper soil of silty to clayey sand and an underlying layer of sandy clay. Claystone bedrock was encountered at a depth of approximately 19 feet. Groundwater was not encountered in any of the test holes. See excerpts from this report in the appendix. Based on this, the soil on this site is considered to be classified within hydrologic group C.

Major drainageways: There are no major drainageways on or adjacent to this property.

Irrigation facilities: There are irrigation ditches along the north and east property lines of this site. Old irrigation ditches located within this site, used for irrigating only this property, are abandoned.

Existing site improvements and land use: This property is presently unimproved and is vacant. In the past, this property has been used as a farmer's field.

Adjacent street improvements: The private drive located east of this property is asphalt paved. No access is proposed from this private drive. A concrete lined, combination drainage and irrigation ditch runs along the west side of the private drive.

Adjacent storm sewers: There are no public storm sewers on or adjacent to this site. There are private storm sewers located within the Phase 1 and 2 developments.

II. DRAINAGE BASINS AND SUB-BASINS

2

A. Major Basin Description

Historically, the subject site and surrounding properties have drained westerly towards the South Platte River, located approximately 1.5 miles to the west.

B. Sub-Basin Description

The subject property drains westerly by sheet flow into the retention pond for Phase 2. This pond will be slightly deepened to additional flows from the phase 1 and 3 developments.

A. Regulations

The drainage plan and calculations have been made in accordance with Fort Lupton's "Storm Drainage and Technical Criteria (see **VII. REFERENCES** for citation).

B. Relevant Flood Hazard & Drainage Studies

Since this property is presently located within Lot 2, TRANSWEST NORTH MINOR SUBDIVISION, it was included within the FINAL DRAINAGE REPORT FOR TRAILER MANUFACTURING FACILITY, designated as Phase 2, prepared by me, dated March 11, 2019. The drainage report for the adjacent development to the South, designated as Phase 1, also prepared by me, was entitled FINAL DRAINAGE REPORT FOR SUMMIT BODY WORKS, last revised August 12, 2017. This Final Drainage Report was amended twice by addendums dated September 28, 2017 and February 16, 2018.

Since there is no printed F.I.R.M. for this area, this property does not lie with any Federally identified flood hazard area.

C. Hydrological Criteria

Storm runoff rates are calculated for the 5, 10, and 100 year storm return periods.

Due to the small size of the drainage basins, the "Rational Method" has been utilized for calculation of the runoff rates (see **VIII. APPENDICES, "Equations"**).

Composite runoff coefficients, where applicable, have been calculated using values from Urban Drainage and Flood Control District's "Storm Drainage Criteria Manual" (See **VII. REFERENCES** for citation and **VIII. APPENDICES, "Storm Runoff Calculations"**).

Since the top layer of the soils on this site are somewhat clayey, for runoff purposes, the soil type for this property is classified as hydrologic group "C" (see **I. GENERAL LOCATION AND DESCRIPTION, "Site Description"**). Runoff coefficients for "clayey" type soils are used in the "Rational Method" equation for calculation of storm runoff rates from undeveloped and landscaped areas.

Storm Intensities are taken from a table prepared from the "Time Intensity Frequency Tabulation" for Fort Lupton included in the appendices (see **VIII. APPENDICES, "Storm Runoff Calculations"**).

The "times of storm concentration", for determination of the "storm intensity", are calculated using the equation contained within Urban Drainage and Flood Control District's "Storm Drainage Criteria Manual" (see **VIII. APPENDICES, "Storm Runoff Calculations"**). The "times of storm concentration" at design points are separately calculated to permit addition of all contributing drainage basins.

Since there is no suitable drainage outlet for this project, it is proposed to drain the developed portions of this site into an expanded retention pond located to the west in the Phase 2 development to provide storm runoff storage and water quality enhancement. The minimum storage volume of the proposed retention pond is calculated in accordance with the equation contained within Chapter 5 of Weld County's Engineering and Construction Criteria Manual. (see **VII REFERENCES** for citation and **VIII. APPENDICES, "Equations"**).

D. Hydraulic Criteria

Hydraulic calculations are made in accordance with equations from Fort Lupton's Storm Drainage and Technical Criteria (see **VII. REFERENCES** for citation and **VIII. APPENDICES, "Equations"**).

IV. EXISTING DRAINAGE

4

A. Tributary Basins

There is a very small tributary basin to the east that could drain onto this property during major storm events. This small amount of storm runoff will be routed around this site and, since the runoff rate is very small, calculations for this are not provided.

B. Project Site

Since runoff calculations are provided for existing drainage in the FINAL DRAINAGE REPORT FOR TRAILER MANUFACTURING FACILITY, these calculations are not provided in this report.

A. Proposed Project Description and Drainage Plan

It is proposed to construct a truck and trailer service facility with associated parking and drives on this property. Access will be by a new private drive leading South, along the West line of Lot 1 to the existing access drive from County Road 8. Since this subject site is proposed to become a part of Lot 1, an easement for this access across Lot 1 will not be required.

The drainage plan for this project is to drain all portions of this site, having impervious surfaces, internally to storm inlets. A storm sewer system will collect runoff from these inlets and will discharge the runoff into an expanded retention pond, located west of this site in Lot 2. This pond will be expanded to provide storage for runoff from the Phase 1 and 2 developments. The storm sewer system is designed to convey runoff to the pond for the 100 year storm event.

Construction of the proposed private access drive along the west line of Lot 1 will eliminate a portion of the existing retention ponds that provide storage and water quality treatment for the Phase 1 site, SUMMIT BODYWORKS. A storm inlet with pipes will allow these existing ponds, which are reduced in size, to overflow into a swale leading to the expanded retention pond located on the north portion of Lot 2. The retention pond located on the north portion of Lot 2 will be expanded to provide additional storage for that volume of storage lost due to construction of the private access drive. The overflow storm pipes are designed to convey runoff reaching the existing pond for the 100 year storm event.

Other than revisions to the retention ponds, the planned construction of this Phase 3 development will have no affects upon the existing and planned drainage facilities within the Phase 1 and 2 developments.

B. Irrigation Ditches

The only irrigation ditches that are abandoned are those that are on-site and were used for irrigation of this subject property. All of the irrigation ditches along the perimeter of the site will remain functional.

C. Tributary Basins

There is a very small tributary basin to the east that could drain onto this property during major storm events. This small amount of storm runoff will be routed around this site and, since the runoff rate is very small, calculations for this are not provided.

D. Project Site

Runoff calculations are provided for 8 on-site, developed drainage basins, designated as basins D3-1 through D3-8 and for 4 onsite, design points, designated as design points A through D. Runoff calculations are also provided for two drainage basins located in the Phase 1 development, designated as basins D1-1 and D1-2, and for 2 drainage basins, designated as basins D2-1 and D2-2 and for a single design point, designated as design point E, located in the Phase 2 development.

Basin D3-1 contains 1.33 acres and consists of the northeast portion of the truck and trailer parking area located in the east portion of the site. This basin drains northwest to a 10 foot type R inlet, which discharges via the storm sewer system into the expanded retention pond located west of the site in Lot 2. The runoff rates for this basin are calculated to be 3.83 cfs, 4.87 cfs and 8.76 cfs for the 5, 10 and 100 year storms respectively.

Basin D3-2 contains 2.13 acres and consists of the southeast portion of the truck and trailer parking area located in the east portion of the site. This basin drains southwest to a 10 foot type R inlet, which discharges via the storm sewer system into the expanded retention pond located west of the site in Lot 2. The runoff rates for this basin are calculated to be 6.01 cfs, 7.66 cfs and 13.88 cfs for the 5, 10 and 100 year storms respectively.

Basin D3-3 contains 0.16 acres and consists of the roof over the southeast corner of the building and the area directly south of the proposed building. This basin drains south in a pipe to the storm sewer, which discharges into the expanded retention pond located west of the site in Lot 2. The runoff rates for this basin are calculated to be 2.73 cfs, 3.30 cfs and 5.63 cfs for the 5, 10 and 100 year storms respectively.

Basin D3-4 contains 0.66 acres and consists of the remaining roof area of the building. This basin drains west to the roof's gutters and into downspouts to a collection pipe that discharges into the storm sewer, which discharges into the expanded retention pond located west of the site in Lot 2. The runoff rates for this basin are calculated to be 2.73 cfs, 3.30 cfs and 5.63 cfs for the 5, 10 and 100 year storms respectively.

Basin D3-5 contains 0.37 acres and consists of portions of the private drive southwest of the building. Most of this area lies within the Phase 1 development and runs along the west edge of the remaining portion of the existing retention pond for phase 1. This basin drains internally into a 5 foot type R inlet that discharges, via a short length of storm sewer, into the remaining portion of the existing retention pond in Phase 1. As this pond fills and reaches a surface elevation of 53.0, it will overflow via a weir into the south portion of the remaining portion of the Phase 1 pond. Upon reaching a surface elevation of 56.2, the pond will overflow into a modified type D inlet that drains, via two 36 inch storm sewer pipes to a riprap lined swale that discharges into the expanded retention pond in Lot 2. The runoff rates for this basin are calculated to be 1.65 cfs, 2.20 cfs and 3.25 cfs for the 5, 10 and 100 year storms respectively.

Basin D3-6 contains 0.80 acres and consists of the automobile parking and drive area west of the building. This basin drains west to a 5 foot type R inlet, which discharges via a short length of storm sewer system into a riprap lined swale leading to the expanded retention pond located west of the site in Lot 2. The runoff rates for this basin are calculated to be 3.62 cfs, 4.37 cfs and 7.08 cfs for the 5, 10 and 100 year storms respectively.

Basin D3-7 contains 0.59 acres and consists of undeveloped and sloped areas, along the new west line of Lot 1, lying west of the automobile parking and drive area. This basin drains west by sheet flow into the expanded retention pond located west of the site in Lot 2. The runoff rates for this basin are calculated to be 0.04 cfs, 0.37 cfs and 1.92 cfs for the 5, 10 and 100 year storms respectively.

Basin D3-8 contains 0.26 acres and consists of the south portion of the private drive running along the west edge of the remaining portion of the existing retention pond for phase 1. This basin drains internally into a 5 foot type R inlet that discharges, via a short length of storm sewer, into the remaining portion of the existing retention pond in Phase 1. As this pond fills and reaches a surface elevation of 53.0, it will overflow via a weir into the north portion of the remaining portion of the Phase 1 pond. Upon reaching a surface elevation of 56.2, the pond will overflow into a modified type D inlet that drains, via two 36 inch storm sewer pipes to a riprap lined swale that discharges into the expanded retention pond in Lot 2. The runoff rates for this basin are calculated to be 1.19 cfs, 1.44 cfs and 2.32 cfs for the 5, 10 and 100 year storms respectively.

Basin D1-1 contains 7.39 acres and consists of the north and east portions of the Phase 1 (Summit Body Works) development. This basin drains north and west in concrete drainage pans and storm sewers into the remaining portion of the existing retention pond in Phase 1. As this pond fills and reaches a surface elevation of 53.0, it will overflow via a weir into the south portion of the remaining portion of the Phase 1 pond. Upon reaching a surface elevation of 56.2, the pond will overflow into a modified type D inlet that drains, via two 36 inch storm sewer pipes to a riprap lined swale that discharges into the expanded retention pond in Lot 2. The runoff rates for this basin are calculated to be 23.76 cfs, 30.09 cfs and 53.76 cfs for the 5, 10 and 100 year storms respectively.

Basin D1-2 contains 6.55 acres and consists of the south and central east portions of the Phase 1 (Summit Body Works) development. The Summit Body Works' building lies in this basin. This basin drains west in swales and in various storm sewers into the remaining portion of the existing retention pond in Phase 1. As this pond fills and reaches a surface elevation of 53.0, it will overflow via a weir into the north portion of the remaining portion of the Phase 1 pond. Upon reaching a surface elevation of 56.2, the pond will overflow into a modified type D inlet that drains, via two 36 inch storm sewer pipes to a riprap lined swale that discharges into the expanded retention pond in Lot 2. The runoff rates for this basin are calculated to be 18.72 cfs, 23.30 cfs and 41.78 cfs for the 5, 10 and 100 year storms respectively.

Basin D2-1 contains 10.14 acres and consists of the entire parking, drive and building area of the Phase 2 (Transwest Trailer Manufacturing Facility) development. This basin drains into various inlets and storm sewers that all discharge into the expanded retention pond in the north portion of Lot 2. The runoff rates for this basin are calculated to be 26.98 cfs, 33.99 cfs and 61.24 cfs for the 5, 10 and 100 year storms respectively.

Basin D2-2 contains 4.16 acres and consists of expanded retention pond area in the north part of the Phase 2 (Transwest Trailer Manufacturing Facility) development. This basin drains internally in the retention pond by sheet flow. The runoff rates for this basin are calculated to be 0.41 cfs, 3.42 cfs and 18.14 cfs for the 5, 10 and 100 year storms respectively.

Design point A is located in the storm sewer pipe leading west from inlet I3-2 to inlet I3-3. This storm sewer eventually discharges into the expanded retention pond in Lot 2. Runoff from basins D3-1 and D3-2, containing a total area of 3.46 acres, contribute runoff to this design point. The purpose of this design point is for design of the storm sewer. The runoff rates at this design point are calculated to be 9.30 cfs, 11.86 cfs and 21.38 cfs for the 5, 10 and 100 year storms respectively.

Design Point B is located in the storm sewer pipe leading west from I3-3 to MH3-1. This storm sewer eventually discharges into the expanded retention pond in Lot 2. Runoff from basins D3-1, D3-2 and D3-3 containing a total area of 3.62 acres, contribute runoff to this design point. The purpose of this design point is for design of the storm sewer. The runoff rates at this design point are calculated to be 9.79 cfs, 12.45 cfs and 22.39 cfs for the 5, 10 and 100 year storms respectively.

Design Point C is located in the storm sewer pipe leading west from inlet MH3-1 to MH3-2. This storm sewer eventually discharges into the expanded retention pond in Lot 2. Runoff from basins D3-1 through D3-4, containing a total area of 4.22 acres, contribute runoff to this design point. The purpose of this design point is for design of the storm sewer. The runoff rates at this design point are calculated to be 11.92 cfs, 15.01 cfs and 26.76 cfs for the 5, 10 and 100 year storms respectively.

Design Point D is located in the north part of the remaining portion of the existing retention pond in Phase 1 at the modified type D inlet. This two 36 inch storm sewer pipes from this inlet discharge into a riprap lined swale leading into the expanded retention pond in Lot 2. Runoff from basins D1-1, D1-2, D3-5 and D3-8, containing a total area of 18.16 acres, contribute runoff to this design point. The purpose of this design point is for design of the storm inlet and storm sewer pipes. The runoff rates at this design point are calculated to be 56.11 cfs, 68.97 cfs and 120.90 cfs for the 5, 10 and 100 year storms respectively.

Design Point E is located in the expanded retention pond lying west of this site in Phase 2. Runoff from basins D3-1 through D3-8, D1-1, D1-2, D2-1 and D2-2, containing a total of 34.54 acres contribute runoff to this design point. The purpose of this design point is for design of the emergency overflow weir for this pond. The runoff rates at this design point are calculated to be 74.64 cfs, 95.72 cfs and 179.95 cfs for the 5, 10 and 100 year storms respectively.

See **VIII. APPENDICES, "Drainage Calculations"** for supporting calculations.

Water quality enhancement and retention storage for this property, and for the storage volume lost in the Phase 1 development, are provided by a single expanded retention pond located in the north portion of Lot 2 in the Phase 2 development. The minimum storage volume of this expanded retention pond is calculated in accordance with the equation contained within Chapter 5 of Weld County's Engineering and Construction Criteria. (see **VII REFERENCES** for citation and **VIII. APPENDICES, "Equations"**).

The minimum required volume for this expanded retention pond is based on the storage requirements for the Phase 2 development plus the storage requirements for this Phase 3 development and to provide replacement storage for the storage volume lost within the Phase 1 development due to construction of the access drive. This required storage volume is calculated to be 730,266 cubic feet, which requires a water surface elevation of 48.36 feet, at a maximum depth of 5.36 feet for the 100 year storm event. Upon reaching a water surface elevation of 49.25 feet, the pond would overflow, through the overflow weir, onto the adjacent property to the west. This emergency overflow weir has an average length of 44 feet, a maximum depth of 1.25 feet and is designed to convey 100% of the runoff rate reaching the pond for the 100 year storm event. The top of the berm surrounding this pond has a minimum elevation of 50.50 feet. The pond's side slopes are at 4:1.

(See **VIII. APPENDICES, "Retention Pond Calculations"** for supporting calculations.)

F. Storm Sewers and Culverts

The drainage plan for this project is to drain all developed portions of this site, having impervious surfaces, internally to storm inlets. Storm sewers will collect runoff from these inlets and will discharge the runoff into the expanded retention pond located to the west in Lot 2. These storm sewers and inlets are designed to convey storm runoff to the retention pond for the 100 year storm event. The design of these storm sewers is based on the expanded retention pond to the west on Lot 2 having a depth as required for the pond to contain 50 percent of the maximum volume of water calculated for the 100 year storm event, which is greater than the volume in the pond that would occur at the time of maximum rate of flow in the storm sewers. Hydraulic grade line (HGL) calculations are provided for the storm sewer system.

Since the locations of the roof downspouts are not accurately known at this time and since it is not necessary for the roof downspout collection pipe to be designed for any specific storm event, design calculations are not provided for this collection pipe. In the event the roof gutters overflow during major storm events, the excess runoff will reach the inlet located on the west side of the parking area and will be discharged into the expanded retention pond to the west.

There are no proposed culverts for this development.

See **VIII. APPENDICES, "Storm Sewer Design"** for supporting calculations.

CONCLUSIONS

9

A. Compliance with Standards

It is believed that this report conforms with the Storm Drainage and Technical Criteria of Fort Lupton.

B. Impact on Surrounding Areas

Construction of the expanded retention pond will reduce the runoff rates onto the adjacent property to the west to much less than what the existing runoff rates are.

This development of this property as planned will not have any significant, adverse, drainage impact on surrounding properties.

Construction of the expanded retention pond will also provide water quality enhancement for this project.

VII. REFERENCES

10

Urban Drainage and Flood Control District's "Urban Storm Drainage Criteria Manual", last revised January, 2016.

City of Fort Lupton's "Storm Drainage and Technical Criteria".

Chapter 5, Weld County's "Engineering and Construction Criteria", dated April, 2012.

Subsurface Soil Investigation for Transwest, Phase 3, 13525 County Road 8, Fort Lupton, Colorado by Rocky Mountain Group, dated March 16, 2020, job no. 175226.

Final Drainage Report for Trailer Manufacturing Facility, by Edgar Jennings, dated March 11.

Final Drainage Report for Summit Body Works, by Edgar Jennings, last revised August 12, 2017.

First Amendment to Final Drainage Report for Summit Body Works, by Edgar Jennings, last revised September 28, 2017.

Second Amendment to Final Drainage Report for Summit Body Works, by Edgar Jennings, last revised February 16, 2018.

Equations**Storm Water Runoff ("Rational" Method)**

$$Q = CIA$$

Q = runoff rate (cfs)

C = runoff coefficient

I = storm intensity (in/hr)

A = drainage basin area (ac)

Time of Concentration (for determination of t)

$$T = T_i + T_t = 0.395(1.1 - C_5) L^{1/2} / S^{1/3} + L' / 60 v$$

Max T = (L + L') / 180 + 10, for urban development conditions

Max T = 45, for historic undeveloped conditions

Max L = 300 ft

T = time of concentration (min)

T_i = initial or overland flow time (min)

T_t = travel or channel flow time (min)

C₅ = runoff coefficient for 5 year storm

L = overland flow length (ft), 300 foot max

S = overland flow slope (%)

L' = channel flow length (ft)

v = ave velocity of channel flow (fps)

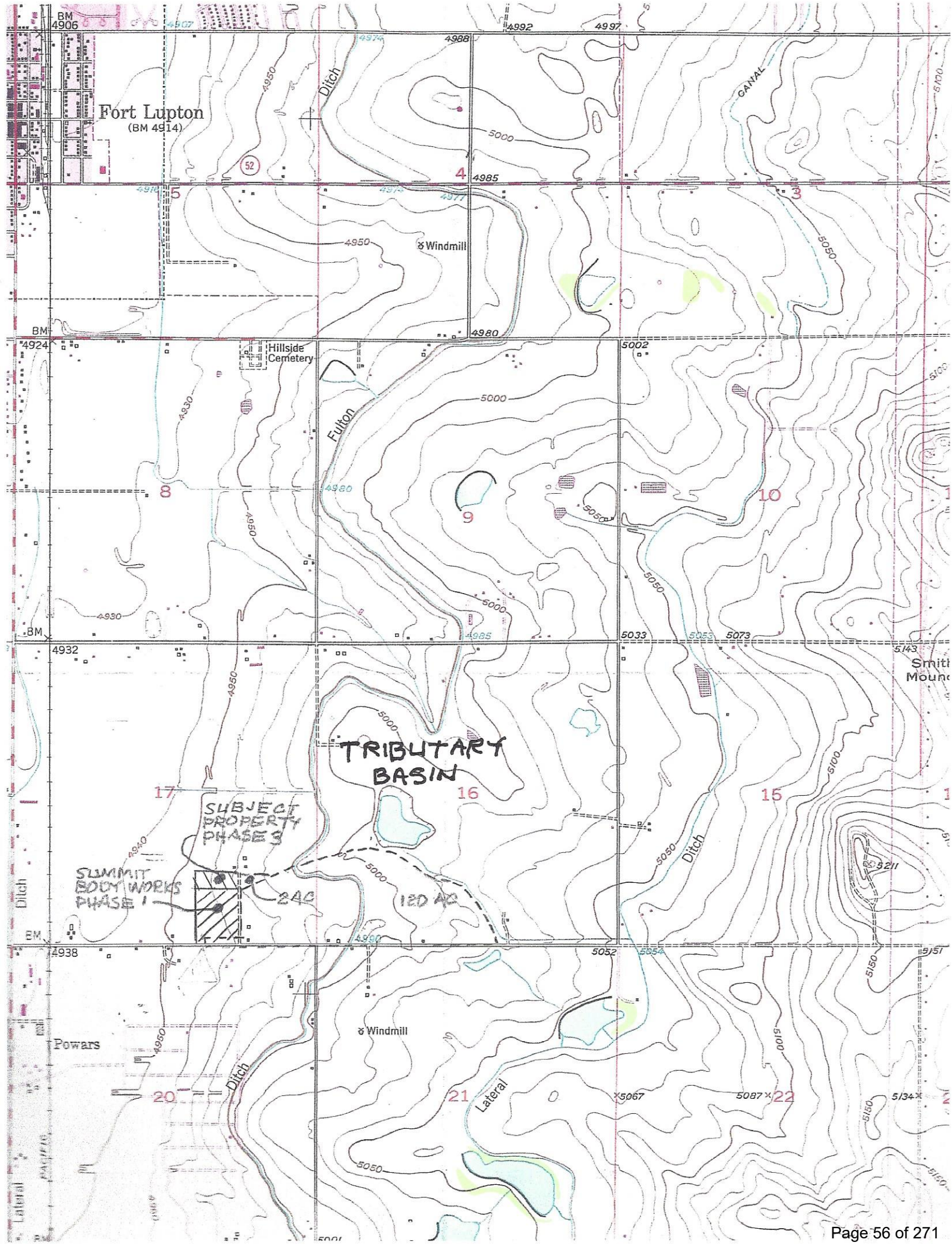
Minimum Storm Retention Pond Volume

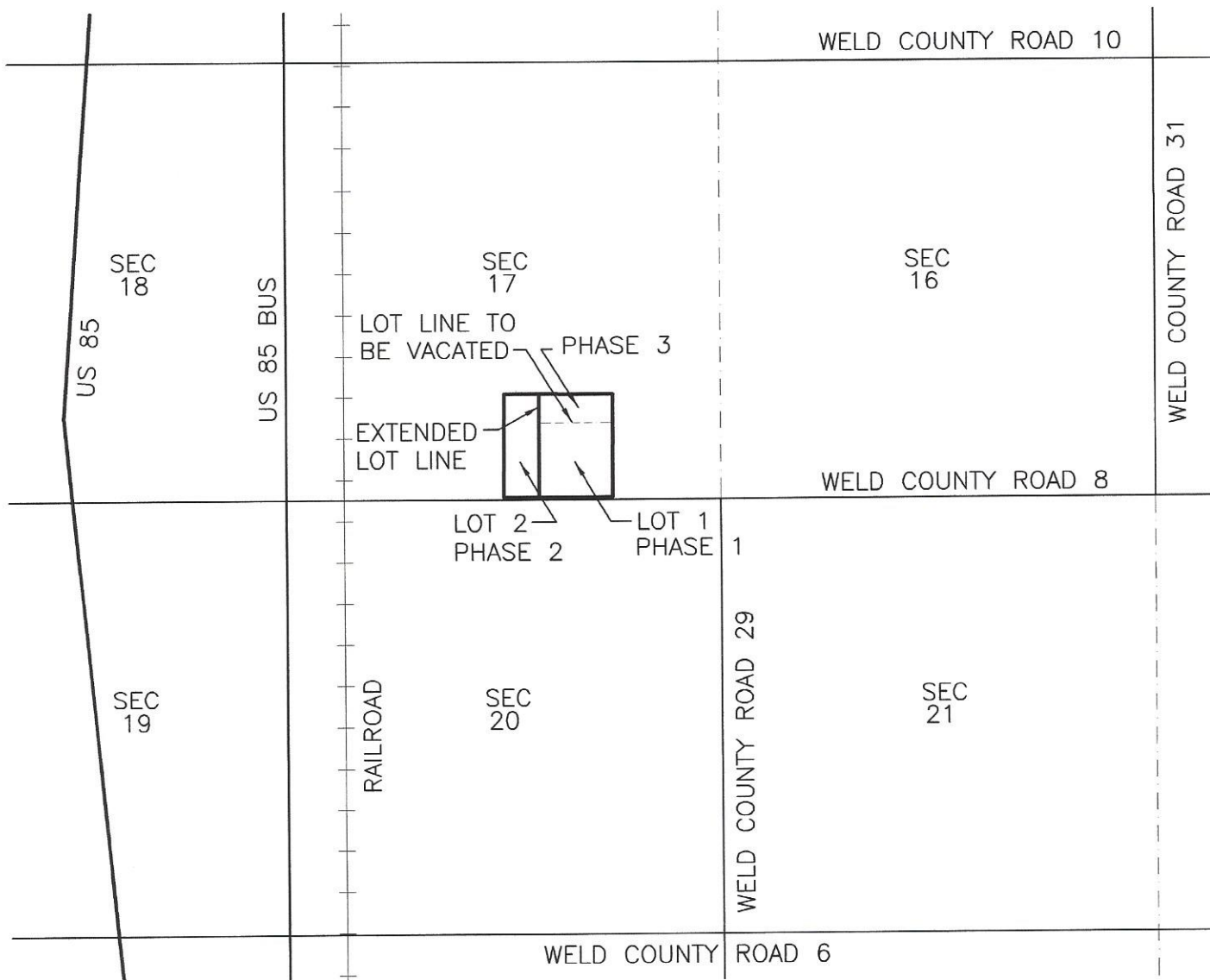
$$V = 1.5 \times (d/12) \times A \times 43560$$

V = minimum required volume (cu ft)

d = 24 hr 100 year rainfall depth (in)

A = basin area (ac)

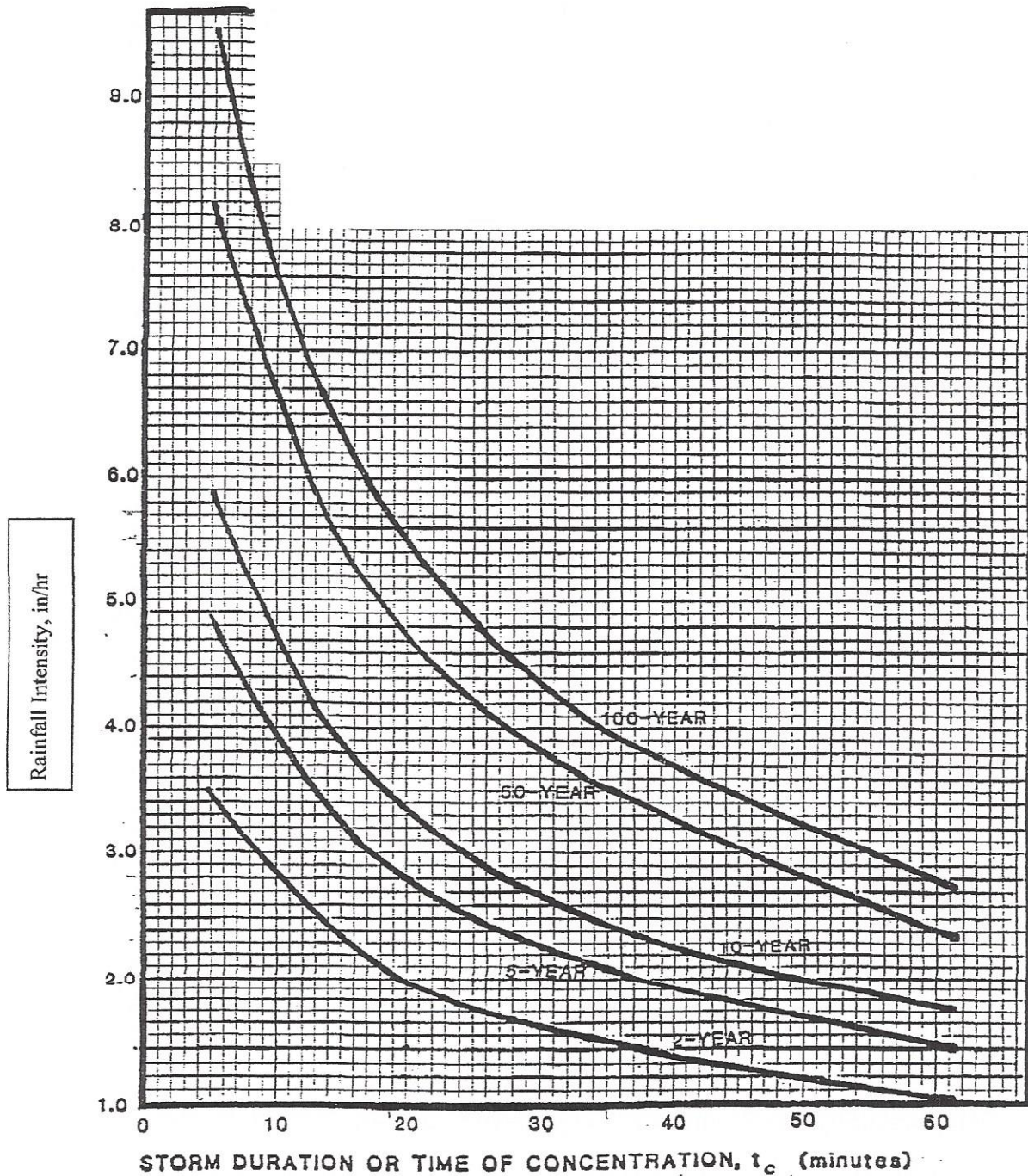




VICINITY MAP
1"=2000'

STORM RUNOFF CALCULATIONS

Figure 501
Time-Intensity-Frequency Curves
for the Rational Method



Reference: WRC Engineering, Inc. TM-1, November 1986

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

RAINFALL INTENSITIES "I" FOR ADAMS COUNTY:***STORM INTENSITIES ("I")***

Time min	5 yr in/hr	10 yr in/hr	100 yr in/hr	Time min	5 yr in/hr	10 yr in/hr	100 yr in/hr
5	4.92	5.88	9.48	31	2.20	2.61	4.21
6	4.70	5.62	9.05	32	2.16	2.57	4.14
7	4.49	5.35	8.62	33	2.13	2.52	4.07
8	4.27	5.09	8.18	34	2.09	2.47	4.00
9	4.06	4.82	7.75	35	2.05	2.43	3.93
10	3.84	4.56	7.32	36	2.01	2.38	3.86
11	3.72	4.42	7.09	37	1.97	2.33	3.79
12	3.60	4.27	6.86	38	1.94	2.28	3.72
13	3.48	4.13	6.62	39	1.90	2.24	3.65
14	3.36	3.98	6.39	40	1.86	2.19	3.58
15	3.24	3.84	6.16	41	1.83	2.16	3.53
16	3.14	3.73	5.98	42	1.81	2.13	3.48
17	3.04	3.62	5.80	43	1.78	2.11	3.44
18	2.94	3.50	5.63	44	1.75	2.08	3.39
19	2.84	3.39	5.45	45	1.73	2.05	3.34
20	2.74	3.28	5.27	46	1.70	2.02	3.29
21	2.68	3.20	5.15	47	1.67	1.99	3.24
22	2.62	3.11	5.03	48	1.64	1.97	3.20
23	2.56	3.03	4.92	49	1.62	1.94	3.15
24	2.50	2.94	4.80	50	1.59	1.91	3.10
25	2.44	2.86	4.68	51	1.57	1.89	3.06
26	2.40	2.82	4.60	52	1.56	1.86	3.02
27	2.36	2.78	4.52	53	1.54	1.84	2.98
28	2.32	2.74	4.44	54	1.52	1.82	2.94
29	2.28	2.70	4.36	55	1.51	1.80	2.91
30	2.24	2.66	4.28	56	1.49	1.77	2.87
				57	1.47	1.75	2.83
				58	1.45	1.73	2.79
				59	1.44	1.70	2.75
				60	1.42	1.68	2.71

Note: Intensities developed from Table 502 of Ft.
Lupton's Storm Drainage Design and Technical
Criteria Manual.

PERCENT IMPERVIOUSNESS AND RUNOFF COEFFICIENTS (TYPE C & D SOILS):

Land Use or Surface Characteristics	Percent Impervious	2	5	10	100
Business:					
Downtown	95	0.85	0.88	0.90	0.94
Suburban	75	0.67	0.70	0.76	0.85
Residential:					
Single-Family:					
2.5 ac or larger	12	0.11	0.16	0.33	0.59
0.75 ac to 2.5 ac	20	0.18	0.23	0.35	0.60
0.25 ac to 0.75 ac	30	0.27	0.31	0.42	0.64
0.25 ac or less	45	0.40	0.44	0.53	0.71
Apartments:					
Apartments	75	0.67	0.70	0.76	0.85
Industrial:					
Light Areas	80	0.71	0.75	0.79	0.87
Heavy Areas	90	0.80	0.83	0.87	0.91
Parks & Cemeteries:	10	0.09	0.14	0.27	0.55
Playgrounds:	25	0.22	0.27	0.39	0.62
Schools:	55	0.49	0.53	0.61	0.76
Railroad Yards:	50	0.45	0.49	0.57	0.73
Undeveloped Areas:					
Historic Flows, Sandy Soils	2	NA	NA	NA	NA
Historic Flows, Clayey Soils	2	0.02	0.07	0.22	0.52
Offsite Flows (Undefined Land Use)	45	0.40	0.44	0.53	0.71
Streets:					
Paved	100	0.89	0.92	0.94	0.96
Packed Gravel	40	0.36	0.40	0.50	0.69
Drives & Walks:	90	0.80	0.83	0.87	0.91
Roofs:	90	0.80	0.83	0.87	0.91
Lawns:					
Sandy Soil	2	NA	NA	NA	NA
Clayey Soil	2	0.02	0.07	0.22	0.52

Prepared from Urban Drainage & Flood Control District's "Urban Storm Drainage Criteria Manual, Volume 1", revised January 2016.

COMPOSITE RUNOFF COEFFICIENT "C" CALCULATIONS:

Equation: $C = (C1A1 + C2A2 + \dots)/(A1 + A2 + \dots)$

Basin or Des Pt	Ground Coverage	Area (ac)	C 5 yr	C 10 yr	C 100 yr
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DEVELOPED BASINS:

D3-1	Pavement	0.24	0.930	0.940	0.940
	Recycled Asphalt	1.09	0.660	0.720	0.830
	Roof	0.00	0.840	0.850	0.900
	Landscape	0.00	0.020	0.140	0.460

TOTAL		1.33	0.709	0.760	0.850
D3-2	Pavement	0.44	0.930	0.940	0.940
	Recycled Asphalt	1.62	0.660	0.720	0.830
	Roof	0.00	0.840	0.850	0.900
	Landscape	0.07	0.020	0.140	0.460

TOTAL		2.13	0.695	0.746	0.841
D3-3	Pavement	0.10	0.930	0.940	0.940
	Recycled Asphalt	0.00	0.660	0.720	0.830
	Roof	0.04	0.840	0.850	0.900
	Landscape	0.02	0.020	0.140	0.460

TOTAL		0.16	0.794	0.818	0.870
D3-4	Pavement	0.00	0.930	0.940	0.940
	Recycled Asphalt	0.00	0.660	0.720	0.830
	Roof	0.66	0.840	0.850	0.900
	Landscape	0.00	0.020	0.140	0.460

TOTAL		0.66	0.840	0.850	0.900
D3-5	Pavement	0.36	0.930	0.940	0.940
	Recycled Asphalt	0.00	0.660	0.720	0.830
	Roof	0.00	0.840	0.850	0.900
	Landscape	0.01	0.020	0.140	0.460

TOTAL		0.37	0.905	0.918	0.927

COMPOSITE RUNOFF COEFFICIENT "C" CALCULATIONS (Con't):

Basin or Des Pt	Ground Coverage	Area (ac)	C 5 yr	C 10 yr	C 100 yr
D3-6	Pavement	0.79	0.930	0.940	0.940
	Recycled Asphalt	0.00	0.660	0.720	0.830
	Roof	0.00	0.840	0.850	0.900
	Landscape	0.01	0.020	0.140	0.460

TOTAL		0.80	0.919	0.930	0.934
D3-7	Pavement	0.00	0.930	0.940	0.940
	Recycled Asphalt	0.00	0.660	0.720	0.830
	Roof	0.00	0.840	0.850	0.900
	Landscape	0.59	0.020	0.140	0.460

TOTAL		0.59	0.020	0.140	0.460
D3-8	Pavement	0.26	0.930	0.940	0.940
	Recycled Asphalt	0.00	0.660	0.720	0.830
	Roof	0.00	0.840	0.850	0.900
	Landscape	0.00	0.020	0.140	0.460

TOTAL		0.26	0.930	0.940	0.940
D1-1	Pavement	2.97	0.930	0.940	0.940
	Recycled Asphalt	3.81	0.660	0.720	0.830
	Roof	0.00	0.840	0.850	0.900
	Landscape	0.61	0.020	0.140	0.460

TOTAL		7.39	0.716	0.761	0.844
D1-2	Pavement	3.29	0.930	0.940	0.940
	Recycled Asphalt	0.00	0.660	0.720	0.830
	Roof	1.81	0.840	0.850	0.900
	Landscape	1.45	0.020	0.140	0.460

TOTAL		6.55	0.704	0.738	0.823
D2-1	Pavement	3.90	0.930	0.940	0.940
	Recycled Asphalt	2.79	0.660	0.720	0.830
	Roof	1.82	0.840	0.850	0.900
	Landscape	1.63	0.020	0.140	0.460

TOTAL		10.14	0.693	0.735	0.825

COMPOSITE RUNOFF COEFFICIENT "C" CALCULATIONS (Con't):

Basin or Des Pt	Ground Coverage	Area (ac)	C 5 yr	C 10 yr	C 100 yr
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DESIGN POINTS (DEVELOPED CONDITIONS):

A	D3-1	1.33	0.709	0.760	0.850
	D3-2	2.13	0.695	0.746	0.841

TOTAL		3.46	0.700	0.752	0.844
B	D3-1	1.33	0.709	0.760	0.850
	D3-2	2.13	0.695	0.746	0.841
	D3-3	0.16	0.794	0.818	0.870

TOTAL		3.62	0.704	0.754	0.845
C	D3-1	1.33	0.709	0.760	0.850
	D3-2	2.13	0.695	0.746	0.841
	D3-3	0.16	0.794	0.818	0.870
	D3-4	0.66	0.840	0.850	0.900

TOTAL		4.28	0.725	0.769	0.854
D	D3-5	0.37	0.905	0.918	0.927
	D3-8	0.26	0.930	0.940	0.940
	D1-1	7.39	0.840	0.850	0.900
	D2-1	10.14	0.693	0.735	0.825

TOTAL		18.16	0.761	0.788	0.859
E	D3-1	1.33	0.709	0.760	0.850
	D3-2	2.13	0.695	0.746	0.841
	D3-3	0.16	0.794	0.818	0.870
	D3-4	0.66	0.840	0.850	0.900
	D3-5	0.37	0.905	0.918	0.927
	D3-6	0.80	0.919	0.930	0.934
	D3-7	0.59	0.020	0.140	0.460
	D3-8	0.26	0.930	0.940	0.940
	D1-1	7.39	0.716	0.761	0.844
	D1-2	6.55	0.704	0.738	0.823
	D2-1	10.14	0.693	0.735	0.825
	D2-2	4.16	0.020	0.140	0.460

TOTAL		34.54	0.621	0.671	0.787

COMPOSITE RUNOFF COEFFICIENT "C" CALCULATIONS (Con't):

Basin or Des Pt	Ground Coverage	Area (ac)	C 5 yr	C 10 yr	C 100 yr
D2-2	Pavement	0.00	0.930	0.940	0.940
	Recycled Asphalt	0.00	0.660	0.720	0.830
	Roof	0.00	0.840	0.850	0.900
	Landscape	4.16	0.020	0.140	0.460

TOTAL		4.16	0.020	0.140	0.460

TIME OF CONCENTRATION "Tc" CALCULATIONS:

$$\text{Equations: } T_c = T_i + T_t = 0.395(1.1 - C_5)L^{1/2}/S^{1/3} + (L'/60)C_vS_w^{1/2}$$

Where: max $T_c = (L + L')/180 + 10$ for urban conditions
 max $T_c = 45$ for historic undeveloped conditions
 max $L = 500$ ft for rural land use
 max $L = 300$ ft for urban land use

Conveyance Coefficient C_v	
Land Surface	C_v
Heavy meadow	2.5
Tillage/field	5
Short pasture & lawns	7
Nearly bare ground	10
Grassed waterway	15
Paved areas shallow swales	20

Basin or Des Pt	L ft	Ti calcs		Ti min	L' ft	Sw %	Tt calcs		Tt min	max Tc min	Tc min
		C5	slope %				Cv	v ft/sec			
D3-1	300	0.71	3.0	8.6	80	3.0	20	13.4	0.1	13	9
					70	0.8	20	3.6	0.3		
D3-2	300	0.70	3.2	8.6	60	3.2	20	14.3	0.1	13	9
					105	0.8	20	3.6	0.5		
D3-3	70	0.79	1.2	4.5						10	5
D3-4	100	0.84	2.1	3.7	45	2.0	20	8.9	0.1	11	5
D3-5	37	0.91	1.6	1.8	290	1.3	20	5.8	0.8	12	5
D3-6	120	0.92	2.1	2.8	130	0.8	20	3.6	0.6	11	5
D3-7	145	0.02	11.1	10.7						11	11
D3-8	35	0.93	2.1	1.4	200	1.0	20	4.5	0.7	11	5
D1-1					FROM PHASE 1 DRAINAGE STUDY						7
D1-2					FROM PHASE 1 DRAINAGE STUDY						9
D2-1					FROM PHASE 2 DRAINAGE STUDY						10
D2-2					USE MIN VALUE						5

TIME OF CONCENTRATION "Tc" CALCULATIONS (Con't):

Basin or Des Pt	L ft	Ti calcs		Ti min	L' ft	Sw %	Tt calcs		Tt min	max Tc min	Tc min
		C5	slope %				Cv	v ft/sec			

DESIGN POINTS FOR STORM SEWER DESIGN (DEVELOPED CONDITIONS):

A	300	0.70	3.0	8.8	80	3.0	20	13.4	0.1	14	10
					70	0.8	20	3.6	0.3		
					338			5.3	1.1		
B	300	0.70	3.1	8.7	80	3.0	20	13.4	0.1	14	10
					70	0.8	20	3.6	0.3		
					338			5.3	1.1		
					148			7.2	0.3		
C	300	0.73	3.1	8.1	80	3.0	20	13.4	0.1	16	10
					70	0.8	20	3.6	0.3		
					338			5.3	1.1		
					148			7.2	0.3		
					83			7.5	0.2		

DESIGN POINTS FOR PHASE 1 OVERFLOW PIPE AND PHASE 2 OVERFLOW WEIR:

D	FROM PHASE 1 DRAINAGE STUDY										9
E	300	0.62	3.1	10.5	80	3.0	20	13.4	0.1	17	13
					70	0.8	20	3.6	0.3		
					338			5.3	1.1		
					148			7.2	0.3		
					83			7.5	0.2		
					132			6.1	0.4		
					76			6.1	0.2		

RUNOFF "Q" CALCULATIONS:Equation: $Q = CIA$ **5 YEAR STORM**

Basin or Design Point	A ac	T min	"C"	I in/hr	Q cfs
D3-1	1.33	9	0.709	4.06	3.83
D3-2	2.13	9	0.695	4.06	6.01
D3-3	0.16	5	0.794	4.92	0.63
D3-4	0.66	5	0.840	4.92	2.73
D3-5	0.37	5	0.905	4.92	1.65
D3-6	0.80	5	0.919	4.92	3.62
D3-7	0.59	11	0.020	3.72	0.04
D3-8	0.26	5	0.930	4.92	1.19
D1-1	7.39	7	0.716	4.49	23.76
D1-2	6.55	9	0.704	4.06	18.72
D2-1	10.14	10	0.693	3.84	26.98
D2-2	4.16	5	0.020	4.92	0.41

DESIGN POINTS (DEVELOPED CONDITIONS):

A	3.46	10	0.700	3.84	9.30
B	3.62	10	0.704	3.84	9.79
C	4.28	10	0.725	3.84	11.92
D	18.16	9	0.761	4.06	56.11
E	34.54	13	0.621	3.48	74.64

RUNOFF "Q" CALCULATIONS (Con't):**10 YEAR STORM**

Basin or Design Point	A ac	T min	"C"	I in/hr	Q cfs
D3-1	1.33	9	0.760	4.82	4.87
D3-2	2.13	9	0.746	4.82	7.66
D3-3	0.16	5	0.818	5.88	0.77
D3-4	0.66	5	0.850	5.88	3.30
D3-5	0.37	5	0.918	5.88	2.00
D3-6	0.80	5	0.930	5.88	4.37
D3-7	0.59	11	0.140	4.42	0.37
D3-8	0.26	5	0.940	5.88	1.44
D1-1	7.39	7	0.761	5.35	30.09
D1-2	6.55	9	0.738	4.82	23.30
D2-1	10.14	10	0.735	4.56	33.99
D2-2	4.16	5	0.140	5.88	3.42

DESIGN POINTS (DEVELOPED CONDITIONS):

A	3.46	10	0.752	4.56	11.86
B	3.62	10	0.754	4.56	12.45
C	4.28	10	0.769	4.56	15.01
D	18.16	9	0.788	4.82	68.97
E	34.54	13	0.671	4.13	95.72

RUNOFF "Q" CALCULATIONS (Con't):**100 YEAR STORM**

Basin or Design Point	A ac	T min	"C"	I in/hr	Q cfs
DEVELOPED BASINS (DEVELOPED CONDITIONS):					
D3-1	1.33	9	0.850	7.75	8.76
D3-2	2.13	9	0.841	7.75	13.88
D3-3	0.16	5	0.870	9.48	1.32
D3-4	0.66	5	0.900	9.48	5.63
D3-5	0.37	5	0.927	9.48	3.25
D3-6	0.80	5	0.934	9.48	7.08
D3-7	0.59	11	0.460	7.09	1.92
D3-8	0.26	5	0.940	9.48	2.32
D1-1	7.39	7	0.844	8.62	53.76
D1-2	6.55	9	0.823	7.75	41.78
D2-1	10.14	10	0.825	7.32	61.24
D2-2	4.16	5	0.460	9.48	18.14
DESIGN POINTS (DEVELOPED CONDITIONS):					
A	3.46	10	0.844	7.32	21.38
B	3.62	10	0.845	7.32	22.39
C	4.28	10	0.854	7.32	26.76
D	18.16	9	0.859	7.75	120.90
E	34.54	13	0.787	6.62	179.95

STORM RUNOFF SUMMARY TABLE														
BASIN OR DESIGN POINT		5 Year Storm					10 Year Storm			100 Year Storm				
		A ac	T min	C	I in/hr	Q cfs	C	I in/hr	Q cfs	C	I in/hr	Q cfs		
DEVELOPED BASINS (DEVELOPED CONDITIONS):														
	D3-1	1.33	9	0.709	4.06	3.83	0.760	4.82	4.87	0.850	7.75	8.76		
	D3-2	2.13	9	0.695	4.06	6.01	0.746	4.82	7.66	0.841	7.75	13.88		
	D3-3	0.16	5	0.794	4.92	0.63	0.818	5.88	0.77	0.870	9.48	1.32		
	D3-4	0.66	5	0.840	4.92	2.73	0.850	5.88	3.30	0.900	9.48	5.63		
	D3-5	0.37	5	0.905	4.92	1.65	0.918	5.88	2.20	0.927	9.48	3.25		
	D3-6	0.80	5	0.919	4.92	3.62	0.930	5.88	4.37	0.934	9.48	7.08		
	D3-7	0.59	11	0.020	3.72	0.04	0.140	4.42	0.37	0.460	7.09	1.92		
	D3-8	0.26	5	0.930	4.92	1.19	0.940	5.88	1.44	0.940	9.48	2.32		
	D1-1	7.39	7	0.716	4.49	23.76	0.761	5.35	30.09	0.844	8.62	53.76		
	D1-2	6.55	9	0.704	4.06	18.72	0.738	4.82	23.30	0.823	7.75	41.78		
	D2-1	10.14	10	0.693	3.84	26.98	0.735	4.56	33.99	0.825	7.32	61.24		
	D2-2	4.16	5	0.020	4.92	0.41	0.140	5.88	3.42	0.460	9.48	18.14		
DESIGN POINTS (DEVELOPED CONDITIONS):														
	A	3.46	10	0.700	3.84	9.30	0.752	4.56	11.86	0.844	7.32	21.38		
	B	3.62	10	0.704	3.84	9.79	0.754	4.56	12.45	0.845	7.32	22.39		
	C	4.22	10	0.725	3.84	11.92	0.769	4.56	15.01	0.854	7.32	26.76		
	D	18.16	9	0.761	4.06	56.11	0.788	4.82	68.97	0.859	7.75	120.90		
	E	34.54	13	0.621	3.72	74.64	0.671	4.42	95.72	0.787	7.09	178.95		

STORM SEWER CALCULATIONS

CIRCULAR PIPE STORM SEWER CAPACITY CALCULATIONS:

2/3 1/2

Equation: $Q = (1.486/n)AR^2 S$

Location	Length ft	n	dia in	A sq ft	S ft/ft	Basin/ Design Point	Q (100 yr) cfs	Q (capacity) cfs	V (full) ft/sec
I3-1 TO I3-2	338	0.013	18	1.7671	0.0080	D3-1	8.76	9.40	5.3
I3-2 TO I3-3	148	0.013	24	3.1416	0.0101	A	21.38	22.74	7.2
I3-3 TO MH3-1	83	0.013	24	3.1416	0.0108	B	22.39	23.51	7.5
ROOF DRAIN TO MH3-1	309	0.013	12	0.7854	0.0120 (max)	D3-4	5.63	3.90	5.0
MH3-1 TO MH3-2	132	0.013	30	4.9087	0.0053	C	26.76	29.86	6.1
MH3-2 TO DAYLIGHT	76	0.013	30	4.9087	0.0053	C	26.76	29.86	6.1
I3-4 to DAYLIGHT	54	0.013	15	1.2272	0.0263	D3-6	7.08	10.48	8.5
I3-5 to DAYLIGHT	35	0.013	15	1.2272	0.1140	D3-5	3.25	21.81	17.8
I3-6 to DAYLIGHT	35	0.013	15	1.2272	0.1140	D3-8	2.32	21.81	17.8
I3-7 to DAYLIGHT	108	0.013	36 (2 pipes)	7.0686	0.0083	D	120.90	121.53	17.2

TYPE R SUMP INLET ENTRANCE CAPACITY CALCULATIONS:

$$\text{Equation: } Q = CA(2gH)^{1/2}$$

where: H = depth - opening height/2

g = 32.2 ft/sec/sec

c = 0.62

Basin or Design Point	Inlet	Length ft	Opening Height ft	flowline depression ft	A sq ft	depth ft	H ft	Q (100 yr) cfs	v ft/sec
D3-1	I3-1	10.00	0.50	0.25	5.00	0.75	0.50	17.59	3.5
17.59 cfs > 8.76 cfs OK									
D3-2	I3-2	10.00	0.50	0.25	5.00	0.75	0.50	17.59	3.5
17.56 cfs > 13.88 cfs OK									
D3-3	I3-3	5.00	0.50	0.25	2.50	0.75	0.50	8.80	3.5
8.80 cfs > 1.32 cfs OK									
D3-6	I3-4	5.00	0.50	0.25	2.50	0.75	0.50	8.80	3.5
8.80 cfs > 7.08 cfs OK									
D3-5	I3-5	5.00	0.50	0.25	2.50	0.75	0.50	8.80	3.5
8.80 cfs > 3.25 cfs OK									
D3-8	I3-6	5.00	0.50	0.25	2.50	0.75	0.50	8.80	3.5
8.80 cfs > 2.32 cfs OK									

CIRCULAR PIPE ORIFICE CAPACITY CALCULATIONS:

$$\text{Equation: } Q = CA(2gH)^{1/2}$$

$$\text{where: } H = \text{depth} - \text{dia}/2$$

$$g = 32.2 \text{ ft/sec/sec}$$

Basin or Design Point	Inlet	C	Dia in	A sq ft	depth ft	H ft	Q cfs cfs	v ft/sec
D	I3-6	0.62	36.0 (2 pipes)	7.069	5.80	4.30	145.86	20.6

145.86 > 120.90 OK

TYPE D SUMP INLET POND DEPTH CALCULATIONS (STANDARD GRATE):

$$\text{Equation: } Q = CA(2gH)^{1/2}$$

where: H = depth (ft)

g = 32.2 ft/sec/sec

A = opening area = $13(5.33 \text{ in} \times 41 \text{ in})/144 = 19.72 \text{ sq ft}$

Basin or Design Point	Inlet	C	A sq ft	depth ft	Q (100 yr) cfs	v ft/sec
D	I3-7	0.62	19.72	1.80	131.64	6.7

131.64 > 120.90 OK

MODIFIED TYPE D INLET POND DEPTH CALCULATIONS (STANDARD GRATE):

$$\text{Equation: } Q = CA(2gH)^{1/2}$$

where: H = depth (ft)

g = 32.2 ft/sec/sec

A = opening area = $13(5.33 \text{ in} \times 41 \text{ in})/144 = 19.72 \text{ sq ft}$

Basin or Design Point	Inlet	C	A sq ft	depth ft	Q (100 yr) cfs	v ft/sec
D	I3-7	0.62	19.72	1.80	131.64	6.7

131.64 > 120.90 OK

HGL CALCULATIONS

Culvert Calculator Report MH3-2 to DAYLIGHT

Solve For: Headwater Elevation

Culvert Summary			
Allowable HW Elevation	60.30 ft	Headwater Depth/ Height	1.18
Computed Headwater Elevation	48.75 ft	Discharge	26.76 cfs
Inlet Control HW Elev	48.66 ft	Tailwater Elevation	46.01 ft
Outlet Control HW Elev	48.75 ft	Control Type	Outlet Control
Grades			
Upstream Invert	45.80 ft	Downstream Invert	45.40 ft
Length	76.00 ft	Constructed Slope	0.005263 ft/ft
Hydraulic Profile			
Profile	M2	Depth, Downstream	1.76 ft
Slope Type	Mild	Normal Depth	1.85 ft
Flow Regime	Subcritical	Critical Depth	1.76 ft
Velocity Downstream	7.23 ft/s	Critical Slope	0.005949 ft/ft
Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	2.50 ft
Section Size	30 inch	Rise	2.50 ft
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev	48.75 ft	Upstream Velocity Head	0.73 ft
Ke	0.50	Entrance Loss	0.37 ft
Inlet Control Properties			
Inlet Control HW Elev	48.66 ft	Flow Control	Unsubmerged
Inlet Type	Square edge w/headwall	Area Full	4.9 ft ²
K	0.00980	HDS 5 Chart	1
M	2.00000	HDS 5 Scale	1
C	0.03980	Equation Form	1
Y	0.67000		

Culvert Calculator Report MH3-1 to MH3-2

Solve For: Headwater Elevation

Culvert Summary			
Allowable HW Elevation	60.30 ft	Headwater Depth/ Height	1.18
Computed Headwater Elevation	53.85 ft	Discharge	26.76 cfs
Inlet Control HW Elev	53.76 ft	Tailwater Elevation	48.75 ft
Outlet Control HW Elev	53.85 ft	Control Type	Outlet Control
Grades			
Upstream Invert	50.90 ft	Downstream Invert	50.20 ft
Length	132.00 ft	Constructed Slope	0.005303 ft/ft
Hydraulic Profile			
Profile	M2	Depth, Downstream	1.76 ft
Slope Type	Mild	Normal Depth	1.85 ft
Flow Regime	Subcritical	Critical Depth	1.76 ft
Velocity Downstream	7.23 ft/s	Critical Slope	0.005949 ft/ft
Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	2.50 ft
Section Size	30 inch	Rise	2.50 ft
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev	53.85 ft	Upstream Velocity Head	0.74 ft
Ke	0.50	Entrance Loss	0.37 ft
Inlet Control Properties			
Inlet Control HW Elev	53.76 ft	Flow Control	Unsubmerged
Inlet Type	Square edge w/headwall	Area Full	4.9 ft ²
K	0.00980	HDS 5 Chart	1
M	2.00000	HDS 5 Scale	1
C	0.03980	Equation Form	1
Y	0.67000		

Culvert Calculator Report

I3-3 to MH3-1

Solve For: Headwater Elevation

Culvert Summary			
Allowable HW Elevation	60.30 ft	Headwater Depth/ Height	1.72
Computed Headwater Elevation	55.85 ft	Discharge	22.39 cfs
Inlet Control HW Elev	55.75 ft	Tailwater Elevation	53.85 ft
Outlet Control HW Elev	55.85 ft	Control Type	Outlet Control
Grades			
Upstream Invert	52.40 ft	Downstream Invert	51.50 ft
Length	83.00 ft	Constructed Slope	0.010843 ft/ft
Hydraulic Profile			
Profile	Pressure	Depth, Downstream	2.35 ft
Slope Type	N/A	Normal Depth	1.56 ft
Flow Regime	N/A	Critical Depth	1.69 ft
Velocity Downstream	7.13 ft/s	Critical Slope	0.009329 ft/ft
Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	2.00 ft
Section Size	24 inch	Rise	2.00 ft
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev	55.85 ft	Upstream Velocity Head	0.79 ft
Ke	0.50	Entrance Loss	0.39 ft
Inlet Control Properties			
Inlet Control HW Elev	55.75 ft	Flow Control	Submerged
Inlet Type	Square edge w/headwall	Area Full	3.1 ft ²
K	0.00980	HDS 5 Chart	1
M	2.00000	HDS 5 Scale	1
C	0.03980	Equation Form	1
Y	0.67000		

Culvert Calculator Report I3-2 to I3-3

Solve For: Headwater Elevation

Culvert Summary			
Allowable HW Elevation	60.30 ft	Headwater Depth/ Height	2.18
Computed Headwater Elevation	58.25 ft	Discharge	21.38 cfs
Inlet Control HW Elev	57.07 ft	Tailwater Elevation	55.85 ft
Outlet Control HW Elev	58.25 ft	Control Type	Outlet Control
Grades			
Upstream Invert	53.90 ft	Downstream Invert	52.40 ft
Length	148.00 ft	Constructed Slope	0.010135 ft/ft
Hydraulic Profile			
Profile	Pressure	Depth, Downstream	3.45 ft
Slope Type	N/A	Normal Depth	1.54 ft
Flow Regime	N/A	Critical Depth	1.65 ft
Velocity Downstream	6.81 ft/s	Critical Slope	0.008787 ft/ft
Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	2.00 ft
Section Size	24 inch	Rise	2.00 ft
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev	58.25 ft	Upstream Velocity Head	0.72 ft
Ke	0.50	Entrance Loss	0.36 ft
Inlet Control Properties			
Inlet Control HW Elev	57.07 ft	Flow Control	Submerged
Inlet Type	Square edge w/headwall	Area Full	3.1 ft ²
K	0.00980	HDS 5 Chart	1
M	2.00000	HDS 5 Scale	1
C	0.03980	Equation Form	1
Y	0.67000		

Culvert Calculator Report

I3-1 to I3-2

Solve For: Headwater Elevation

Culvert Summary			
Allowable HW Elevation	61.20 ft	Headwater Depth/ Height	2.58
Computed Headwater Elevation	61.17 ft	Discharge	8.76 cfs
Inlet Control HW Elev	59.28 ft	Tailwater Elevation	58.25 ft
Outlet Control HW Elev	61.17 ft	Control Type	Outlet Control
Grades			
Upstream Invert	57.30 ft	Downstream Invert	54.60 ft
Length	338.00 ft	Constructed Slope	0.007988 ft/ft
Hydraulic Profile			
Profile	Pressure	Depth, Downstream	3.65 ft
Slope Type	N/A	Normal Depth	1.15 ft
Flow Regime	N/A	Critical Depth	1.15 ft
Velocity Downstream	4.96 ft/s	Critical Slope	0.008022 ft/ft
Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	1.50 ft
Section Size	18 inch	Rise	1.50 ft
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev	61.17 ft	Upstream Velocity Head	0.38 ft
Ke	0.50	Entrance Loss	0.19 ft
Inlet Control Properties			
Inlet Control HW Elev	59.28 ft	Flow Control	Submerged
Inlet Type	Square edge w/headwall	Area Full	1.8 ft²
K	0.00980	HDS 5 Chart	1
M	2.00000	HDS 5 Scale	1
C	0.03980	Equation Form	1
Y	0.67000		

Culvert Calculator Report

I3-4 to DAYLIGHT

Solve For: Headwater Elevation

Culvert Summary			
Allowable HW Elevation	59.42 ft	Headwater Depth/ Height	1.72
Computed Headwater Elevation	56.57 ft	Discharge	7.08 cfs
Inlet Control HW Elev	56.57 ft	Tailwater Elevation	46.01 ft
Outlet Control HW Elev	56.43 ft	Control Type	Inlet Control
Grades			
Upstream Invert	54.42 ft	Downstream Invert	53.00 ft
Length	54.00 ft	Constructed Slope	0.026296 ft/ft
Hydraulic Profile			
Profile	S2	Depth, Downstream	0.77 ft
Slope Type	Steep	Normal Depth	0.75 ft
Flow Regime	Supercritical	Critical Depth	1.07 ft
Velocity Downstream	8.93 ft/s	Critical Slope	0.011270 ft/ft
Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	1.25 ft
Section Size	15 inch	Rise	1.25 ft
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev	56.43 ft	Upstream Velocity Head	0.63 ft
Ke	0.50	Entrance Loss	0.31 ft
Inlet Control Properties			
Inlet Control HW Elev	56.57 ft	Flow Control	Submerged
Inlet Type	Square edge w/headwall	Area Full	1.2 ft²
K	0.00980	HDS 5 Chart	1
M	2.00000	HDS 5 Scale	1
C	0.03980	Equation Form	1
Y	0.67000		

Culvert Calculator Report I3-5 to DAYLIGHT

Solve For: Headwater Elevation

Culvert Summary			
Allowable HW Elevation	58.00 ft	Headwater Depth/ Height	3.96
Computed Headwater Elevation	57.95 ft	Discharge	3.25 cfs
Inlet Control HW Elev	57.70 ft	Tailwater Elevation	57.70 ft
Outlet Control HW Elev	57.95 ft	Control Type	Outlet Control
Grades			
Upstream Invert	53.00 ft	Downstream Invert	49.00 ft
Length	35.00 ft	Constructed Slope	0.114286 ft/ft
Hydraulic Profile			
Profile	Pressure	Depth, Downstream	8.70 ft
Slope Type	N/A	Normal Depth	0.33 ft
Flow Regime	N/A	Critical Depth	0.73 ft
Velocity Downstream	2.65 ft/s	Critical Slope	0.006191 ft/ft
Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	1.25 ft
Section Size	15 inch	Rise	1.25 ft
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev	57.95 ft	Upstream Velocity Head	0.11 ft
Ke	0.50	Entrance Loss	0.05 ft
Inlet Control Properties			
Inlet Control HW Elev	57.70 ft	Flow Control	Unsubmerged
Inlet Type	Square edge w/headwall	Area Full	1.2 ft ²
K	0.00980	HDS 5 Chart	1
M	2.00000	HDS 5 Scale	1
C	0.03980	Equation Form	1
Y	0.67000		

Culvert Calculator Report

I3-6 to DAYLIGHT

Solve For: Headwater Elevation

Culvert Summary			
Allowable HW Elevation	58.00 ft	Headwater Depth/ Height	3.86
Computed Headwater Elevation	57.83 ft	Discharge	2.32 cfs
Inlet Control HW Elev	57.70 ft	Tailwater Elevation	57.70 ft
Outlet Control HW Elev	57.83 ft	Control Type	Outlet Control
Grades			
Upstream Invert	53.00 ft	Downstream Invert	49.00 ft
Length	35.00 ft	Constructed Slope	0.114286 ft/ft
Hydraulic Profile			
Profile	Pressure	Depth, Downstream	8.70 ft
Slope Type	N/A	Normal Depth	0.28 ft
Flow Regime	N/A	Critical Depth	0.61 ft
Velocity Downstream	1.89 ft/s	Critical Slope	0.005644 ft/ft
Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	1.25 ft
Section Size	15 inch	Rise	1.25 ft
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev	57.83 ft	Upstream Velocity Head	0.06 ft
Ke	0.50	Entrance Loss	0.03 ft
Inlet Control Properties			
Inlet Control HW Elev	57.70 ft	Flow Control	Unsubmerged
Inlet Type	Square edge w/headwall	Area Full	1.2 ft ²
K	0.00980	HDS 5 Chart	1
M	2.00000	HDS 5 Scale	1
C	0.03980	Equation Form	1
Y	0.67000		

Culvert Calculator Report

I3-7 to DAYLIGHT

Solve For: Headwater Elevation

Culvert Summary			
Allowable HW Elevation	58.00 ft	Headwater Depth/ Height	1.65
Computed Headwater Elevation	57.14 ft	Discharge	121.53 cfs
Inlet Control HW Elev	57.14 ft	Tailwater Elevation	46.01 ft
Outlet Control HW Elev	56.86 ft	Control Type	Inlet Control
Grades			
Upstream Invert	52.20 ft	Downstream Invert	51.30 ft
Length	108.00 ft	Constructed Slope	0.008333 ft/ft
Hydraulic Profile			
Profile	S2	Depth, Downstream	2.45 ft
Slope Type	Steep	Normal Depth	2.45 ft
Flow Regime	Supercritical	Critical Depth	2.52 ft
Velocity Downstream	9.82 ft/s	Critical Slope	0.007985 ft/ft
Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	3.00 ft
Section Size	36 inch	Rise	3.00 ft
Number Sections	2		
Outlet Control Properties			
Outlet Control HW Elev	56.86 ft	Upstream Velocity Head	1.43 ft
Ke	0.50	Entrance Loss	0.72 ft
Inlet Control Properties			
Inlet Control HW Elev	57.14 ft	Flow Control	Submerged
Inlet Type	Square edge w/headwall	Area Full	14.1 ft ²
K	0.00980	HDS 5 Chart	1
M	2.00000	HDS 5 Scale	1
C	0.03980	Equation Form	1
Y	0.67000		

RETENTION POND CALCULATIONS

File No: NOAA

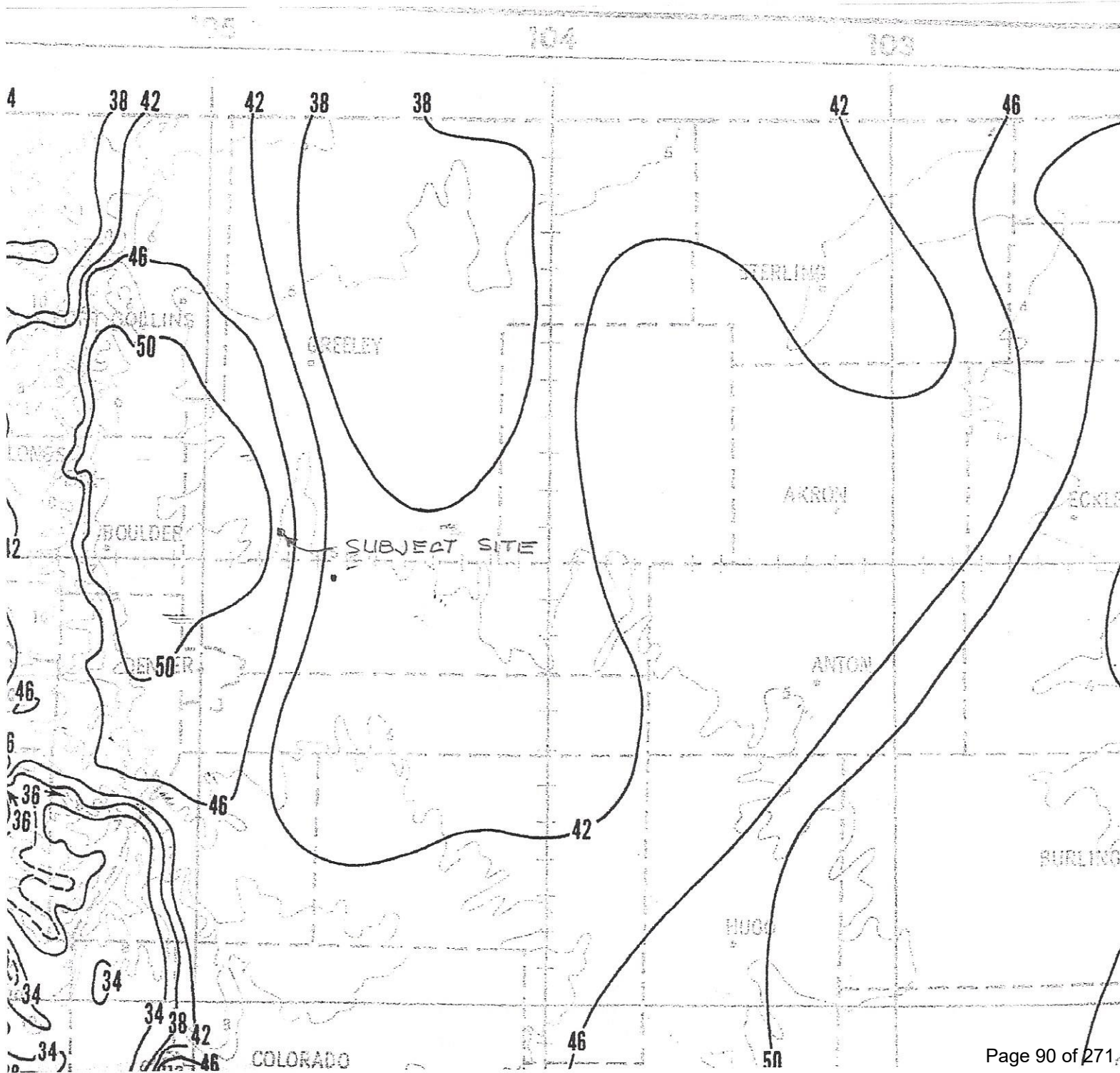
**STATE OF COLORADO'S
ISOPLUVIALS OF 100-YR 24-HR PRECIPITATION IN TENTHS OF AN INCH (EXCERPT)**

NOAA ATLAS 2, Volume III

by
U.S. Department of Commerce



scale: 1" = 21 miles



RETENTION POND DEPTH/VOLUME CALCULATIONS, PHASE 1 PONDS:

$$\text{Equation: Vol} = (d2-d1) \times (A2+A3 + \frac{1}{2} \times (d3-d2) \times (A3+A2 + (A2 \times A3)^{1/3} + \dots$$

Elevation ft	Depth ft	SOUTH PORTION VOLUME CALCS				NORTH PORTION VOLUME CALCS				TOTAL VOLUME
		Surface Area sq ft	Incr Volume cu ft	Cum Volume cu ft	Depth ft	Surface Area sq ft	Incr Volume cu ft	Cum Volume cu ft		
48.00	0.00	4860	0	0	0.00	4861	0	0	0	
48.10	0.10	5199	503	503	0.10	4536	470	470	972	
48.20	0.20	5537	537	1039	0.20	4211	437	907	1946	
48.30	0.30	5876	570	1610	0.30	3887	405	1312	2922	
48.40	0.40	6214	604	2214	0.40	3562	372	1684	3898	
48.50	0.50	6553	638	2852	0.50	3237	340	2024	4876	
48.60	0.60	6891	672	3524	0.60	2912	307	2331	5855	
48.70	0.70	7230	706	4230	0.70	2587	275	2606	6836	
48.80	0.80	7568	740	4970	0.80	2263	242	2848	7818	
48.90	0.90	7907	774	5744	0.90	1938	210	3058	8802	
49.00	1.00	8245	807	6551	1.00	1613	177	3235	9786	
49.10	1.10	8587	841	7393	1.10	1697	165	3401	10793	
49.20	1.20	8930	876	8268	1.20	1781	174	3574	11843	
49.30	1.30	9272	910	9178	1.30	1865	182	3757	12935	
49.40	1.40	9615	944	10122	1.40	1949	191	3947	14070	
49.50	1.50	9957	978	11101	1.50	2033	199	4146	15247	
49.60	1.60	10299	1013	12114	1.60	2116	207	4354	16467	
49.70	1.70	10642	1047	13160	1.70	2200	216	4570	17730	
49.80	1.80	10984	1081	14242	1.80	2284	224	4794	19035	
49.90	1.90	11327	1115	15357	1.90	2368	233	5026	20383	
50.00	2.00	11669	1150	16507	2.00	2452	241	5267	21774	
50.10	2.10	11477	1157	17664	2.10	2543	250	5517	23181	
50.20	2.20	11286	1138	18802	2.20	2634	259	5776	24578	
50.30	2.30	11094	1119	19921	2.30	2726	268	6044	25965	
50.40	2.40	10903	1100	21020	2.40	2817	277	6321	27341	
50.50	2.50	10711	1081	22101	2.50	2908	286	6607	28708	
50.60	2.60	10519	1061	23162	2.60	2999	295	6902	30065	
50.70	2.70	10328	1042	24205	2.70	3090	304	7207	31412	
50.80	2.80	10136	1023	25228	2.80	3182	314	7520	32748	
50.90	2.90	9945	1004	26232	2.90	3273	323	7843	34075	
51.00	0.00	15501	-36596	-10364	3.00	3364	332	8175	-2189	

RETENTION POND DEPTH/VOLUME CALCULATIONS, PHASE 1 PONDS (Con't):

Elevation ft	SOUTH PORTION VOLUME CALCS				NORTH PORTION VOLUME CALCS				TOTAL VOLUME
	Depth ft	Surface Area sq ft	Incr Volume cu ft	Cum Volume cu ft	Depth ft	Surface Area sq ft	Incr Volume cu ft	Cum Volume cu ft	
51.10	0.10	15893	1569	-8795	3.10	3472	342	8517	-278
51.20	0.20	16285	1609	-7186	3.20	3579	353	8869	1683
51.30	0.30	16676	1648	-5538	3.30	3687	363	9232	3694
51.40	0.40	17068	1687	-3851	3.40	3795	374	9606	5755
51.50	0.50	17460	1726	-2125	3.50	3903	385	9991	7866
51.60	0.60	17852	1765	-359	3.60	4010	396	10387	10027
51.70	0.70	18244	1805	1445	3.70	4118	406	10793	12238
51.80	0.80	18635	1844	3289	3.80	4226	417	11210	14499
51.90	0.90	19027	1883	5172	3.90	4333	428	11638	16810
52.00	1.00	19419	1922	7094	4.00	4441	439	12077	19171
52.10	1.10	19878	1965	9058	4.10	4566	450	12527	21586
52.20	1.20	20337	2010	11069	4.20	4691	463	12990	24059
52.30	1.30	20795	2056	13125	4.30	4817	475	13465	26591
52.40	1.40	21254	2102	15228	4.40	4942	488	13953	29181
52.50	1.50	21713	2148	17376	4.50	5067	500	14454	31829
52.60	1.60	22172	2194	19570	4.60	5192	513	14966	34536
52.70	1.70	22631	2240	21809	4.70	5317	525	15492	37301
52.80	1.80	23089	2286	24095	4.80	5443	538	16030	40125
52.90	1.90	23548	2332	26427	4.90	5568	550	16580	43007
53.00	2.00	24007	2377	28804	5.00	5693	563	17143	45948
53.10	2.10	24475	2424	31228	5.10	5824	576	17719	48947
53.20	2.20	24944	2471	33699	5.20	5954	589	18308	52007
53.30	2.30	25412	2518	36216	5.30	6085	602	18910	55126
53.40	2.40	25881	2564	38781	5.40	6215	615	19525	58305
53.50	2.50	26349	2611	41392	5.50	6346	628	20153	61544
53.60	2.60	26817	2658	44050	5.60	6477	641	20794	64844
53.70	2.70	27286	2705	46755	5.70	6607	654	21448	68203
53.80	2.80	27754	2752	49506	5.80	6738	667	22115	71621
53.90	2.90	28223	2799	52305	5.90	6868	680	22795	75100
54.00	3.00	28691	2845	55150	6.00	6999	693	23489	78639

RETENTION POND DEPTH/VOLUME CALCULATIONS, PHASE 1 PONDS (Con't):

Elevation ft	SOUTH PORTION VOLUME CALCS					NORTH PORTION VOLUME CALCS					TOTAL VOLUME
	Depth ft	Surface Area sq ft	Incr Volume cu ft	Cum Volume cu ft	Depth ft	Surface Area sq ft	Incr Volume cu ft	Cum Volume cu ft	Cum Volume cu ft		
54.10	3.10	29224	2895	58046	6.10	7115	706	24194	82240		
54.20	3.20	29757	2949	60994	6.20	7232	717	24911	85906		
54.30	3.30	30290	3002	63996	6.30	7348	729	25640	89637		
54.40	3.40	30823	3055	67052	6.40	7464	741	26381	93433		
54.50	3.50	31357	3109	70160	6.50	7581	752	27133	97293		
54.60	3.60	31890	3162	73322	6.60	7697	764	27897	101219		
54.70	3.70	32423	3215	76538	6.70	7813	775	28672	105210		
54.80	3.80	32956	3269	79806	6.80	7929	787	29459	109265		
54.90	3.90	33489	3322	83128	6.90	8046	799	30258	113386		
55.00	4.00	34022	3375	86503	7.00	8162	810	31068	117571		
55.10	4.10	34527	3427	89930	7.10	8289	822	31891	121821		
55.20	4.20	35033	3478	93408	7.20	8417	835	32726	126134		
55.30	4.30	35538	3528	96936	7.30	8544	848	33574	130510		
55.40	4.40	36044	3579	100515	7.40	8671	861	34434	134949		
55.50	4.50	36549	3629	104144	7.50	8799	873	35308	139452		
55.60	4.60	37054	3680	107824	7.60	8926	886	36194	144018		
55.70	4.70	37560	3730	111554	7.70	9053	899	37093	148647		
55.80	4.80	38065	3781	115335	7.80	9180	912	38004	153339		
55.90	4.90	38571	3831	119166	7.90	9308	924	38929	158095		
56.00	5.00	39076	3882	123048	8.00	9435	937	39866	162914		
56.10	5.10	39574	3932	126980	8.10	9564	950	40816	167796		
56.20	5.20	40073	3982	130962	8.20	9693	963	41778	172741		
56.30	5.30	40571	4032	134994	8.30	9822	976	42754	177748		
56.40	5.40	41069	4082	139076	8.40	9951	989	43742	182818		
56.50	5.50	41568	4131	143207	8.50	10080	1001	44744	187951		
56.60	5.60	42066	4181	147388	8.60	10208	1014	45758	193146		
56.70	5.70	42564	4231	151619	8.70	10337	1027	46785	198405		
56.80	5.80	43062	4281	155900	8.80	10466	1040	47825	203726		
56.90	5.90	43561	4331	160231	8.90	10595	1053	48878	209109		
57.00	6.00	44059	4381	164611	9.00	10724	1066	49944	214556		

RETENTION POND DEPTH/VOLUME CALCULATIONS, PHASE 1 PONDS (Con't):

Elevation ft	SOUTH PORTION VOLUME CALCS					NORTH PORTION VOLUME CALCS					TOTAL VOLUME	
	Depth ft	Surface Area sq ft	Incr Volume cu ft	Cum Volume cu ft	Depth ft	Surface Area sq ft	Incr Volume cu ft	Cum Volume cu ft	Depth ft	Surface Area sq ft	Incr Volume cu ft	Cum Volume cu ft
57.10	6.10	44557	4430	169042	9.10	10853	1079	51023	220065			
57.20	6.20	45056	4480	173522	9.20	10982	1092	52115	225636			
57.30	6.30	45554	4530	178052	9.30	11111	1105	53219	231271			
57.40	6.40	46052	4580	182632	9.40	11240	1117	54336	236968			
57.50	6.50	46551	4630	187261	9.50	11369	1130	55467	242728			
57.60	6.60	47049	4679	191941	9.60	11497	1143	56610	248551			
57.70	6.70	47547	4729	196670	9.70	11626	1156	57766	254436			
57.80	6.80	48045	4779	201449	9.80	11755	1169	58935	260384			
57.90	6.90	48544	4829	206278	9.90	11884	1182	60117	266395			
58.00	7.00	49085	4881	211159	10.00	12086	1198	61315	272474			

Pond Data

Ponding Description	Volume cu ft	Surface Elevation	Depth ft
capacity to overflow inlet	172,741	56.20	8.20

RETENTION POND VOLUME CALCULATIONS:

Total All aphaes

Equation: $\text{Vol} = 1.5(\text{RF}/12)(A)(43560)$ per Weld County Drainage Criteria

where: A = basin area in acres

RF = 100 year, 24 hour rainfall (in) = 4.8 in

Pond No.	Rainfall in	Area ac	vol cu ft
Phases 1, 2 & 3 (total project requirement)	4.80	34.54	902737
Phase 1 Pond (volume available to overflow inlet)			172,471

Phase 2 pond required volume			730,266

Note:

The 100 year, 24 hour rainfall depth is taken from figure 31, NOAA Atlas 2, Volume III

RETENTION POND VOLUME CALCULATIONS:

Total All aphaes

Equation: $\text{Vol} = 1.5(\text{RF}/12)(\text{A})(43560)$ per Weld County Drainage Criteria

where: A = basin area in acres

RF = 100 year, 24 hour rainfall (in) = 4.8 in

Pond No.	Rainfall in	Area ac	vol cu ft
Phases 1, 2 & 3 (total project requirement)	4.80	34.54	902737
Phase 1 Pond (volume available to overflow inlet)			164,490

Phase 2 required volume			738,247

Note:

The 100 year, 24 hour rainfall depth is taken from figure 31, NOAA Atlas 2, Volume III

RETENTION POND DEPTH/VOLUME CALCULATIONS, PHASE 2:

$$\text{Equation: Vol} = (d_2 - d_1) \left(A_1 + A_2 + \frac{A_1 \times A_2}{2} \right) / 3 + (d_3 - d_2) \left(A_3 + A_2 + \frac{A_2 \times A_3}{2} \right) / 3 + \dots$$

Elevation ft	Depth ft	Surface Area sq ft	Incr Volume cu ft	Cum Volume cu ft
43.00	0.00	22,004	0	0
43.10	0.10	33,344	2748	2748
43.20	0.20	44,683	3887	6635
43.30	0.30	56,023	5024	11659
43.40	0.40	67,362	6160	17819
43.50	0.50	78,702	7295	25114
43.60	0.60	90,041	8430	33544
43.70	0.70	101,381	9565	43108
43.80	0.80	112,720	10699	53807
43.90	0.90	124,060	11833	65640
44.00	1.00	135,399	12967	78608
44.10	1.10	136,123	13575	92183
44.20	1.20	136,846	13647	105830
44.30	1.30	137,570	13719	119549
44.40	1.40	138,294	13792	133341
44.50	1.50	139,018	13864	147205
44.60	1.60	139,741	13937	161142
44.70	1.70	140,465	14009	175151
44.80	1.80	141,189	14081	189232
44.90	1.90	141,912	14154	203385
45.00	2.00	142,636	14226	217611
45.10	2.10	143,227	14292	231903
45.20	2.20	143,818	14351	246254
45.30	2.30	144,408	14410	260664
45.40	2.40	144,999	14469	275133
45.50	2.50	145,590	14528	289661
45.60	2.60	146,181	14587	304248
45.70	2.70	146,772	14646	318894
45.80	2.80	147,362	14705	333599
45.90	2.90	147,953	14764	348363
46.00	3.00	148,544	14823	363187
46.10	3.10	149,152	14883	378070
46.20	3.20	149,760	14944	393014
46.30	3.30	150,367	15005	408019
46.40	3.40	150,975	15066	423085
46.50	3.50	151,583	15126	438211
46.60	3.60	152,191	15187	453398
46.70	3.70	152,799	15248	468646
46.80	3.80	153,406	15309	483955
46.90	3.90	154,014	15369	499324
47.00	4.00	154,622	15430	514754

RETENTION POND DEPTH/VOLUME CALCULATIONS, PHASE 2: (Con't)

Elevation ft	Depth ft	Surface Area sq ft	Incr Volume cu ft	Cum Volume cu ft
47.10	4.10	155,231	15491	530246
47.20	4.20	155,839	15552	545797
47.30	4.30	156,448	15613	561410
47.40	4.40	157,057	15674	577084
47.50	4.50	157,666	15735	592818
47.60	4.60	158,274	15795	608614
47.70	4.70	158,883	15856	624470
47.80	4.80	159,492	15917	640387
47.90	4.90	160,100	15978	656365
48.00	5.00	160,709	16039	672404
48.10	5.10	161,325	16100	688504
48.20	5.20	161,940	16162	704666
48.30	5.30	162,556	16223	720889
48.40	5.40	163,171	16285	737174
48.50	5.50	163,787	16346	753520
48.60	5.60	164,402	16408	769928
48.70	5.70	165,018	16469	786397
48.80	5.80	165,633	16531	802928
48.90	5.90	166,249	16592	819520
49.00	6.00	166,864	16654	836174
49.10	6.10	167,495	16716	852890
49.20	6.20	168,126	16779	869670
49.30	6.30	168,757	16842	886512
49.40	6.40	169,388	16906	903418
49.50	6.50	170,019	16969	920386
49.60	6.60	170,650	17032	937418
49.70	6.70	171,281	17095	954513
49.80	6.80	171,912	17158	971671
49.90	6.90	172,543	17221	988892
50.00	7.00	173,174	17284	1006176

Pond Data

Ponding Description	Volume cu ft	Surface Elevation	Depth ft
100 Year Storm (Based on Phase1 overflow inlet elevation of 56.20)	730,266	48.36	5.36
50% of 100 Year Storm (Based on Phase1 overflow inlet elevation of 56.20)	365,133	46.01	3.01

HORIZONTAL WIER CAPACITY CALCULATIONS FOR POND OVERFLOW:

Equation: $Q = CLH^{3/2}$

where: C=3.33
L=length (ft)
H=depth - dia/2 (ft)

Location/Basin or Design Point	Location	C	L ft	H ft	Q (100yr) cfs	v capacity ft/sec
Phase 1 South Pond Overflow Weir D3-8 + D1-2	Phase 1	3.33	16.00	1.00	53.28	3.33
			53.28 > 44.10 OK			
Phase 2 Pond Overflow Weir Des Pt E	Phase 2	3.33	44.00	1.25	204.77	3.72
			204.77 > 179.74 OK			

EXCERPTS FROM SUBSURFACE SOIL INVESTIGATION

Architecture
Structural
Geotechnical



Materials Testing
Forensic
Civil/Planning

ROCKY MOUNTAIN GROUP
EMPLOYEE OWNED

SUBSURFACE SOIL INVESTIGATION

**Transwest - Phase 3
13525 CR 8
Fort Lupton, Colorado**

PREPARED FOR:

**Transwest
13525 CR 8
Ft. Lupton, CO 80621**

JOB NO. 175226

March 16, 2020

Respectfully Submitted,
RMG – Rocky Mountain Group



**Lauren Caruso, P.E.
Geotechnical Project Engineer**

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PROJECT DESCRIPTION AND SCOPE

Project Location

The project lies in part of the northwest quarter of Section 17, Township 1 North, Range 66 West. The site is generally located to the south of the Town of Fort Lupton, Colorado. The site is located to the north of Weld County Road 8, between South Rollie Avenue to the west and Weld County Road 29 to the east. The approximate location of the site is shown in the Site Vicinity Map on Figure 1.

Project Description

The project is to consist of the development of a portion of a developed property for commercial use. It is our understanding that this portion of the development will be occupied by a commercial building that will be two stories in height. We also understand that the total building area is 35,200 square feet with 3,600 square feet being the second floor above the office. The site plan indicates the shop will be located to the north of an existing Transwest building and east of a detention pond.

Scope of Work

RMG was retained to assess the soil conditions and develop geotechnical engineering recommendations to support the commercial land development for the proposed project. Our scope of services consisted of a field investigation, laboratory testing, engineering analysis, and report preparation.

This report presents geotechnical engineering recommendations for the design of foundations as well as pavement design for the auto body shop located on the property listed above. The recommendations in this report are also contingent upon completion of an Open Excavation Observation by RMG, prior to construction of the foundations in order to verify subsurface conditions for the specific excavated site.

The following is excluded from the scope of this report including but not limited to geologic, natural and environmental hazards such as landslides, unstable slopes, seismicity, snow avalanches, water flooding, corrosive soils, erosion, radon, wild fire protection, hazardous waste and natural resources.

Existing Site Conditions

At the time of our field exploration the site was a relatively flat open field located to the north of the parking area for the existing Transwest building. A detention pond was identified to the west of the proposed building site. Topography of the site generally sloped gently down from the eastern portion to the western portion of the site. Vegetation consisted of short weeds and ground cover.

FIELD INVESTIGATION AND LABORATORY TESTING

The information included in this report has been compiled from field reconnaissance, exploratory soil borings and soil laboratory testing. Monitoring programs, which typically include instrumentation and/or observations for surface water flows, slope stability, subsidence, and similar conditions, are not known to exist and were not considered applicable for the scope of this report.

Subsurface Investigation

The subsurface conditions on the site were investigated by drilling six exploratory test borings advanced within the proposed footprint. The approximate locations of the test borings are presented in the Boring Location Plan on Figure 2.

The test borings were advanced with a truck-mounted, continuous-flight auger drill rig to depths of 20 feet below the existing ground surface (bgs). Soil samples were obtained from the test borings in general accordance with ASTM D-3550 utilizing a 2½-inch OD modified California sampler. The approximate depth of groundwater was investigated in each of the test borings at the time of drilling. The static groundwater levels were measured following the completion of drilling. The Test Boring Logs are presented in Figures 3 through 5. An Explanation of Test Boring Logs is presented in Figure 6.

Laboratory Testing

The moisture content for the recovered samples was obtained in the laboratory. Grain-size analysis, Atterberg Limits, and swell/consolidation tests were performed on selected samples for purposes of classification and to develop pertinent engineering properties. A Summary of Laboratory Test Results is presented in Figure 7. Soil Classification and Atterberg Test Results are presented in Figure 8. Swell/Consolidation Test Results are presented in Figures 9 and 10.

SUBSURFACE CONDITIONS

Soil and Bedrock Profile

The subsurface materials encountered in the test borings were classified using the Unified Soils Classification System (USCS). The subsurface materials encountered in the test borings generally consisted of an upper soil that consisted of dry, medium dense to dense silty to clayey sand. The silty to clayey sand extends to the bottom of the test bores in B-1, B-3 and B-5. Underlying the upper soils in B-2, sandy clay was encountered at a depth of 19 feet and extends to the final depth of the test boring. Underlying the upper materials in B-4, claystone bedrock was encountered at an approximate depth of 19 feet below grade and extends to the termination depth of the test boring. Underlying the upper sandy materials in B-6, sandy clay was encountered at an approximate depth of 9 feet and extends to approximately 14 feet below grade where claystone bedrock was encountered and extends to the final termination depth of the test borings.

Additional descriptions and the interpreted distribution (approximate depths) of the subsurface materials are presented on the Test Boring Logs. The classifications shown on the logs are based upon the engineer's classification of the samples at the depths indicated. Stratification lines shown on the logs represent the approximate boundaries between material types and the actual transitions may be gradual and vary with location.

Groundwater

Groundwater was not observed in any of the test borings at the time of drilling or when checked five days following the completion of drilling. Fluctuations in groundwater and subsurface moisture

conditions may occur due to variations in rainfall and other factors not readily apparent at this time. Development of the property and adjacent properties may also affect groundwater levels.

CONCLUSIONS

The following discussion is based on the subsurface conditions encountered in the test borings and on the project characteristics previously described. If conditions are different from those described in this report or the project characteristics change, RMG should be retained to review our recommendations and adjust them, if necessary. The results of this investigation indicate that the site is suitable for the proposed project provided the recommendations presented herein are implemented.

As previously discussed the site is underlain primarily by an upper material comprised of dry, medium dense to dense, silty to clayey sand. Underlying the upper sandy soils, stiff sandy clay was encountered in one test bore at a depth of approximately 9 feet below grade and claystone bedrock as encountered at 14 to 19 feet below grade. The silty to clayey sand sample tested consolidated up to 7.7%. The sandy clay sample tested exhibited swells up to 1.9%. The claystone bedrock sample tested exhibited swells of up to 6.3%. All samples tested were wetted against surcharge pressures of 1,000 psf.

Geotechnical recommendations based on the field investigation and laboratory testing, are presented below. It must be understood that these recommendations should be verified after the excavation on each individual lot is completed.

SITE DEVELOPMENT AND EARTHWORK

Site Preparation

Prior to construction the ground surface in proposed structure and improvement areas should be stripped of existing vegetation, debris, topsoil, undocumented fill, soft, loose, or disturbed native soils, and other deleterious material. Materials generated during clearing operations should be removed from the project site for disposal. Soft, loose, or yielding subgrade should be removed to a depth that exposes firm subgrade and replaced with structural fill. In areas to receive structural fill, the exposed subgrade should be scarified, moisture conditioned, and compacted per the recommendations set forth in this report.

Excavations

The on-site surface and near surface soils may generally be excavated with heavy-duty earthmoving or excavation equipment in good operating condition. During wet weather, earthen berms, swales, or other methods should be used where necessary to route water away from excavations. Water that accumulates in excavations should be promptly pumped out or otherwise removed and the area allowed to dry before resuming construction.

Geotechnical Considerations

The on-site upper sand and clay materials encountered are not suitable for direct bearing of shallow foundations in their current state. Dry and collapsible soils were encountered at and beneath anticipated foundation depths. Where the dry collapsible soils are encountered we recommend reconditioning the soils beneath the foundation components prior to constructing the foundation by

overexcavating, moisture conditioning and recompacting the on-site sand soils that results in a minimum of four feet of reconditioned on-site sand soils beneath the lowest part of the foundation components. Please reference the Structural Fill section below for compaction recommendations. The use of track-mounted excavation equipment or other low-ground-pressure equipment is recommended to reduce the likelihood of loss of stability during excavation. Footings should be placed on similar subsoils to reduce the potential of differential movement across dissimilar soils.

Foundation Wall Backfill

Backfill should be placed in loose lifts not exceeding 8 to 12 inches with material no greater than 4 inches in diameter, moisture conditioned to facilitate compaction (usually within 2 percent of the optimum moisture content) and compacted to 90 percent of the maximum dry density as determined by the Standard Proctor test, ASTM D-698 on exterior sides of walls in landscaped areas. In areas where backfill supports pavement and concrete flatwork, the materials should be moisture conditioned to ± 2 percent optimum moisture content compacted to 95 percent of the maximum dry density as determined by the Standard Proctor test, ASTM D-698.

Fill placed on slopes should be benched into the slope. Maximum bench heights should not exceed 4 feet, and bench widths should be wide enough to accommodate compaction equipment.

The backfill should not be placed on frozen subgrade or allowed to freeze during moisture conditioning and placement. Backfill should be compacted by mechanical means, and foundation walls should be braced during backfilling and compaction.

Structural Fill

Areas to receive structural fill should have topsoil, organic material, or debris removed. The upper 9 inches of the exposed surface soils at the bottom of the excavation should be scarified and moisture conditioned to facilitate compaction (usually within 2 percent of the optimum moisture content) and compacted to a minimum of 95 percent of the maximum dry density as determined by the Standard Proctor test (ASTM D-698) prior to placing structural fill.

Structural fill placed on slopes should be benched into the slope. Maximum bench heights should not exceed 4 feet, and bench widths should be wide enough to accommodate compaction equipment.

Structural fill shall consist of granular, non-expansive material, and it should be placed in loose lifts not exceeding 8 to 12 inches, moisture conditioned to facilitate compaction (usually within 2 percent of the optimum moisture content) and compacted to a minimum of 95 percent of the maximum dry density as determined by the Standard Proctor test, ASTM D-698. The materials should be compacted by mechanical means.

Materials used for structural fill should be approved by RMG prior to use. Structural fill should not be placed on frozen subgrade or allowed to freeze during moisture conditioning and placement.

To verify the condition of the compacted soils, density tests should be performed during placement. The first density tests should be conducted when 24 inches of fill have been placed.

FOUNDATION OPTIONS

Anticipated Foundation Systems

A spread footing foundation system may be utilized at this site, provided a minimum of four feet of reconditioned soils as stated above are beneath the footings, pads and slabs. A maximum allowable bearing pressure of 2,000 psf with no minimum dead load requirement may be used for design purposes.

Foundation components must be below all organic material and should extend 30 inches or more below the lowest exterior finished grade for frost protection. The foundation design should be prepared by a qualified Colorado Registered Professional Engineer using the recommendations presented in this report. This foundation system should be designed to span a minimum of 10 feet under the design loads.

Open Excavation Observations

During construction, foundation excavations should be observed by RMG prior to placing structural fill, forms or concrete to verify the foundation bearing conditions for each structure.

INTERIOR FLOOR SYSTEMS

Interior Floor Slabs

Vertical slab movement of one to two inches is considered possible for slabs bearing on all soil types. In some cases, vertical movement may exceed this range. If movement and associated damage to floors and finishes cannot be tolerated, a structural floor system should be used.

Floor slabs should be separated from structural components to allow for vertical movement. Control and construction joints should be placed in accordance with the latest guidelines and standards published by the American Concrete Institute (ACI) and applicable local Building Code requirements.

Interior Partitions

Interior non-bearing partitions and attached furnishings (e.g., cabinets, shower stalls, etc.) on concrete slabs should be constructed with a void so that they do not transmit floor slab movement to the roof or overlying floor. A void of at least 1-1/2 inches is recommended beneath non-bearing partitions. The void may require reconstruction over the life of the structure to re-establish the void due to vertical slab movement.

LATERAL EARTH PRESSURES

Foundation walls should be designed to resist lateral earth pressures. For the on-site upper sand materials encountered at the site, we recommend an equivalent fluid pressure of 40 pcf. The lateral pressure applies to level, drained backfill conditions. These values assume the backfill will not become saturated during the life of the structure, therefore positive surface drainage must be maintained. It is

also assumed that compaction within approximately 5 feet of the walls will be accomplished with relatively light compaction equipment. Equivalent Fluid Pressures for sloping/undrained conditions should be determined on an individual basis.

SURFACE GRADING AND DRAINAGE

Grading and Irrigation

The ground surface should be sloped from the building with a minimum gradient of 5 percent for the first 10 feet. This is equivalent to 6 inches of fall across this 10-foot zone. If a 10-foot zone is not possible on the upslope side of the structure, then a well-defined swale should be created a minimum 5 feet from the foundation and sloped parallel with the wall with a minimum slope of 2 percent to intercept the surface water and transport it around and away from the structure. Roof drains should extend across backfill zones and landscaped areas to a region that is graded to direct flow away from the structure. Property owners should maintain the surface grading and drainage recommended in this report to help prevent water from being directed toward and/or ponding near the foundations.

Landscaping should be selected to reduce irrigation requirements. Plants used close to foundation walls should be limited to those with low moisture requirements and irrigated grass should not be located within 5 feet of the foundation. To help control weed growth, geotextiles should be used below landscaped areas adjacent to foundations. Impervious plastic membranes are not recommended.

Irrigation devices should not be placed within 5 feet of the foundation. Irrigation should be limited to the amount sufficient to maintain vegetation. Application of more water will increase the likelihood of slab and foundation movements.

The recommendations listed in this report are intended to address normal surface drainage conditions, assuming the presence of groundcover (established vegetation, paved surfaces, and/or structures) throughout the regions upslope from this structure. However, groundcover may not be present due to a variety of factors (ongoing construction/development, wildfires, etc.). During periods when groundcover is not present in the "upslope" regions, higher than normal surface drainage conditions may occur, resulting in perched water tables, excess runoff, flash floods, etc. In these cases, the surface drainage recommendations presented herein (even if properly maintained) may not mitigate all groundwater problems or moisture intrusion into the structure. We recommend that the site plan be prepared with consideration of increased runoff during periods when groundcover is not present on the upslope areas.

Perimeter Drain

A subsurface perimeter drain is recommended around portions of the structure if the structure will have habitable or storage space located below the finished ground surface.

The perimeter drain can be installed as an interior (if a minimum of six inches of free draining aggregate is placed beneath the slab) or exterior perimeter drain system. The perforated drainage pipe should be installed so the top of the pipe is not above the top of the footing and should be surrounded by material to reduce the infiltration of silt into the drainage pipe. The pipe should be installed in one of the following manners:

1) The pipe may be installed as level as possible as long as the pipe is placed in a minimum of six inches of gravel or crushed stone and exits into a sump pit with mechanical means to remove the water.

Or

2) The pipe may be installed as a gravity system with a minimum 1/8 inch fall per 1 foot length surrounded by a minimum six inches of gravel or crushed stone that either daylight to allow free flow drainage or exits into a sump pit with mechanical means to remove the water.

A subsurface perimeter drain is designed to intercept some types of subsurface moisture and not others. Therefore, the drain could operate properly and not mitigate all moisture problems relating to foundation performance or moisture intrusion into the basement area.

CONCRETE

Sulfate testing was performed on selected samples based on ASTM C1580. Test results showed 0% by weight, indicating the soils present Class 0 (Nil to Low) sulfate exposure. Based on these results Type I/II cement or equivalent mixture according to ACI 201.2R-10 is suggested for concrete in contact with the subsurface materials. Cement type shall be designed and approved by a licensed Colorado Professional Engineer and Foundation Designer. Calcium chloride should not be used for the onsite soils. The concrete should not be placed on frozen ground. If placed during periods of cold temperatures, the concrete should be kept from freezing. This may require covering the concrete with insulated blankets and heating. Concrete work should be completed in accordance with the latest applicable guidelines and standards published by ACI.

CLOSING

This report has been prepared for the exclusive purpose of providing geotechnical engineering information and recommendations for development described in this report. RMG should be retained to review the final construction documents prior to construction to verify our findings, conclusions and recommendations have been appropriately implemented.

This report has been prepared for the exclusive use by **Transwest** for application as an aid in the design and construction of the proposed development in accordance with generally accepted geotechnical engineering practices. The analyses and recommendations in this report are based in part upon data obtained from test borings and site observations. The nature and extent of variations may not become evident until construction. If variations then become evident, RMG should be retained to review the recommendations presented in this report considering the varied condition, and either verify or modify them in writing.

Our professional services were performed using that degree of care and skill ordinarily exercised, under similar circumstances, by geotechnical engineers practicing in this or similar localities. RMG does not warrant the work of regulatory agencies or other third parties supplying information which may have been used during the preparation of this report. No warranty, express or implied is made by the

preparation of this report. Third parties reviewing this report should draw their own conclusions regarding site conditions and specific construction techniques to be used on this project.

The scope of services for this project does not include, either specifically or by implication, environmental assessment of the site or identification of contaminated or hazardous materials or conditions. Development of recommendations for the mitigation of environmentally related conditions, including but not limited to biological or toxicological issues, are beyond the scope of this report. If the Client desires investigation into the potential for such contamination or conditions, other studies should be undertaken.

If we can be of further assistance in discussing the contents of this report or analysis of the proposed development, from a geotechnical engineering point-of-view, please feel free to contact us.



LSC TRANSPORTATION CONSULTANTS, INC.

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May 3, 2017

Mr. James A. Childs, AIA, NCARB
Design and Development Consultants
T-Bone Construction
1310 Fort Street
Colorado Springs, CO 80915

Re: Transwest Summit Body Works
Traffic Impact Analysis
Ft. Lupton, CO
LSC #160930

Dear Mr. Childs:

LSC Transportation Consultants, Inc. has prepared this updated traffic impact analysis for the proposed Transwest Summit Body Works facility. As shown in Figure 1, the site is located east of Weld County Road (WCR) 27 and north of Weld County Road 8 in the City of Fort Lupton, Colorado. A single site access point is proposed to Weld County Road 8.

INTRODUCTION

We acknowledge that the City of Fort Lupton's review of this 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 section 11-6-5(B)3 of the City Code of the City of Fort Lupton.

REPORT CONTENTS

This report contains a description of the existing roadway and traffic conditions adjacent to the site, estimates of future background traffic volumes, the site's proposed land use, proposed locations for site access points, the site's projected trip generation, an assignment of the site-generated traffic volumes to the area roadways, an assessment of the site's traffic impacts, and recommendations for access and adjacent street improvements.

LAND USE AND ACCESS

The 39.2-acre site is located north of WCR 8 about one-half mile east of WCR 27. The site is currently zoned R-O (residential office). There are two existing unoccupied residences located on the site which are planned to be razed with this development. The site is planned to be rezoned to industrial.

Figure 2 shows the proposed site plan. The southeast area of the site is planned to contain a 78,700 square-foot building. About 5,000 square feet will be used as office and administrative space. The remaining space will be used for a body shop for vehicles and trailers including light, medium, and large trucks and semi-trailers. This building will house about 90 employees who will work one shift. Most will work from 7:00 am to 6:00 pm with a small portion of office/administrative employees working a more traditional 8:00 am to 5:00 pm schedule.

The southwest area of the site is planned to contain a 52,200 square-foot building which will be used as a body shop installing van boxes on the body of trucks. This building will house about 45 employees who will work one shift.

There are currently no plans to develop the 10.329-acre area located on the north end of the site and it may remain undeveloped even in the long term future.

Full movement access is planned to WCR 8 about 3,185 feet east of Weld County Road 27. This access will align with a planned access for the parcel south of WCR 8.

ROADWAY AND TRAFFIC CONDITIONS

Area Roadways

Figure 1 shows the roadways in the site's vicinity. The roadways adjacent to the site are identified below followed by a brief description.

- **Weld County Road 27** is a two-lane arterial road which extends north and south through Weld County. The posted speed limit in the vicinity of the site 40 miles per hour (mph). The intersection of WCR 27/WCR 8 is currently signal controlled.
- **Weld County Road 8** extends east and west across Weld County. Adjacent to the site WCR 8 has one through lane in each direction and is classified as a collector. The posted speed limit for eastbound traffic is 35 mph from WCR 27 to the east boundary of the site where the speed limit increases to 55 mph. The posted speed limit for westbound traffic is 55 mph to the west boundary of the site where it decreases to 35 mph.

BACKGROUND TRAFFIC

Figure 4 shows the estimated 2036 background traffic volumes. These volumes are based on an annual growth rate of 5.1 percent as shown in the *Weld County 2035 Transportation Plan*. The 2036 background traffic estimates also include vehicle-trips estimated to be generated by the potential light industrial use on the parcel located just south of the site.

TRIP GENERATION

The vehicle-trips to be generated by the site were estimated using trip generation rates for Light Industrial from *Trip Generation*, 9th Edition, 2012 by the Institute of Transportation Engineers (ITE). Table 1 shows the trip generation estimates. Table 1 also shows the trip generation estimate for the northern 10.3 acres which is not included as part of the currently proposed development.

Following the development of two proposed buildings to be located on the southern portion of the site, the site is projected to generate about 913 new vehicle-trips on the average weekday, with about half entering and half exiting the site during a 24-hour period. During the morning peak-hour, which typically occurs for one hour between 6:30 and 8:30 a.m., about 106 vehicles would enter and 15 vehicles would exit the site. During the afternoon peak-hour, which typically occurs for one hour between 4:15 and 6:15 p.m., about 15 vehicles would enter and 112 would exit the site.

If the north area is developed for industrial uses, the entire site is projected to generate about 1,481 new vehicle-trips on the average weekday, with about half entering and half exiting the site during a 24-hour period. During the morning peak-hour about 174 vehicles would enter and 29 vehicles would exit the site. During the afternoon peak-hour about 33 vehicles would enter and 112 would exit the site.

TRIP DISTRIBUTION AND ASSIGNMENT

Figure 5 shows the estimated directional distribution of the site-generated traffic volumes on the area roadways, which is an important factor in determining the site's traffic impacts. The directional distribution estimates were based on information provided by Transwest.

SITE-GENERATED TRAFFIC

Figure 6 shows the estimated short-term site-generated traffic volumes which assume development of the two proposed buildings to be located on the southern portion of the site only. These volumes were calculated by applying the directional distribution percentages (from Figure 5) to the trip generation estimates (from Table 1).

Figure 7 shows the estimated long-term site-generated traffic volumes which include development of the north end of the site. There are currently no plans for development of this area and it may remain undeveloped even in the long-term future; however, this analysis assumes this area is developed with industrial uses based on the proposed zone change.

EXISTING PLUS SITE-GENERATED TRAFFIC

Figure 8 shows the projected short-term total traffic volumes, which are the sum of the existing traffic volumes (from Figure 3) and the short-term site-generated traffic volumes (from Figure 6). These volumes represent the development's short-term traffic impacts.

2036 TOTAL TRAFFIC

Figure 9 shows the projected 2036 total traffic volumes. These volumes are the sum of 2036 background traffic (from Figure 4) and the long-term site-generated traffic volumes (from Figure 7).

PROJECTED LEVELS OF SERVICE

Level of service (LOS) is a quantitative measure of the level of congestion or delay at an intersection. Level of service is indicated on a scale from "A" to "F". LOS A represents control delay of less than 10 seconds for unsignalized and signalized intersections. LOS F represents control delay of more than 50 seconds for unsignalized intersections and more than 80 seconds for signalized intersections. Table 2 shows the level of service delay ranges.

Table 2 Intersection Levels of Service Delay Ranges		
Level of Service	Signalized Intersections	Unsignalized Intersections
	Control Delay (seconds per vehicle)	
A	≤10 sec	≤10 sec
B	10-20 sec	10-15 sec
C	20-35 sec	15-25 sec
D	35-55 sec	25-35 sec
E	55-80 sec	35-50 sec
F	≥80 sec	≥50 sec

The site access point to WCR 8 was analyzed to determine the projected levels of service for background and total traffic volumes. The site access point was analyzed based on the unsignalized method of analysis procedures found in *the Highway Capacity Manual, 2010 Edition* by the Transportation Research Board. Table 3 show the level of service analysis results. The level of service reports are attached.

The site access point to WCR 8 is projected to operate at a satisfactory level of service (LOS C or better) during the peak-hours as a stop-sign controlled intersection based on existing plus site-generated and 2036 total traffic volumes.

CONCLUSIONS AND RECOMMENDATIONS

Trip Generation

1. Following the development of the two proposed buildings to be located on the southern portion of the site, the site is projected to generate about 913 new vehicle-trips on the average weekday, with about half entering and half exiting the site during a 24-hour period. During the morning peak-hour about

106 vehicles would enter and 15 vehicles would exit the site. During the afternoon peak-hour about 15 vehicles would enter and 112 vehicles would exit the site.

2. If the northern 10.3 acres is developed for industrial uses, then the entire site is projected to generate about 1,481 new vehicle-trips on the average weekday, with about half entering and half exiting the site during a 24-hour period. During the morning peak-hour about 174 vehicles would enter and 29 vehicles would exit the site. During the afternoon peak-hour about 33 vehicles would enter and 174 vehicles would exit the site.

Projected Levels of Service

3. The proposed site access point to Weld County Road 8 is projected to operate at satisfactory levels of service as a stop-sign controlled intersection.

Auxiliary Turn Lanes

4. Based on the criteria contained in the *Weld County Engineering and Construction Criteria*, an east-bound left-turn lane would be required on the WCR 8 approach at the site access point. It is our understanding that the speed limit on WCR 8 is to be reduced to 35 mph adjacent to the site. Based on a posted speed limit of 35 mph, a 310-foot left-turn lane should be provided approaching the site access. A redirect taper of 20:1 is appropriate for 35 mph.
5. Based on the criteria contained in the *Weld County Engineering and Construction Criteria*, a west-bound right-turn deceleration lane would **not** be required on WCR 8 approaching the proposed site access point.
6. Based on the criteria contained in the *Weld County Engineering and Construction Criteria*, a west-bound right-turn acceleration would be required on WCR 8 at the site access point. Based on a posted speed limit of 35 mph, this lane should be 270 feet long plus a 120-foot taper.

* * * * *

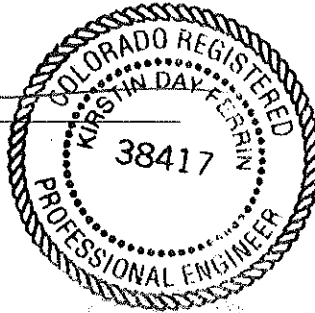
We trust this traffic impact analysis will assist you in planning the Transwest Summit Body Works facility. Please contact me if you have any questions or need further assistance.

Sincerely,

LSC TRANSPORTATION CONSULTANTS, INC.

By: _____

Kirstin D. Ferrin, PE
Senior Transportation Engineer



KDF/CSM/we

Enclosures: Tables 1 - 3
Figures 1 - 8
Traffic Count Reports
Level of Service Reports

Y:\LSC\Projects\2016\160930-TranswestSummitBodyWorks\May-2017\TranswestSummitBodyWorks050317.wpd

Table 1
Trip Generation Estimate
Transwest Summit Body Works

Phase	Land Use	Land Use Description	Trip Generation Units	Trip Generation Rates ⁽¹⁾						Total Trips Generated					
				Average Weekday Traffic	Morning Peak Hour	Afternoon Peak Hour	In	Out	In	Out	Average Weekday Traffic	Morning Peak Hour	Afternoon Peak Hour	In	Out
Trip Generation Estimate for the Currently Proposed Development															
1	110	General Light Industrial	78.7 KSF ⁽²⁾	6.97	0.81	0.11	0.12	0.85			549	64	9	9	67
2	110	General Light Industrial	52.2 KSF	6.97	0.81	0.11	0.12	0.85			364	42	6	6	45
											913	106	15	15	112
Trip Generation Estimate for Potential Future Land Use															
3	110	General Light Industrial	10.97 acres	51.80	6.23	1.28	1.60	5.66			568	68	14	18	62
											1,481	174	29	33	174

Notes:

(1) Source: *Trip Generation*, 9th Edition, 2012, by the Institute of Transportation Engineers (ITE)

(2) KSF = 1,000 square feet of floor area

Source: LSC Transportation Consultants, Inc.

Table 3
Intersection Level of Service Analysis
Transwest Summit Body Works

Intersection Location	Traffic Control	2016 Existing Plus Site- Generated Traffic		Year 2036 Background Traffic		Year 2036 Background Plus Site-Generated Traffic	
		AM	PM	AM	PM	AM	PM
Weld County Road 8/Site Access							
Northbound Approach		---	---	B	B	C	C
Eastbound Left-Turn		A	A	---	---	A	A
Westbound Left-Turn		---	---	A	A	A	A
Southbound Approach		A	A	---	---	A	B
Critical Movement Delay (sec/vehicle)		9.0	9.5	10.2	12.8	16.8	22.7

Notes:

(1) Based on 2010 Highway Capacity Manual (HCM) methodology and Level of Service (LOS) definitions.

Source: LSC Transportation Consultants, Inc.



Approximate Scale
Scale: 1"=1,200'



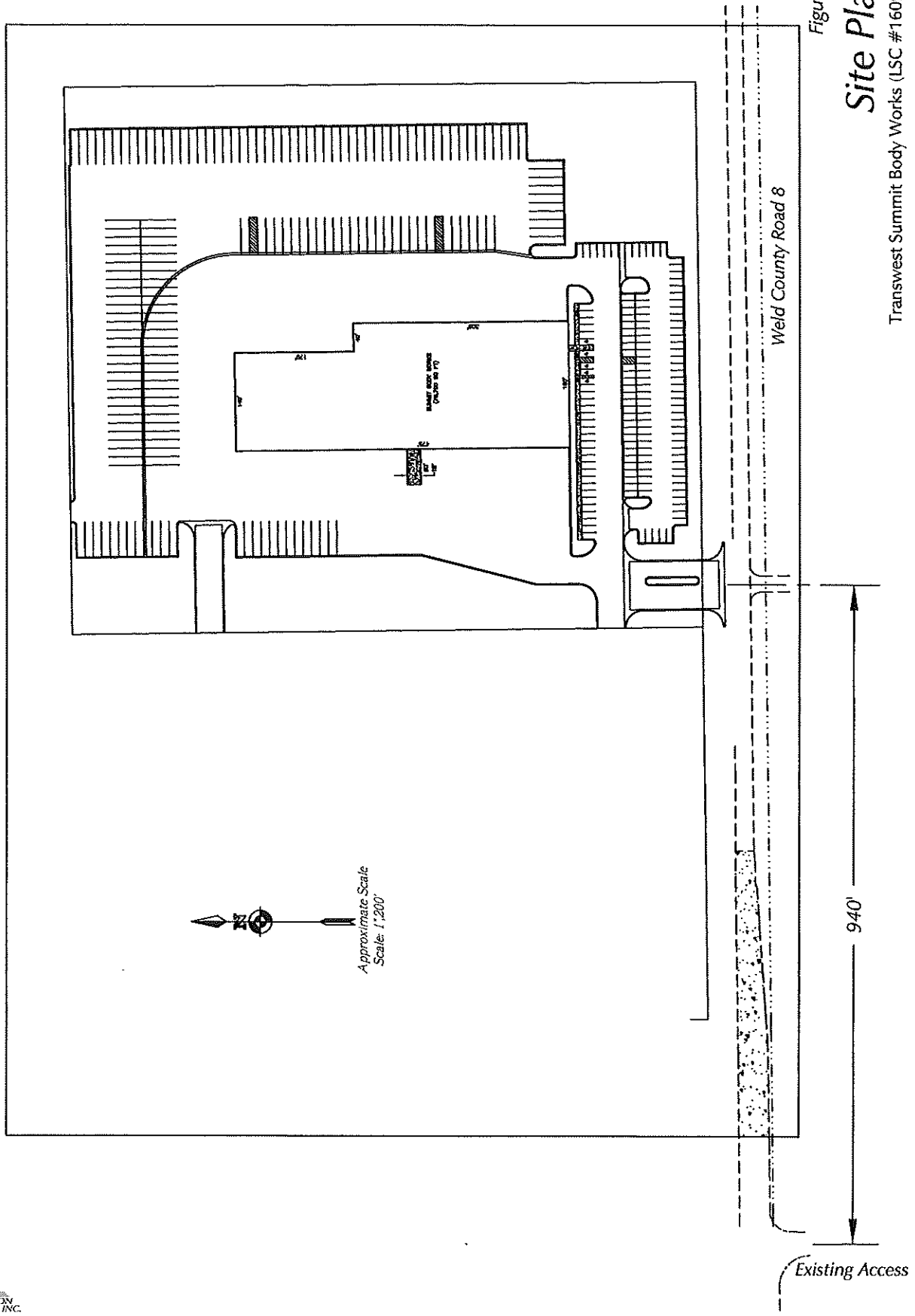
Figure 1
*Vicinity
Map*

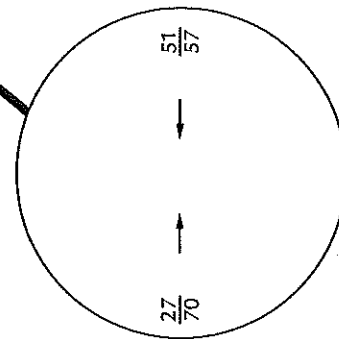
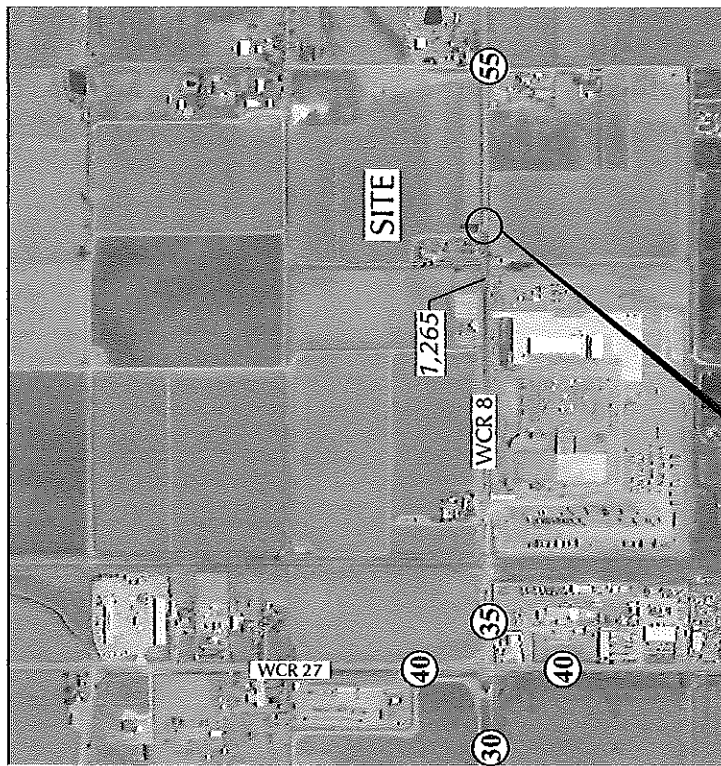
Transwest Summit Body Works (LSC #160930)

Figure 2

Site Plan

Transwest Summit Body Works (LSC #160930)





LEGEND:

(30) = Posted Speed Limit

$\frac{26}{35}$ = $\frac{\text{AM Peak Hour Traffic}}{\text{PM Peak Hour Traffic}}$

2,500 = Average Daily Traffic

Based on counts by Counter Measures Aug 2016

Figure 3

Existing Traffic, Lane Geometry and Traffic Control

Transwest Summit Body Works (LSC #160930)

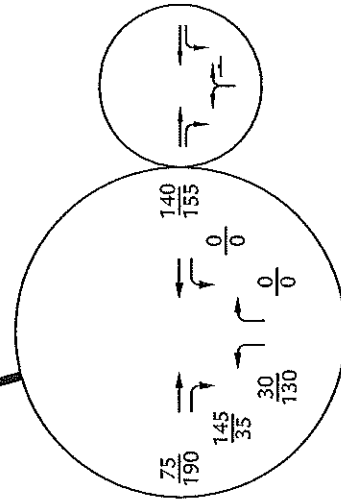
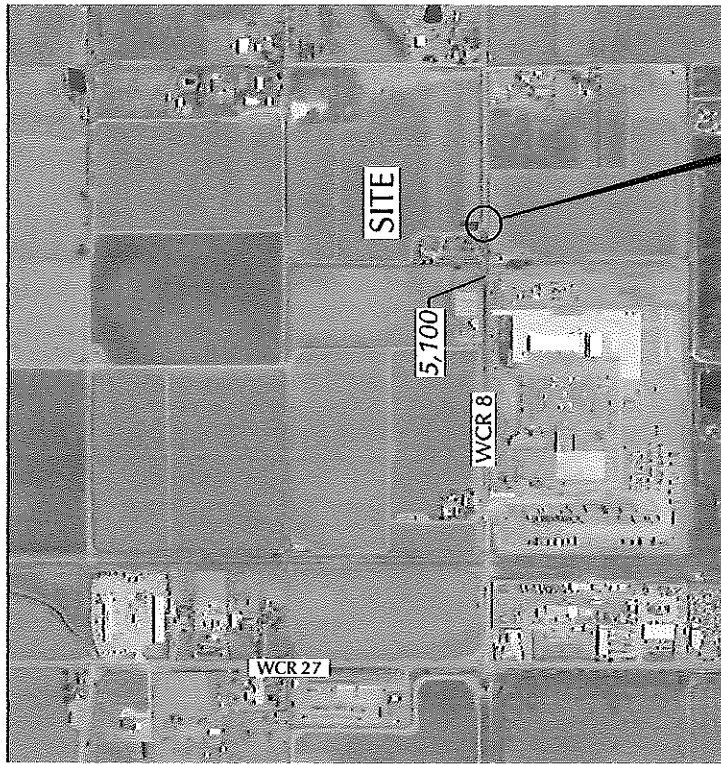


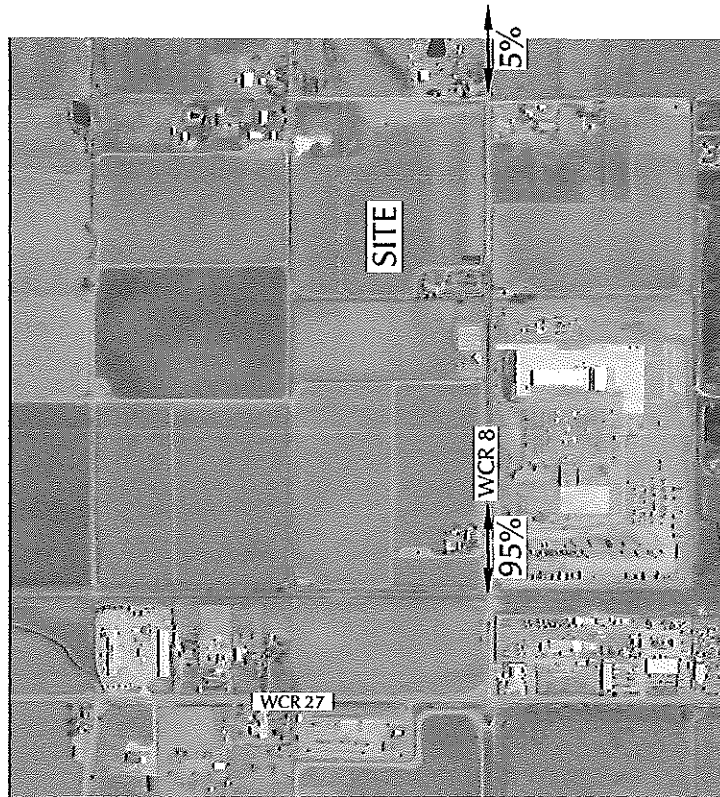
Figure 4
**Year 2036 Background Traffic,
Lane Geometry and Traffic Control**
Transwest Summit Body Works (LSC #160930)

LEGEND:

- ⊥ = Stop Sign
- $\frac{26}{35}$ = $\frac{\text{AM Peak Hour Traffic}}{\text{PM Peak Hour Traffic}}$
- 2,500 = Average Daily Traffic

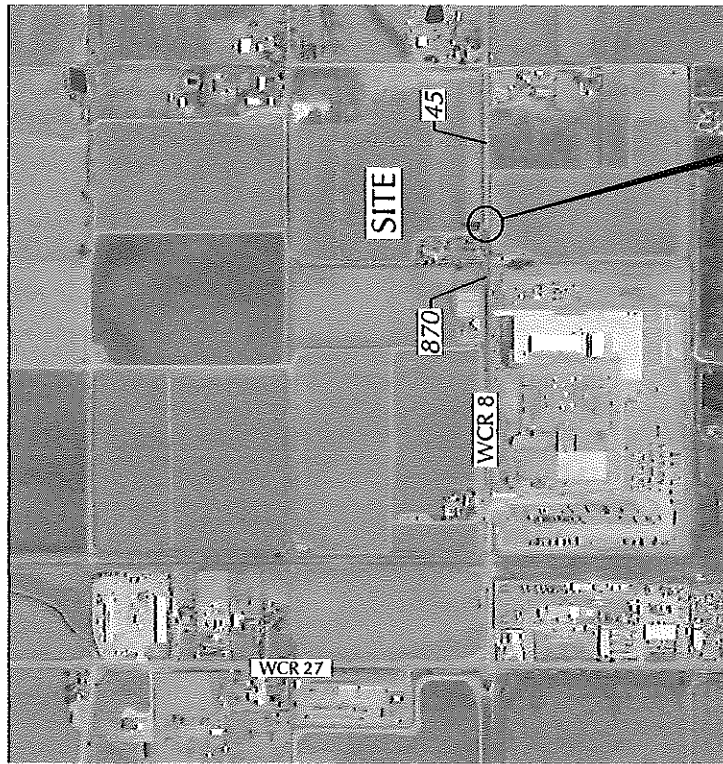


Approximate Scale
Scale: 1"=1,200'



LEGEND:  = Percent Directional Distribution

Figure 5
*Directional Distribution
of Site-Generated Traffic*
Transwest Summit Body Works (LSC #160930)



Approximate Scale
Scale: 1" = 1,200'

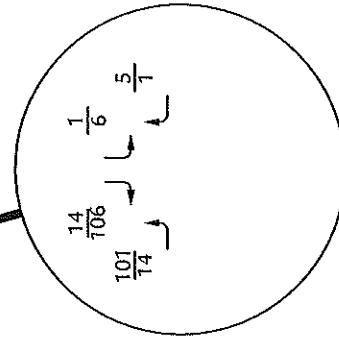


Figure 6

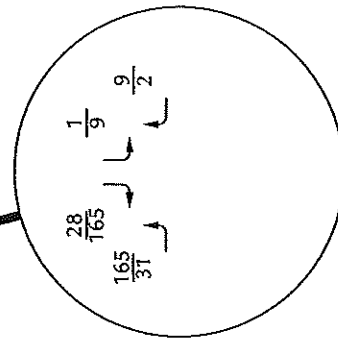
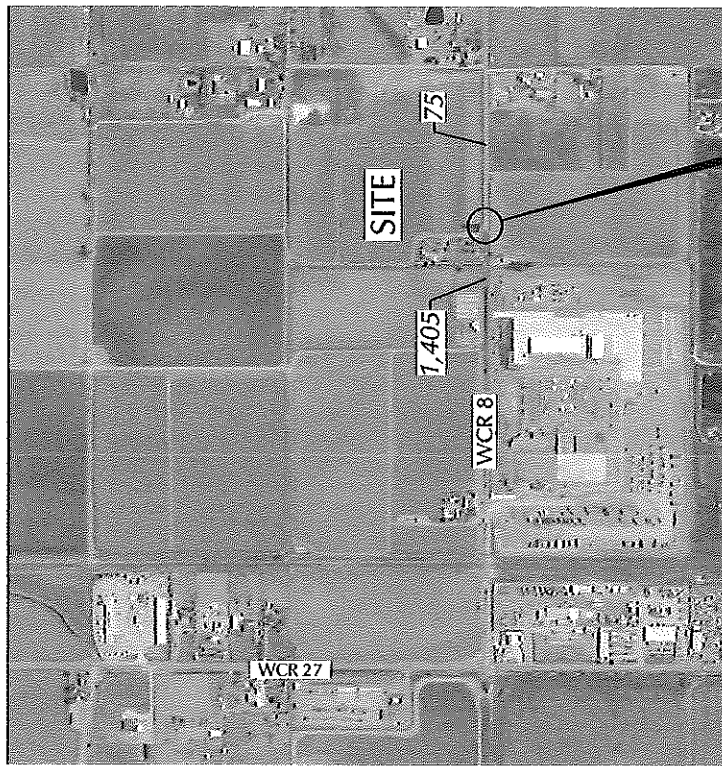
Assignment of Phases 1 & 2 Site-Generated Traffic

Transwest Summit Body Works (LSC #160930)

LEGEND:

$\frac{26}{35}$ = $\frac{\text{AM Peak Hour Traffic}}{\text{PM Peak Hour Traffic}}$

2,500 = Average Daily Traffic



Approximate Scale
Scale: 1"=1,200'

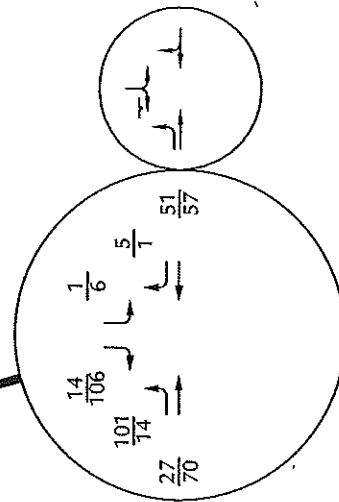
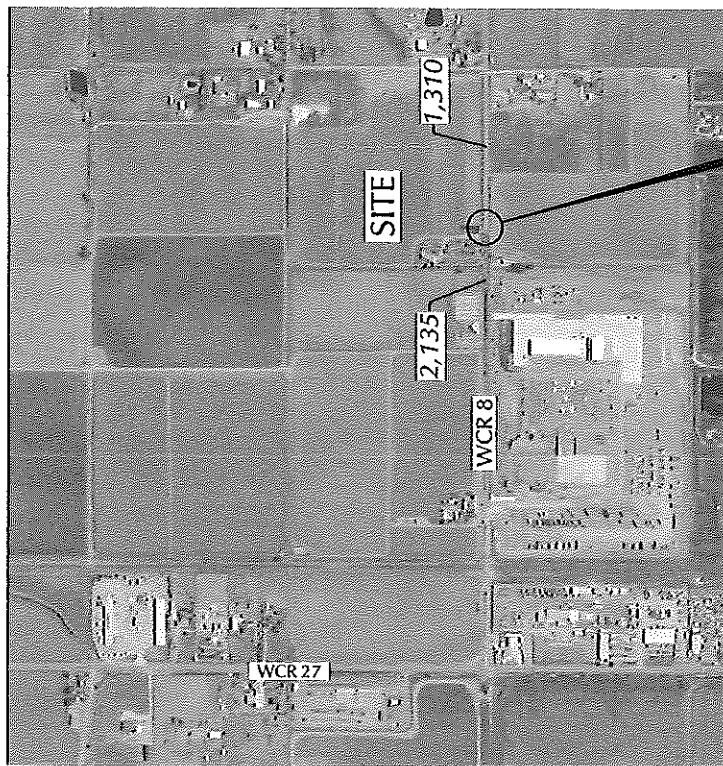
Figure 7

Assignment of Buildout Site-Generated Traffic

Transwest Summit Body Works (LSC #160930)

LEGEND:

$\frac{26}{35}$ = AM Peak Hour Traffic
PM Peak Hour Traffic
2,500 = Average Daily Traffic



Approximate Scale
Scale: 1"=1,200'

LEGEND:

┆ = Stop Sign

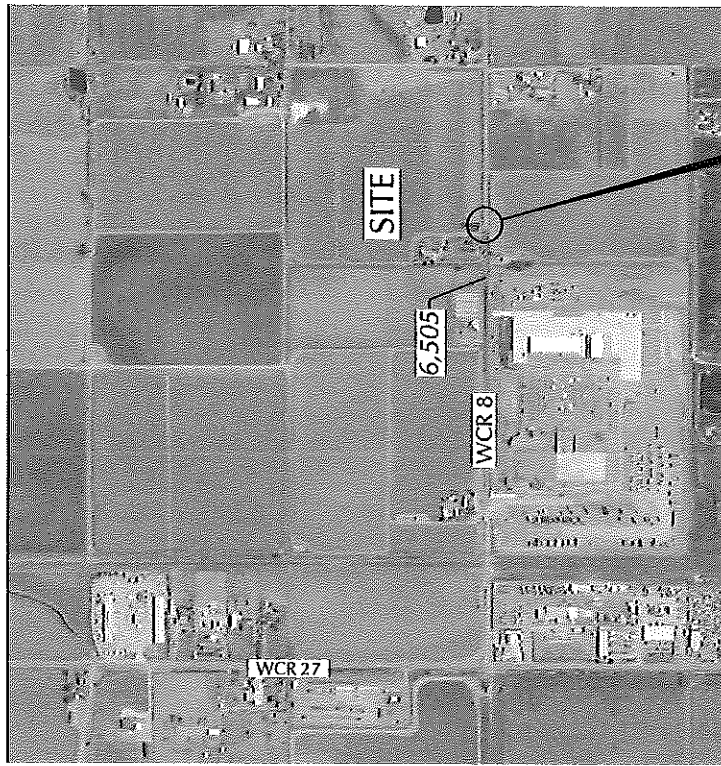
$\frac{26}{35}$ = AM Peak Hour Traffic
PM Peak Hour Traffic

2,500 = Average Daily Traffic

Figure 8

Existing plus Phases 1 & 2 Site-Generated Traffic, Lane Geometry and Traffic Control

Transwest Summit Body Works (LSC #160930)



Approximate Scale
Scale: 1"=1,200'

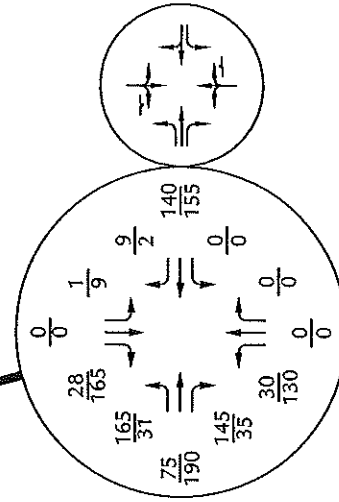


Figure 9

Year 2036 Total Traffic, Lane Geometry and Traffic Control

Transwest Summit Body Works (LSC #160930)

LEGEND:

- ┆ = Stop Sign
- $\frac{26}{35}$ = $\frac{\text{AM Peak Hour Traffic}}{\text{PM Peak Hour Traffic}}$
- 2,500 = Average Daily Traffic

COUNTER MEASURES INC.

Location: CR-8 E/O CR-27
 City: FORT LUPTON
 County: WELD
 Direction: EASTBOUND-WESTBOUND

1889 YORK STREET
 DENVER, COLORADO 80206
 303-333-7409

Site Code: 080918
 Station ID: 080918

Start Time	09-Aug-1 Tue	EB	WB	Total
12:00 AM		2	0	2
01:00		1	2	3
02:00		4	2	6
03:00		5	7	12
04:00		4	9	13
05:00		4	35	39
06:00		27	51	78
07:00		22	49	71
08:00		24	29	53
09:00		20	22	42
10:00		32	42	74
11:00		38	42	80
12:00 PM		47	34	81
01:00		44	30	74
02:00		38	33	71
03:00		48	41	89
04:00		70	57	127
05:00		68	46	114
06:00		50	39	89
07:00		32	24	56
08:00		27	9	36
09:00		18	10	28
10:00		10	5	15
11:00		5	6	10
Total		640	623	1263
Percent		50.7%	49.3%	
AM Peak	-	11:00	06:00	11:00
Vol.	-	38	51	80
PM Peak	-	16:00	16:00	16:00
Vol.	-	70	57	127

Intersection	
Int Delay, s/veh	4.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑	↑		↰	
Traffic Vol, veh/h	101	27	51	5	1	14
Future Vol, veh/h	101	27	51	5	1	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	310	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	20	5	5	20	20	20
Mvmt Flow	119	32	60	6	1	16

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	66	0	332
Stage 1	-	-	63
Stage 2	-	-	269
Critical Hdwy	4.3	-	6.6
Critical Hdwy Stg 1	-	-	5.6
Critical Hdwy Stg 2	-	-	5.6
Follow-up Hdwy	2.38	-	3.68
Pot Cap-1 Maneuver	1429	-	628
Stage 1	-	-	916
Stage 2	-	-	736
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1429	-	576
Mov Cap-2 Maneuver	-	-	576
Stage 1	-	-	916
Stage 2	-	-	675

Approach	EB	WB	SB
HCM Control Delay, s	6.1	0	9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1429	-	-	-	913
HCM Lane V/C Ratio	0.083	-	-	-	0.019
HCM Control Delay (s)	7.7	-	-	-	9
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0.3	-	-	-	0.1

Intersection							
Int Delay, s/veh	4.6						
Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations	↰	↑	↱		↰		
Traffic Vol, veh/h	14	70	57	1	6	106	
Future Vol, veh/h	14	70	57	1	6	106	
Conflicting Peds, #/hr	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Stop	Stop	
RT Channelized	-	None	-	None	-	None	
Storage Length	310	-	-	-	0	-	
Veh in Median Storage, #	-	0	0	-	0	-	
Grade, %	-	0	0	-	0	-	
Peak Hour Factor	85	85	85	85	85	85	
Heavy Vehicles, %	20	5	5	20	20	20	
Mvmt Flow	16	82	67	1	7	125	

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	68	0	-	0	183	68
Stage 1	-	-	-	-	68	-
Stage 2	-	-	-	-	115	-
Critical Hdwy	4.3	-	-	-	6.6	6.4
Critical Hdwy Stg 1	-	-	-	-	5.6	-
Critical Hdwy Stg 2	-	-	-	-	5.6	-
Follow-up Hdwy	2.38	-	-	-	3.68	3.48
Pot Cap-1 Maneuver	1426	-	-	-	767	947
Stage 1	-	-	-	-	911	-
Stage 2	-	-	-	-	867	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1426	-	-	-	758	947
Mov Cap-2 Maneuver	-	-	-	-	758	-
Stage 1	-	-	-	-	911	-
Stage 2	-	-	-	-	857	-

Approach	EB	WB	SB
HCM Control Delay, s	1.3	0	9.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1426	-	-	-	935
HCM Lane V/C Ratio	0.012	-	-	-	0.141
HCM Control Delay (s)	7.6	-	-	-	9.5
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.5

Intersection						
Int Delay, s/veh	0.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Vol, veh/h	75	145	0	140	30	0
Future Vol, veh/h	75	145	0	140	30	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	310	310	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	5	20	20	5	20	20
Mvmt Flow	80	154	0	149	32	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	80	0	229	80
Stage 1	-	-	-	-	80	-
Stage 2	-	-	-	-	149	-
Critical Hdwy	-	-	4.3	-	6.6	6.4
Critical Hdwy Stg 1	-	-	-	-	5.6	-
Critical Hdwy Stg 2	-	-	-	-	5.6	-
Follow-up Hdwy	-	-	2.38	-	3.68	3.48
Pot Cap-1 Maneuver	-	-	1411	-	721	932
Stage 1	-	-	-	-	900	-
Stage 2	-	-	-	-	836	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1411	-	721	932
Mov Cap-2 Maneuver	-	-	-	-	721	-
Stage 1	-	-	-	-	900	-
Stage 2	-	-	-	-	836	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	721	-	-	1411	-
HCM Lane V/C Ratio	0.044	-	-	-	-
HCM Control Delay (s)	10.2	-	-	0	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection

Int Delay, s/veh 3.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Vol, veh/h	190	35	0	155	130	0
Future Vol, veh/h	190	35	0	155	130	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	310	310	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	5	20	20	5	20	20
Mvmt Flow	202	37	0	165	138	0

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	202
Stage 1	-	-	202
Stage 2	-	-	165
Critical Hdwy	-	4.3	6.6
Critical Hdwy Stg 1	-	-	5.6
Critical Hdwy Stg 2	-	-	5.6
Follow-up Hdwy	-	2.38	3.68
Pot Cap-1 Maneuver	-	1269	599
Stage 1	-	-	791
Stage 2	-	-	822
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	1269	599
Mov Cap-2 Maneuver	-	-	599
Stage 1	-	-	791
Stage 2	-	-	822

Approach	EB	WB	NB
HCM Control Delay, s	0	0	12.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	599	-	-	1269	-
HCM Lane V/C Ratio	0.231	-	-	-	-
HCM Control Delay (s)	12.8	-	-	0	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.9	-	-	0	-

Intersection												
Int Delay, s/veh	3.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑	↱		↕			↕	
Traffic Vol, veh/h	165	75	145	0	140	9	30	0	0	1	0	28
Future Vol, veh/h	165	75	145	0	140	9	30	0	0	1	0	28
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	310	-	310	310	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	20	5	20	20	5	5	20	20	20	20	20	20
Mvmt Flow	176	80	154	0	149	10	32	0	0	1	0	30

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	159	0	0	80	0	0	600	590	80	585	585	154
Stage 1	-	-	-	-	-	-	431	431	-	154	154	-
Stage 2	-	-	-	-	-	-	169	159	-	431	431	-
Critical Hdwy	4.3	-	-	4.3	-	-	7.3	6.7	6.4	7.3	6.7	6.4
Critical Hdwy Stg 1	-	-	-	-	-	-	6.3	5.7	-	6.3	5.7	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.3	5.7	-	6.3	5.7	-
Follow-up Hdwy	2.38	-	-	2.38	-	-	3.68	4.18	3.48	3.68	4.18	3.48
Pot Cap-1 Maneuver	1318	-	-	1411	-	-	388	397	932	397	399	847
Stage 1	-	-	-	-	-	-	569	553	-	808	737	-
Stage 2	-	-	-	-	-	-	792	733	-	569	553	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1318	-	-	1411	-	-	336	344	932	356	346	847
Mov Cap-2 Maneuver	-	-	-	-	-	-	336	344	-	356	346	-
Stage 1	-	-	-	-	-	-	493	479	-	700	737	-
Stage 2	-	-	-	-	-	-	764	733	-	493	479	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.5	0	16.8	9.6
HCM LOS			C	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	336	1318	-	-	1411	-	-	809
HCM Lane V/C Ratio	0.095	0.133	-	-	-	-	-	0.038
HCM Control Delay (s)	16.8	8.2	-	-	0	-	-	9.6
HCM Lane LOS	C	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0.3	0.5	-	-	0	-	-	0.1

Intersection												
Int Delay, s/veh	7.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑	↱		↕			↕	
Traffic Vol, veh/h	31	190	35	0	155	2	130	0	0	9	0	165
Future Vol, veh/h	31	190	35	0	155	2	130	0	0	9	0	165
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	310	-	310	310	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	20	5	20	20	5	20	20	20	20	20	20	20
Mvmt Flow	33	202	37	0	165	2	138	0	0	10	0	176

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	167	0	0	202	0	0	522	435	202	434	434	166
Stage 1	-	-	-	-	-	-	268	268	-	166	166	-
Stage 2	-	-	-	-	-	-	254	167	-	268	268	-
Critical Hdwy	4.3	-	-	4.3	-	-	7.3	6.7	6.4	7.3	6.7	6.4
Critical Hdwy Stg 1	-	-	-	-	-	-	6.3	5.7	-	6.3	5.7	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.3	5.7	-	6.3	5.7	-
Follow-up Hdwy	2.38	-	-	2.38	-	-	3.68	4.18	3.48	3.68	4.18	3.48
Pot Cap-1 Maneuver	1309	-	-	1269	-	-	438	488	795	502	489	834
Stage 1	-	-	-	-	-	-	700	656	-	795	728	-
Stage 2	-	-	-	-	-	-	712	727	-	700	656	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1309	-	-	1269	-	-	339	476	795	492	477	834
Mov Cap-2 Maneuver	-	-	-	-	-	-	339	476	-	492	477	-
Stage 1	-	-	-	-	-	-	682	639	-	775	728	-
Stage 2	-	-	-	-	-	-	562	727	-	682	639	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.9	0	22.7	10.8
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	339	1309	-	-	1269	-	-	805
HCM Lane V/C Ratio	0.408	0.025	-	-	-	-	-	0.23
HCM Control Delay (s)	22.7	7.8	-	-	0	-	-	10.8
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %ile Q(veh)	1.9	0.1	-	-	0	-	-	0.9

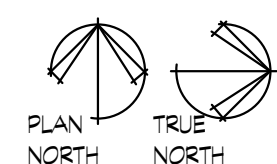
- HOW MANY SAND/OIL INTERCEPTORS ARE NEEDED?



2 - ALL WINDOW FRAMES TO HAVE POCKET FILLERS.

TRANSWEST

A1.1



TRANSWEST - PHASE 3

13525 CO RD 8, FORT LUPTON, CO 80621

TRANSWEST

PLAN UPDATE - 02/02/2021

Issued For SD:
Issued For DD:
Issued For Permit:
Issued For Construction:

Revision Number Revision Date

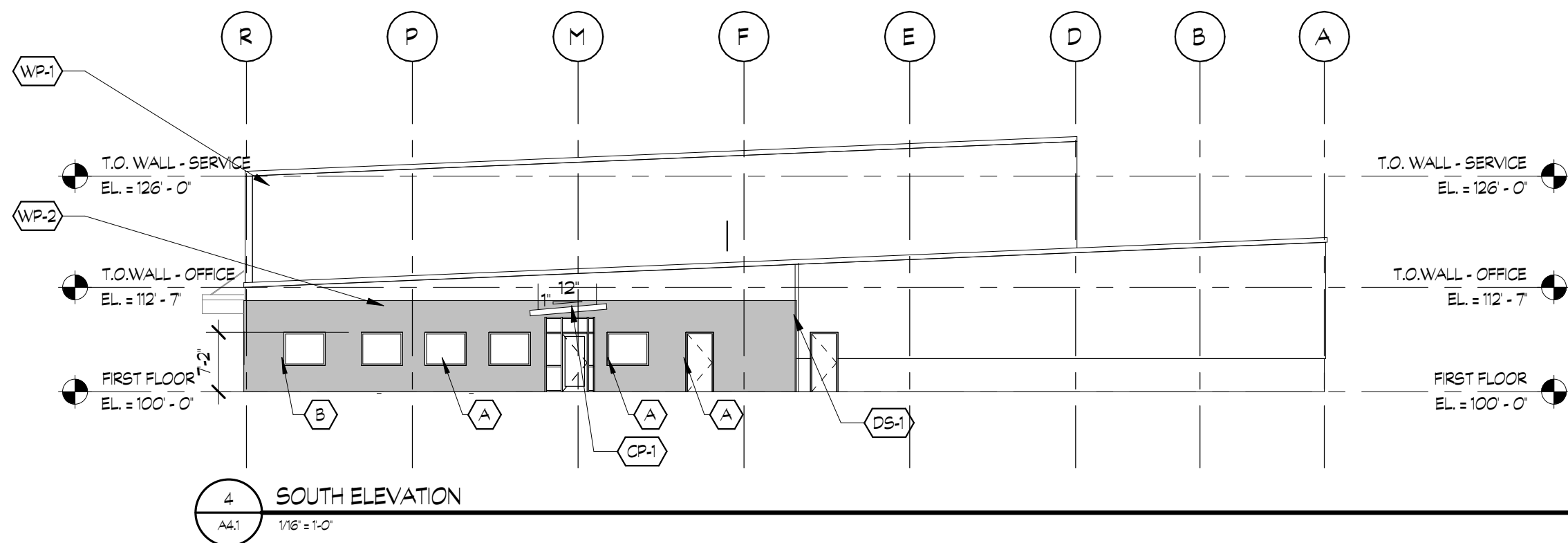
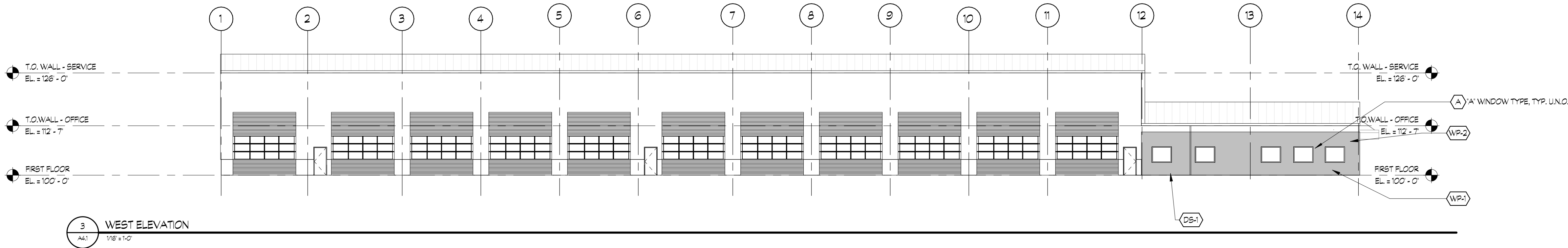
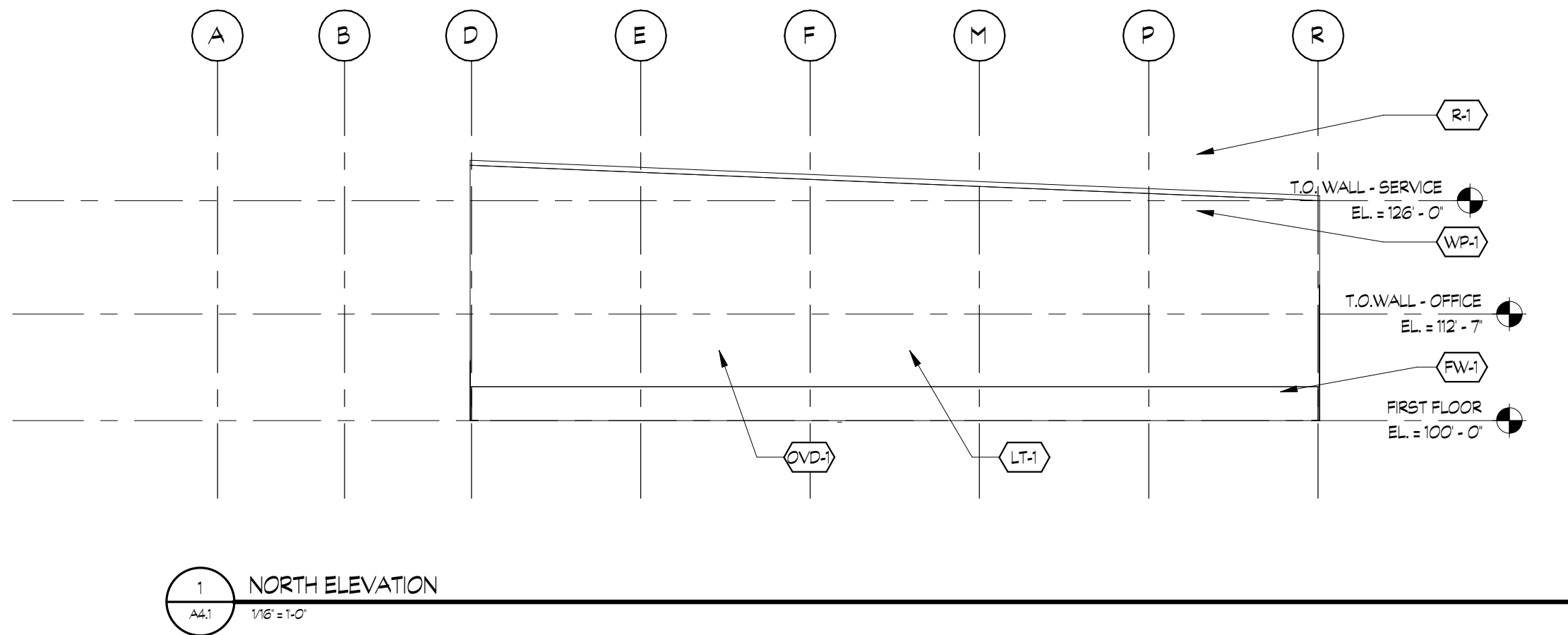
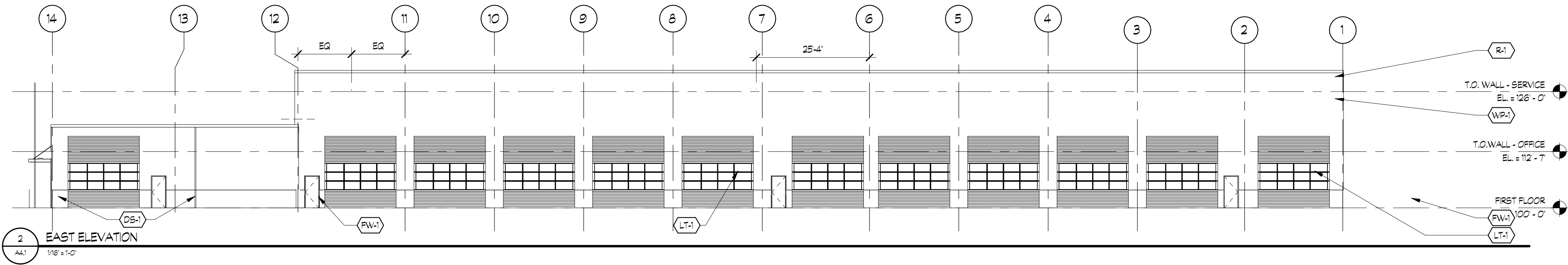
Seal:

19006

Plot Date: 2/11/2021 3:04:36 PM

BUILDING
ELEVATIONS

A4.1



EXTERIOR MATERIALS						
KEYNOTE	DESCRIPTION	MATERIAL	MANUFACTURER	PRODUCT NAME	COLOR NAME	REMARKS
CP-1	PREFABRICATED CANOPY	ALUMINUM	MAPES	LUMIDECK	RED	PEMB MFR. PROVIDED BACKING
DS-1	PREFABRICATED DOWNSPOUT	ALUMINUM				PREFINISHED DOWNSPOUT
FW-1	PEMB WALL PANEL	CONCRETE FOUNDATION WALL			PAINTED TO MATCH SUMMIT GRAY	RE: STRUCTURAL
LT-1	EXTERIOR LIGHT					RE: ELECTRICAL
OVD-1	OVHD. DOOR	ALUM/GLASS	CLOPAY	14' X 16' HIGHLIFT	MATCH REGAL WHITE	RE: PEMB MFR. DRAWINGS
R-1	PRE-FINISHED STANDING SEAM METAL ROOF	PRE-FINISHED STANDING SEAM METAL ROOF	AMERICAN	STANDING SEAM 360, 24 GA.	REGAL WHITE	RE: PEMB MFR. DRAWINGS
WP-1	PEMB WALL PANEL	PEMB WALL PANEL	AMERICAN	VEB-RB, 24 GA.	REGAL WHITE	RE: PEMB MFR. DRAWINGS
WP-2	PEMB WALL PANEL	PEMB WALL PANEL	AMERICAN	CECOROC, 20 GA.	SUMMIT GRAY	RE: PEMB MFR. DRAWINGS



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: Ed Jennings (PE)
From: Roy Vestal
Date: March 26, 2021
Subject: Transwest Truck & Trailer Phase 3 Site Plans & Amended Plat
(LUP2021-0009; AMD2021-0002; SPR2021-0003 & SPR2021-0004)
Public Works Review

Public Works has reviewed the submitted documents for the above referenced development project with the following comments for inclusion with the Site Plan submittal. Be advised, review of construction drawings is for general compliance with city standards. There may be additional concerns as this design develops.

1. Site Plan

- a. The water line will require an easement dedication by separate document, 20' wide.
- b. Add acknowledgement and signature block for owner accepting maintenance responsibilities for the Private drainage facilities on site.

2. 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.

3. Utilities

a. Services

- i. CD's indicate a ¾" domestic water service tap.
 1. CBT required is 1.3 Shares = \$78,000.00 cash in lieu
 2. WTP PIF = \$9,825.00 (effective April 5, 2021)
- ii. CD's indicate a 4" sanitary sewer service
 1. WWTP PIF = \$19,000.00 (effective April 5, 2021)

b. Water - Chapter 3

- i. Sheet 9: The east - west leg of the water line on the north side of the new building should be centered in the easement, which would place it 10-feet away from the building.

- ii. Backflow prevention assemblies shall be tested by a Certified Cross-Connection Control Technician upon installation and tested at least annually, thereafter.
- iii. Plumbing plans should identify back flow prevention devices and will require inspection by a certified backflow prevention technician and registration on the City's Aqua Flow web site. The backflow device will require annual inspections and entry to the City's Cross Connection Inspection Control system (in accordance with Section 13-85 of the City Municipal Code).

c. Sanitary Sewer - Chapter 4

- i. Sheet 12 - Proposed sanitary service profile, why not do one lift station and use a pressure service line to a point where it will gravity flow to the main? Two lift station seem too complex, a grinder pump and pressure line would be more efficient and less maintenance.
- ii. Need details and design for lift station or grinder pump / pressure line.

d. Storm Drainage - Chapter 5

- i. Drainage Study as submitted is acceptable.
- ii. Please add retention pond maintenance requirements.
- iii. Storm sewer outfalls to the retention ponds should be provided with a toe wall. Need detail of "Type M RIPRAP".
- iv. Provide seeding specification for retention ponds with the Construction Drawings. Would like to avoid the weed traps that have developed during the first 2 phases.

e. Traffic Control - Chapter 8

- i. The Traffic Study submitted is the original with the Phase 3 building drawing added at the end. At a minimum, I need to see what the additional traffic from the Phase 3 construction will generate.

f. Construction Notes:

- i. General Water-Sewer #27 - 4" sewer service minimum slope is 2%.

4. **A Public Works Permit** will be required for construction of the water line, service tap and sanitary service.

There may be additional concerns as this design develops.

March 25, 2021

City of Fort Lupton Planning Department
130 South McKinley Ave.
Fort Lupton, CO 80621

Re: LUP2021-0009; AMD2021-0002; SPR2021-0003 & SPR2021-0004 - 1st Submittal - Transwest Truck & Trailer Phase 3 Site Plans & Amended Plat

Dear Magaly Marales-Tejada:

On behalf of United Power, Inc., thank you for inviting us to review and comment on the 1st submittal for Transwest Truck & Trailer Phase 3 Site Plans for lot 1 & 2 and the amended plat. After review of the information:

- **Lot Line** - We have no concern or objection to vacating the north line and the new proposed lot line for lots 1 & 2, which now would run straight north/south.
- **Plat Easements** - We request an 8'-10' dry utility easements around the perimeter of lot 1 & lot 2.
 - According to the Villano Minor (R#4081664), there should be a utility easement on the west side of lot 2. Can we please show this on the plat and the site plans?
 - I am assuming the 8' U.E. that runs north/south between lot 1 & 2 goes the entire length of lot 1 & 2. Please ensure it does. Please make note of that on the site plans.
 - We request an 8' to 10' U.E. along the north side of lot 1 & 2. Please call it out on the site plan.
 - We request an 8' to 10' U.E. along the east side lot 1.
 - According to the Transwest North Minor Subd plat (R#4380392) there is a 20' Non-Exclusive Dry U.E. along the south end of lots 1 & 2. Can we please show this on the plat and site plans?
- **Site plans** – Could we include all existing utility easements from plats reception # 4081664 & reception # 4380392 and any proposed utility easements to the proposed plat be placed on the site plans for lot 1 & 2?

Please have the property owner/developer/contractor submit an application for new or upgraded service 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 document(s). Obtaining easements via a separate document 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 look forward to safely and efficiently providing reliable electric power and outstanding service.

Thank you,

A handwritten signature in black ink, reading "Samantha Riblett". The signature is fluid and cursive, with the first name "Samantha" written in a larger, more prominent script than the last name "Riblett".

Samantha Riblett
United Power, Inc.
Right of Way Administrative Assistant
O: 303-637-1324 | Email: platreferral@unitedpower.com

Magaly Morales-Tejada

From: Kristen Thompson <kthompson@northernwater.org>
Sent: Monday, March 8, 2021 2:22 PM
To: Magaly Morales-Tejada
Cc: Maria Lancto; Todd Hodges; Alyssa Knutson
Subject: RE: Referral Response Request: Transwest Truck & Trailer Phase 3 Site Plans & Amended Plat (LUP2021-0009; AMD2021-0002; SPR2021-0003 & SPR2021-0004)

Magaly,

We do not have any comments on this request.

Thank you
Kris

Disclaimer Notice: An allotment of Colorado-Big Thompson water is subject to the Water Conservancy Act, C.R.S 37-45-101 et seq, the authority of the Board of Directors of the Northern Colorado Water Conservancy District, and other relevant laws and regulations. The information provided in this email is not binding on Northern Water because the legal rights to Colorado-Big Thompson Project Allotments are subject to the continuing discretion of the Board of Directors of Northern Water and other legal limitations and requirements. Northern Water staff and counsel cannot provide you with legal advice, and you are advised to seek legal counsel with respect to the subject matter of this



Kristen Thompson | Inclusion Specialist
220 Water Ave | Berthoud, CO 80513
Direct: 970-622-2237
Main: 800-369-RAIN (7246)
www.northernwater.org
[Facebook](#) | [Twitter](#) | [Instagram](#) | [LinkedIn](#)

From: Magaly Morales-Tejada <MMTejada@Fortluptonco.gov>
Sent: Monday, March 8, 2021 1:45 PM
Cc: Maria Lancto <MLancto@Fortluptonco.gov>; Todd Hodges <thodges@Fortluptonco.gov>; Alyssa Knutson <AKnutson@Fortluptonco.gov>
Subject: Referral Response Request: Transwest Truck & Trailer Phase 3 Site Plans & Amended Plat (LUP2021-0009; AMD2021-0002; SPR2021-0003 & SPR2021-0004)

External Message - Please be cautious when replying or opening links or attachments in this email

Good Afternoon,

The documentation located at the following link is submitted to you for review and recommendation for an amended plat and site plans being reviewed by the City of Fort Lupton. The application documents can be reviewed at the following link: <https://www.fortluptonco.gov/DocumentCenter/Index/584>.

Any comments you consider relevant to this request would be appreciated. Please reply by **March 29, 2021** 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, April 8, 2021 at 6:00 PM; and
- City Council: Tuesday, April 20, 2021 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



The information transmitted is intended only for the person or entity to which it is addressed and may contain CONFIDENTIAL material. If you receive this information in error, please delete or destroy the information.

**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 site plan known as the Transwest Truck and Trailer Phase 3 Lot 1 Site Plan located at 13525 County Road 8 Fort Lupton, Colorado in the 'I-1' Light Industrial Zone District pursuant to the City of Fort Lupton Municipal Code Notice Requirements.

The public hearing is to be held before the Planning Commission on April 8, 2021, at 6:00 P.M., and before the City Council on April 20, 2021, at 7:00 P.M. or as soon as possible thereafter.

The public hearing shall be held at the Fort Lupton City Hall, 130 S. McKinley Avenue in Fort Lupton, Colorado. In the event that there are City Hall closures due to COVID-19 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

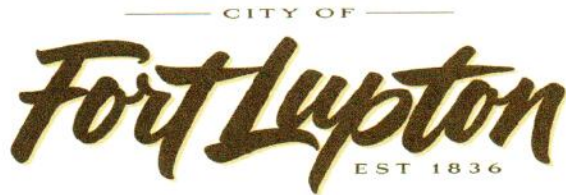
ALL INTERESTED PERSONS MAY ATTEND

LEGAL DESCRIPTION

A PARCEL OF LAND IN THE CITY OF FORT LUPTON, COLORADO LOCATED IN THE SW1/4, SE1/4, SECTION 17, TOWNSHIP 1 NORTH, RANGE 66 WEST OF THE 6TH PRINCIPAL MERIDIAN AND MORE PARTICULARLY DESCRIBED AS FOLLOWS: LOT 1 TRANSWEST NORTH MINOR SUBDIVISION-FIRST AMENDMENT, CITY OF FORT LUPTON, COUNTY OF WELD, STATE OF COLORADO CONTAINING 38.242 ACRES MORE OR LESS.

Legal Ad No.: FLP222263

First Publication: March 24, 2021
Last Publication: March 24, 2021
Published In: Fort Lupton Press



COME PAINT YOUR FUTURE WITH US

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

Sign Posting Affidavit

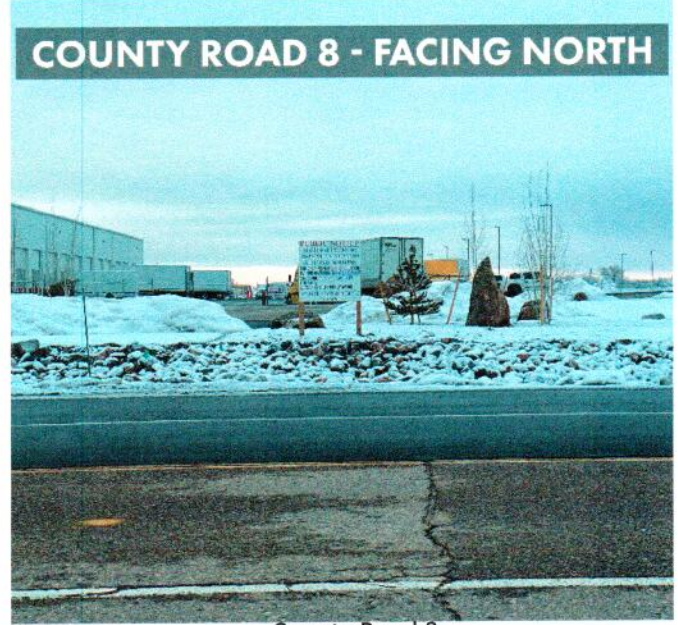
Transwest Truck and Trailer Phase III

Project No. LUP2021-0009

Plan Nos. AMD2021-0002; SPR2021-0003 & SPR20201-0004



County Road 8



County Road 8

I, Kyle Schmidt hereby acknowledge that the aforementioned property was posted in accordance with City Codes. Said public hearing notice was posted on this 23rd day of March 2021

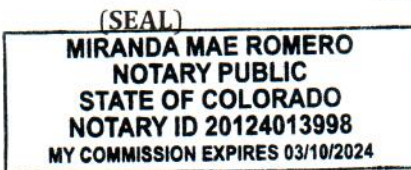
[Signature] - GEP Investments

Signature of Owner or Owner's Representative

The foregoing instrument was acknowledged before me by Kyle Schmidt, this 23rd day of March, 2021. Witness my hand and

seal. My commission expires 3-10-2024.

[Signature]
Notary Public





CERTIFICATE OF MAILING

I, the undersigned, hereby certify that on the 22nd day of March, 2021, a true and correct copy of the foregoing Notice of Public Hearings and annexation map for the Transwest Truck and Trailer Phase 3 Site Plans was sent via U.S. Mail, postage pre-paid, to the following addresses:

FORT LUPTON FIRE PROTECTION DISTRICT
1121 DENVER AVE
FORT LUPTON, CO 80621

KAMBER R MORRISON
ANDREW R MORRISON
13757 COUNTY ROAD 8
FORT LUPTON, CO 80621

JOYCE KAY HUETT
RICHARD A HUETT
13759 COUNTY ROAD 8
FORT LUPTON, CO 80621

VILLANO BROTHERS FAMILY
INVESTMENTS LLC
13050 COUNTY ROAD 10
FORT LUPTON, CO 80621

KATHERINE A DEAN
THEODORE E DEAN
13746 COUNTY ROAD 9
FORT LUPTON, CO 80621

VERYL M SCHOEN
PO BOX 68
FORT LUPTON, CO 80621

KEN BROUGH
13767 COUNTY ROAD 8
FORT LUPTON, CO 80621

HALLIBURTON ENERGY SERVICES INC
C/O PROPERTY TAX DEPT
PO BOX DRAWER 1431
DUNCAN, OK 73536

DARRELL G PHILLIPS
PO BOX 483
PLATTEVILLE, CO 80651

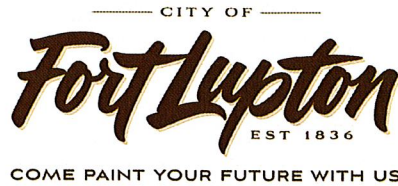
ADAM HENRY ROBILLARD
LACY KAE ABFALTER
1013 COUNTY ROAD 7
ERIE, CO 80516

BRANNAN SAND AND GRAVEL
COMPANY LLC
2500 BRANNAN WAY
DENVER, CO 80229

WHEAT RIDGE GROUP LLC
7310 W 52ND AVE
APT A174
ARVADA, CO 80002

RJ ENTERPRISES 1
13749 COUNTY ROAD 9
FORT LUPTON, CO 80621

City Official



**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 two site plans known as the Transwest Truck and Trailer Phase 3 Lot 1 Site Plan located at 13525 County Road 8 and the Transwest Truck and Trailer Phase 3 Lot 2 Site Plan located at 13517 County Road 8 Fort Lupton, Colorado in the 'I-1' Light Industrial Zone District pursuant to the City of Fort Lupton Municipal Code Notice Requirements.

The public hearings are to be held before the Planning Commission on April 8, 2021, at 6:00 P.M., and before the City Council on April 20, 2021, 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 there are City Hall closures due to COVID-19 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

ALL INTERESTED PERSONS MAY ATTEND

LOT 1 LEGAL DESCRIPTION

A PARCEL OF LAND IN THE CITY OF FORT LUPTON, COLORADO LOCATED IN THE SW1/4, SE1/4, SECTION 17, TOWNSHIP 1 NORTH, RANGE 66 WEST OF THE 6TH PRINCIPAL MERIDIAN AND MORE PARTICULARLY DESCRIBED AS FOLLOWS:

LOT 1 TRANSWEST NORTH MINOR SUBDIVISION-FIRST AMENDMENT, CITY OF FORT LUPTON, COUNTY OF WELD, STATE OF COLORADO CONTAINING 38.242 ACRES MORE OR LESS.

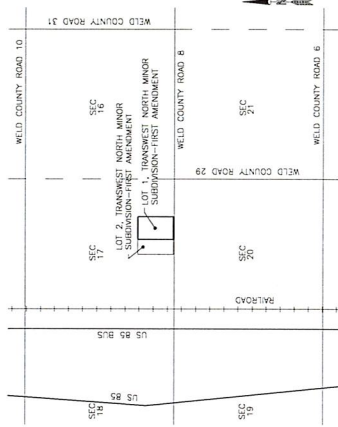
LOT 2 LEGAL DESCRIPTION

A PARCEL OF LAND IN THE CITY OF FORT LUPTON, COLORADO LOCATED IN THE SW1/4, SE1/4, SECTION 17, TOWNSHIP 1 NORTH, RANGE 66 WEST OF THE 6TH PRINCIPAL MERIDIAN AND MORE PARTICULARLY DESCRIBED AS FOLLOWS:

LOT 2, TRANSWEST NORTH MINOR SUBDIVISION-FIRST AMENDMENT, CITY OF FORT LUPTON, COUNTY OF WELD, STATE OF COLORADO CONTAINING 38.242 ACRES MORE OR LESS.

ADDITIONAL INFORMATION AND DOCUMENTS ON THIS APPLICATION CAN BE FOUND AT BIT.LY/FLDEVELOPMENT AND SCROLLING DOWN TO THE ROW TITLED: TRANSWEST TRUCK AND TRAILER PHASE 3 SITE PLANS AND AMENDED PLAT

TRANSWEST TRUCK AND TRAILER, PHASE 3
LOT 1, TRANSWEST NORTH MINOR SUBDIVISION—FIRST AMENDMENT
PART OF THE SW1/4, SE1/4, SECTION 17, TOWNSHIP 1 NORTH, RANGE 66 WEST
PROJECT NO. _____ & PLAN NO. _____



VICINITY MAP
1"=2000'

PROPERTY DESCRIPTION:
A PORTION OF LAND IN THE CITY OF FORT LUTON, COLORADO LOCATED IN THE SW1/4, SE1/4, SECTION 17, TOWNSHIP 1 NORTH, RANGE 66 WEST OF THE 6TH PRINCIPAL MERIDIAN AND MORE PARTICULARLY DESCRIBED AS FOLLOWS:
LOT 1, TRANSWEST NORTH MINOR SUBDIVISION—FIRST AMENDMENT, CITY OF FORT LUTON, COUNTY OF WELD, STATE OF COLORADO CONTAINING 38.242 ACRES MORE OR LESS.

DONOR'S APPROVAL:

KNOW ALL MEN BY THESE PRESENTS, THAT GEP INVESTMENTS, INC., BEING THE SOLE OWNER OF THE LAND DESCRIBED HEREIN, AND THE OWNER OF THE LAND DESCRIBED HEREIN, HAVE HEREBY SET OUR HANDS AND SEALS THIS ____ DAY OF _____, 2021.

GEORGE EDWARDS, PRESIDENT

THE FOLLOWING INSTRUMENT WAS ACKNOWLEDGED BEFORE ME BY GEORGE EDWARDS ON THIS ____ DAY OF _____, 2021. WITNESS MY HAND AND SEAL.

MY COMMISSION EXPIRES: _____

CITY ENGINEER'S APPROVAL

APPROVED THIS ____ DAY OF _____, 2021

CITY WATER AND SEWER DEPARTMENT APPROVAL

APPROVED THIS ____ DAY OF _____, 2021

CITY ADMINISTRATOR'S APPROVAL

APPROVED THIS ____ DAY OF _____, 2021

PLANNING COMMISSION RECOMMENDATION

APPROVED THIS ____ DAY OF _____, 2021

BY RESOLUTION NO. _____

CHAMBERSON, FORT LUTON PLANNING COMMISSION

NOTARY PUBLIC

CITY ENGINEER

DIRECTOR OF PUBLIC WORKS

CITY ADMINISTRATION

ATTEST:

NOTES:

1. THE PROPERTY SHALL BE MAINTAINED TO THE CURB, OR

2. THE PROPERTY SHALL BE MAINTAINED TO THE CURB, OR

3. ANY ABOVE GROUND FUEL TANKS REQUIRE A SEPARATE

4. LIGHTING ON THE SITE SHALL BE MAINTAINED SO THAT

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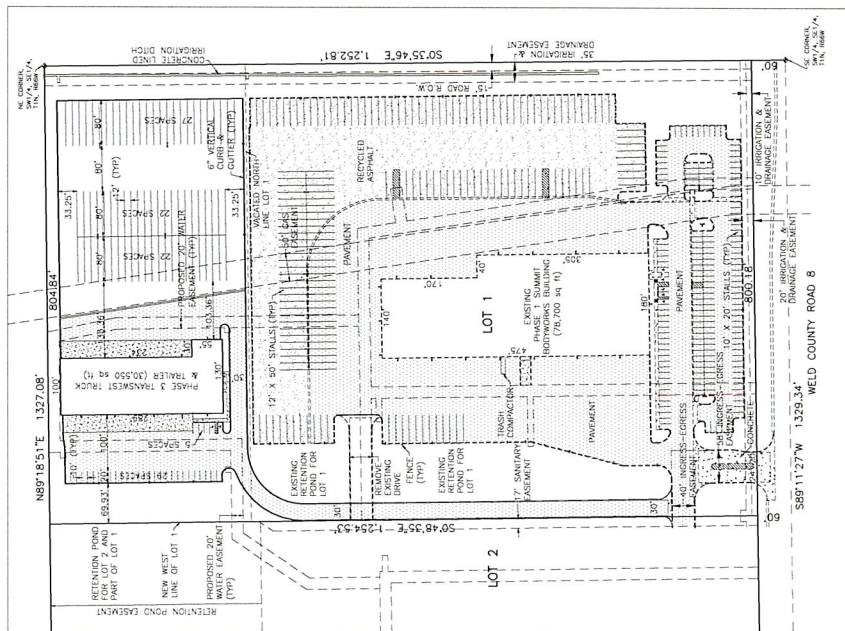
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WELD COUNTY ROAD 12

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RESOLUTION NO. P2021-011

A RESOLUTION OF THE PLANNING COMMISSION OF FORT LUPTON RECOMMENDING TO CITY COUNCIL APPROVAL OF THE TRANSWEST TRUCK AND TRAILER PHASE 3 LOT 2 SITE PLAN FOR A PROPERTY AT 13517 COUNTY ROAD 8 AND LOCATED IN THE SOUTHWEST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 17, TOWNSHIP 1 NORTH, RANGE 66 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF WELD, STATE OF COLORADO.

WHEREAS, the Planning Commission held a public hearing on April 8, 2021, for the purpose of reviewing GEP Investments, Inc.'s application for a site plan for an existing trailer manufacturing facility; and

WHEREAS, after review of the application and supporting information, the Planning Commission finds that the site plan conforms to Colorado Revised Statutes and City codes and policies therein, and

WHEREAS, all legal requirements for the public hearing have been met including publication of the legal notice in the Fort Lupton Press, mailing of public hearing notices to adjacent property owners within 100 feet, and posting of the hearing on the site.

NOW THEREFORE BE IT RESOLVED, the Planning Commission has taken into consideration all referral comments and any citizen testimony in response to this application. Based upon the facts presented on this date, the Planning Commission hereby recommends approval of the Transwest Truck and Trailer Phase 3 Lot 2 Site Plan, conditional upon the following:

- I. Prior to recording the site plan map:
 - A. The title of the map shall include Project No. LUP2021-0009& Plan No. SPR2021-0003.
 - B. Any redline comments provided by staff shall be made to the site plan map.
 - C. A set of Mylars of the Transwest Truck and Trailer Phase 3 Amended Plat shall be submitted for recording.
 - D. Applicant shall provide written evidence that the comments from United Power have been adequately addressed.
 - E. Applicant shall provide written evidence that the comments from the Public Works Director have been adequately addressed.
 - F. Applicant shall dedicate by separate document a 20' wide water line easement per the direction of the Public Works Director.

I. The following notes shall be placed on the site plan map:

1. Lighting on the site shall be maintained so that light is directed downwards and shall not spill onto adjacent properties.
2. Dead and dying landscape material shall be replaced at the earliest reasonable date.
3. The City reserves the right to reevaluate traffic impacts in the future if there is an increase from what was represented to the City in evaluating the site plan.
4. The property shall be maintained to the curb, or roadway if no curb exists.
5. Any proposed signage shall be submitted to the City for review and permitting.

DONE THIS 8th DAY OF APRIL, 2021, BY THE PLANNING COMMISSION FOR THE CITY OF FORT LUPTON, COLORADO.

Chairman

ATTEST:

Planning Director

**TRANSWEST TRUCK AND TRAILER PHASE 3 LOT 2 SITE PLAN
STAFF REPORT
PROJECT NO. LUP2021-0009 & PLAN NO. SPR2021-0004**

PROJECT DESCRIPTION

Project No.: LUP2021-0009 / Plan No.: SPR2021-0004

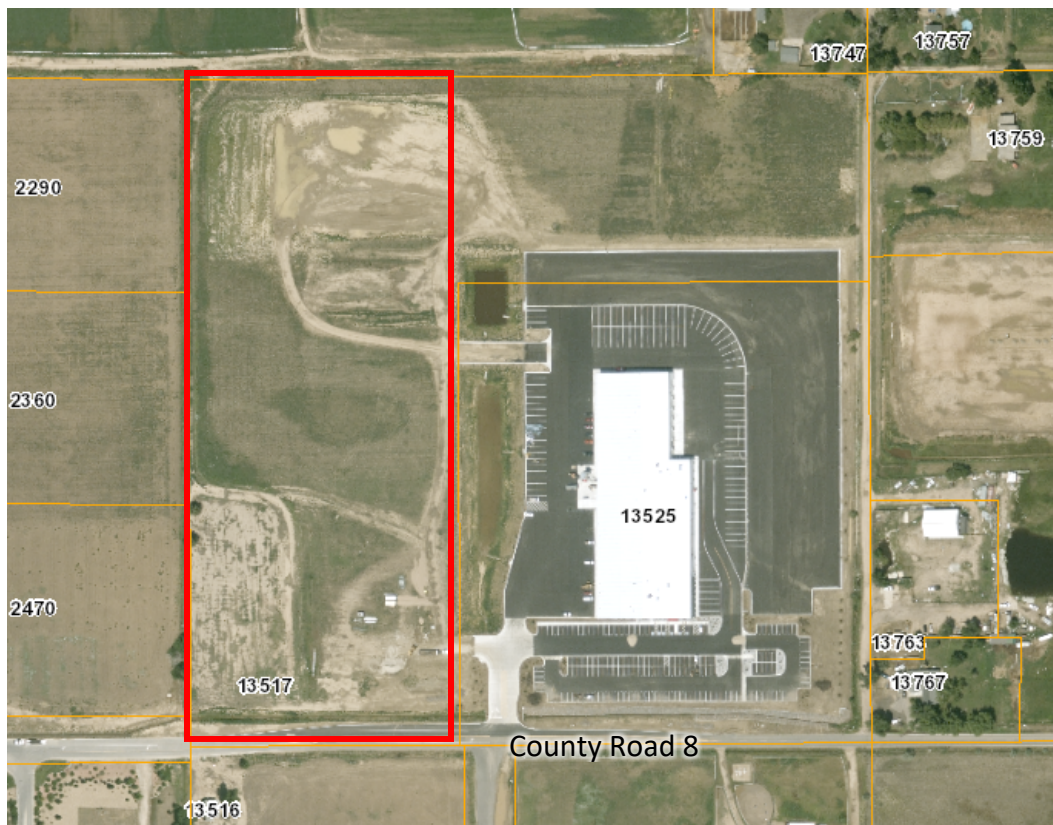
Project Name: Transwest Truck and Trailer Phase 3 Lot 2 Site Plan

Owner's Name: GEP Investments, Inc. ("Applicant")

Representative: Kyle Schmidt, GEP Investments Inc. ("Representative")

Location of Request:

The site that is the subject of this application is located at 13517 County Road 8 Fort Lupton, Colorado ("Property"). The Property is located in the Southwest Quarter of the Southeast Quarter of Section 17, Township 1 North, Range 66 West of the Sixth Principal Meridian, Fort Lupton, Colorado.

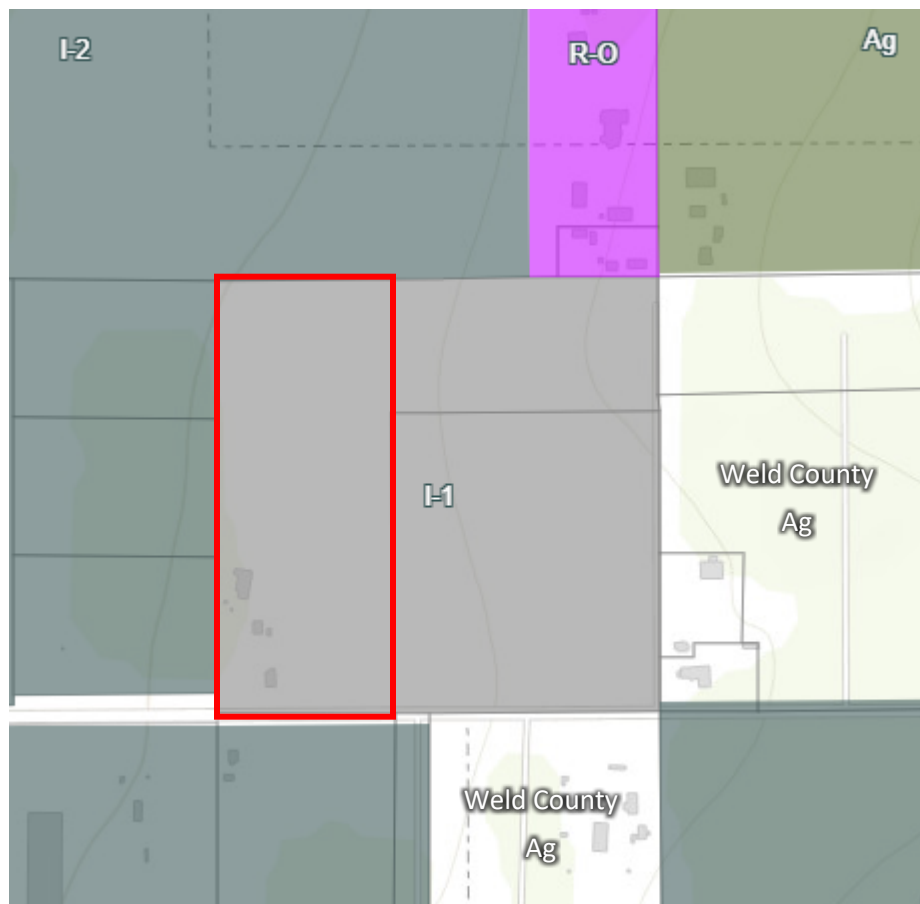


Nature of Request:

The Applicant has submitted a request for concurrent review of an amended plat and two site plans. Staff has conditionally approved the amended plat, and is recommending conditional approval of the site plans.

The Transwest Truck and Trailer Phase 3 Lot 2 Site plan is for the westernmost lot. Lot 2 currently contains a 79,200 square foot trailer manufacturing facility, as well as a 6,000 square foot storage building and associated parking. There are no proposed changes to the land use of lot 2, however the amended plat that was concurrently submitted would impact the lot line and utility easements of the lot, requiring a new site plan.

The property is surrounded by Industrial zoning.



Site Size: 15.146 acres, more or less.

Zone District: I-1 Light Industrial.

Proposed Use: Continuation of the existing manufacturing facility.

Existing Use: Light industrial business used for metal fabrication activities, including bending, forming, welding and assembly. The products are mounted on truck chassis.

Hearing Dates: Planning Commission – April 8, 2021 at 6:00 PM; and
City Council – April 20, 2021 at 7:00 PM

Hearing Location: Planning Commission: Held virtually via GoToMeeting due to COVID 19.
City Council: 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

The Property was annexed into Fort Lupton in 2006, and was initially zoned R-O Residential Office (the Routzen Annexation & Initial Zoning). The zoning was changed in 2016 to I-1 Light Industrial. In 2017, City Council approved a minor subdivision and site plan, known as the Transwest North Minor Subdivision and Summit Body Works Site Plan. In 2019, a site plan for lot 2 of the Transwest North Minor Subdivision was approved, which was amended administratively in 2020.

An amended plat was submitted for concurrent review with this site plan, which has been conditionally approved by staff.

APPLICATION PROCESS

The Applicant is requesting a site plan approval for an existing metal fabrication facility. The site plan process is required due to new lot lines and utility easements that were conditionally approved as part of the Transwest Truck and Trailer Phase 3 Amended Plat. Pursuant to Section 16-170 of the Code, site plans are required as a step in the building permit review process for all multi-family, commercial or industrial development.

After required public notice of a site plan, 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 separately approve, approve with conditions or deny the site plan and special use permit. 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 site plan, referral agency comments, Planning Commission recommendation and any public testimony, and shall separately 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 Zoning Regulations require published notice of the hearings at least fifteen (15) days prior to the hearings. The Planning Commission and City Council hearings were published in the Fort Lupton Press on March 24, 2021.

Notice of the public hearings was posted on March 23, 2021 at the Property, which is at least fifteen (15) days prior to the hearings, as required by the Zoning Regulations.

Notice was mailed to neighbors within one-hundred (100) feet of the Property on March 22, 2021.

CONFORMANCE WITH CITY STANDARDS, REGULATIONS AND POLICIES

The property is located within the I-I Light Industrial Zone District. Manufacturing, fabrication, processing, distribution or assembly facilities are permitted in the I-1 Heavy Industrial Zone District; provided that all limitations of external effects required under these regulations are met. The use complies with the zoning for the Property, and conditions of approval will address any potential external effects.

CONFORMANCE WITH THE COMPREHENSIVE PLAN

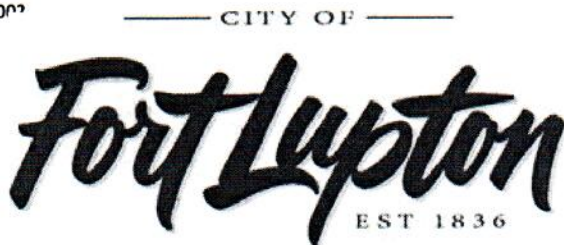
The Fort Lupton Comprehensive Plan designates this area for industrial land uses. This designation allows for a mix of heavy and light industrial users as well as office development, intended to provide an appropriate environment for higher intensity users. These areas should be utilized to attract major employers and support economic development that will complement residential growth within the community. Developments within this designation should be carefully reviewed to account for potential impacts on adjacent land uses from high intensity operations. The proposed use conforms to this land use type.

REFERRALS

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

Buildings / Grounds Manager	Building Inspector	OMI
City Attorney	GIS Specialist	Police Chief
Public Works Director	Golf Course Manager	Finance Director
Fort Lupton Fire Protection District	CDOT	United Power
Comcast	CenturyLink	Xcel Energy
Weld County Department of Planning	Weld County Public Works	NCWCD
Fulton Ditch Company		

***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.***



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: GEP Investments, Inc.
 Company: Transwest Truck Trailer RV
 Phone: 303-301-7510 Email: geidsness@transwest.com
 Address: 20770 E. 176 Frontage Rd., Brighton, CO 80603
 Preferred method of contact? Email: Phone: Mail:
- 2) Representative Name: Kyle Schmidt
 Company: GEP Investments
 Phone: 303-301-7436 Email: kschmidt@transwest.com
 Address: 6045 Lipan Street, Denver, CO 80221
 Preferred method of contact? Email: Phone: Mail:
- 3) Billing Contact (where invoices should be directed to): Kyle Schmidt (same as above)
 Billing Company: _____
 Phone: _____ Email: _____
 Address: _____

B. SITE DESCRIPTION

Site Address: 13525 CR 8, Fort Lupton, CO
 Parcel Number: 147117401001
 Existing Zone Classification: I-1 Proposed Zone Classification: _____
 Water Type: Municipal Name: COFL
 Sewage Type: Municipal District Name or Location Hauled to: COFL

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: Transwest Truck & Trailer Phase 3

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

289ft x 130ft Metal Service Building (PEMB)

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:  Date: 2/3/21

Owner Certification

I hereby certify that I am the legal owner of record of the property that is the subject of this application. I 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:  Date: 2-3-21

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 <https://www.fortluptonco.gov/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@fortluptonco.gov.

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@fortluptonco.gov.

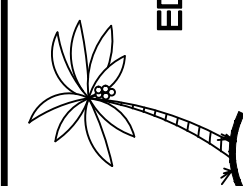


2/17/2021

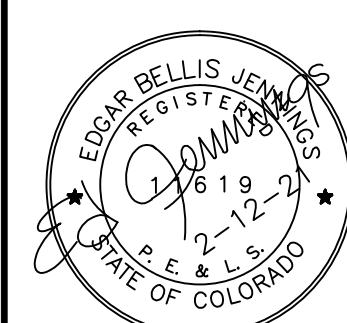
Re: GEP Investments – Summit Van Bodies Phase II

Summit Bodyworks Truck and Van Bodies is a manufacturing plant that operates between the hours of 6am and 5pm, Monday through Friday. There are approximately 50 employees and are a mix of production, sales, and administrative personnel. This is a completed project with the exception of a 5,000 SF cold storage building just North of the existing building. This storage building is approved but due to the Pandemic, our metal building is extremely delayed. There are no further plans to develop this lot.

PART OF THE SW1/4, SE1/4, SECTION 17, TOWNSHIP 1 NORTH, RANGE 66 WEST
PROJECT NO. _____ & PLAN NO. _____



BEFORE YOU DIG
FOR BURIED CABLE LOCATIONS
CALL U.N.C.C. 48 HOURS BEFORE DIGGING
1-800-922-1987



GENERAL LEGEND

	EXISTING FIRE HYDRANT
	EXISTING WATER MAIN VALVE
	EXISTING WATER MAIN
	PROPOSED STORM INLETS
	EXTERIOR LIGHT POLES
	EXTERIOR LIGHT, BUILDING MOUNTED
	PROPERTY LINE
	EASEMENT
	EDGE

1. THE PROPERTY SHALL BE MAINTAINED TO THE CURB, OR ROADWAY IF NO CURB EXISTS.
2. DEAD AND DYING LANDSCAPE MATERIAL SHALL BE REPLACED AT THE EARLIEST REASONABLE DATE.
3. ANY ABOVE GROUND FUEL TANKS REQUIRE A SEPARATE SPECIAL USE PERMIT PRIOR TO PLACEMENT AND ANY REQUIRED PERMITS SHALL BE SUBMITTED TO THE PLANNING DEPARTMENT.
4. LIGHTING ON THE SITE SHALL BE MAINTAINED SO THAT LIGHT IS DIRECTED DOWNWARD AND SHALL NOT SPILL ONTO ADJACENT PROPERTIES.

BEFORE YOU DIG
FOR BURIED CABLE LOCATIONS
CALL U.N.C.C. 48 HOURS BEFORE DIGGING
1-800-922-1987

Bar Scale

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1" = 100'

[illegible]

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Dwg No:	SP4B6107.DWG
Hor:	1" = 100'
Ver:	
Date:	2-12-21
Des:	EJ
Dwg:	EJ
Chk:	EJ

Title:	SITE PLAN
Project:	LOT 2, TRANSWEST NORTH MINOR SUBDIVISION—FIRST AMENDMENT, FORT LUPTON, CO.
For:	GEP INVESTMENTS, INC.

FINAL DRAINAGE REPORT

FOR

**TRANSWEST TRUCK AND TRAILER
(PHASE 3)**

AND

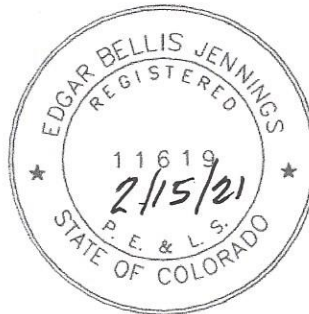
AMENDMENTS TO DRAINAGE REPORTS FOR PHASES 1 AND 2

LOCATED IN LOTS 1 & 2, TRANSWEST NORTH MINOR SUBDIVISION-FIRST AMENDMENT,
A PART OF THE SW 1/4, SE/4, SECTION 17, T1N, R66W
FORT LUPTON, COLORADO

Prepared by

Ed Jennings PE & PLS
PO Box 200662
Denver, Co. 80220
(303)388-1867

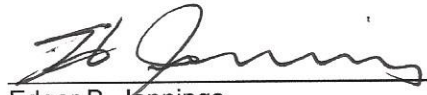

Edgar B. Jennings PE & PLS No. 11619



File No: DR9B6107
February 15, 2021

STANDARD STATEMENT 1

I hereby affirm that this report and plan for drainage design of the development, TRANSWEST TRUCK AND TRAILER (PHASE 3) and revisions to drainage designs for PHASES 1 and 2, located in Lots 1 and 2, TRANSWEST NORTH MINOR SUBDIVISION-FIRST AMENDMENT, was prepared by me in accordance with the provisions of the City of Fort Lupton Storm Drainage Design and Technical Criteria for the owner thereof. I understand that the City of Fort Lupton does not and will not assume liability for drainage facilities designed by others. I am also aware of the provisions of the City CODE as it pertains to the City's review.



Edgar B. Jennings
State of Colorado PE&PLS no. 11619

2-15-21
Date



STANDARD STATEMENT 2

GEP Investments, LLC, hereby affirms that the drainage facilities for the development, TRANSWEST TRUCK AND TRAILER (PHASE 3) and revisions to drainage designs for PHASES 1 and 2, located in Lots 1 and 2, TRANSWEST NORTH MINOR SUBDIVISION-FIRST AMENDMENT, shall be constructed according to the design presented in this report. I understand that the City of Fort Lupton does not and will not assume liability for drainage facilities designed and/or certified by my engineer. I understand that the City of Fort Lupton reviews drainage plans but cannot, on behalf of GEP Investments, LLC and/or their successors and/or assigns assume future liability for improper design. I am also aware of the provisions of the City CODE as it pertains to the City's review.


By: George Eidsness
Title: *President*

2-16-21
Date

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I. GENERAL LOCATION AND DESCRIPTION

1

A. Location

The subject site is located in the northeast part of the SW1/4, SE1/4, Section 17, Township 1 North, Range 66 West, City of Fort Lupton, County of Weld, State of Colorado.

This site is bounded on the west by TRANSWEST TRAILER MANUFACTURING FACILITY, the Phase 2 development, on the north by a farmer's field and residence, on the east by a private drive and farm properties on the other side of the private drive and on the south by SUMMIT BODY WORKS, the Phase 1 development. This site is located, at present, in the northeast part of Lot 2, TRANSWEST NORTH MINOR SUBDIVISION. It is proposed to replat this property so that it will be located within Lot 1.

B. Site Description

The subject property's features are described as follows:

Property Area: The subject property is presently located in that part of Lot 2, TRANSWEST NORTH MINOR SUBDIVISION lying north of Lot 1 and contains 287,628 sq ft or 6.603 acres.

Vegetation: The subject property has been used for farming in the past and there is no significant vegetation.

Topography: The site drains westerly with a typical slope that varies from 2 to 3 percent.

Soil Type: According to the Geotechnical Subsurface Exploration Report (see **VII REFERENCES** for citation), the soils on this property consist of an upper soil of silty to clayey sand and an underlying layer of sandy clay. Claystone bedrock was encountered at a depth of approximately 19 feet. Groundwater was not encountered in any of the test holes. See excerpts from this report in the appendix. Based on this, the soil on this site is considered to be classified within hydrologic group C.

Major drainageways: There are no major drainageways on or adjacent to this property.

Irrigation facilities: There are irrigation ditches along the north and east property lines of this site. Old irrigation ditches located within this site, used for irrigating only this property, are abandoned.

Existing site improvements and land use: This property is presently unimproved and is vacant. In the past, this property has been used as a farmer's field.

Adjacent street improvements: The private drive located east of this property is asphalt paved. No access is proposed from this private drive. A concrete lined, combination drainage and irrigation ditch runs along the west side of the private drive.

Adjacent storm sewers: There are no public storm sewers on or adjacent to this site. There are private storm sewers located within the Phase 1 and 2 developments.

II. DRAINAGE BASINS AND SUB-BASINS

2

A. Major Basin Description

Historically, the subject site and surrounding properties have drained westerly towards the South Platte River, located approximately 1.5 miles to the west.

B. Sub-Basin Description

The subject property drains westerly by sheet flow into the retention pond for Phase 2. This pond will be slightly deepened to additional flows from the phase 1 and 3 developments.

A. Regulations

The drainage plan and calculations have been made in accordance with Fort Lupton's "Storm Drainage and Technical Criteria (see **VII. REFERENCES** for citation).

B. Relevant Flood Hazard & Drainage Studies

Since this property is presently located within Lot 2, TRANSWEST NORTH MINOR SUBDIVISION, it was included within the FINAL DRAINAGE REPORT FOR TRAILER MANUFACTURING FACILITY, designated as Phase 2, prepared by me, dated March 11, 2019. The drainage report for the adjacent development to the South, designated as Phase 1, also prepared by me, was entitled FINAL DRAINAGE REPORT FOR SUMMIT BODY WORKS, last revised August 12, 2017. This Final Drainage Report was amended twice by addendums dated September 28, 2017 and February 16, 2018.

Since there is no printed F.I.R.M. for this area, this property does not lie with any Federally identified flood hazard area.

C. Hydrological Criteria

Storm runoff rates are calculated for the 5, 10, and 100 year storm return periods.

Due to the small size of the drainage basins, the "Rational Method" has been utilized for calculation of the runoff rates (see **VIII. APPENDICES, "Equations"**).

Composite runoff coefficients, where applicable, have been calculated using values from Urban Drainage and Flood Control District's "Storm Drainage Criteria Manual" (See **VII. REFERENCES** for citation and **VIII. APPENDICES, "Storm Runoff Calculations"**).

Since the top layer of the soils on this site are somewhat clayey, for runoff purposes, the soil type for this property is classified as hydrologic group "C" (see **I. GENERAL LOCATION AND DESCRIPTION, "Site Description"**). Runoff coefficients for "clayey" type soils are used in the "Rational Method" equation for calculation of storm runoff rates from undeveloped and landscaped areas.

Storm Intensities are taken from a table prepared from the "Time Intensity Frequency Tabulation" for Fort Lupton included in the appendices (see **VIII. APPENDICES, "Storm Runoff Calculations"**).

The "times of storm concentration", for determination of the "storm intensity", are calculated using the equation contained within Urban Drainage and Flood Control District's "Storm Drainage Criteria Manual" (see **VIII. APPENDICES, "Storm Runoff Calculations"**). The "times of storm concentration" at design points are separately calculated to permit addition of all contributing drainage basins.

Since there is no suitable drainage outlet for this project, it is proposed to drain the developed portions of this site into an expanded retention pond located to the west in the Phase 2 development to provide storm runoff storage and water quality enhancement. The minimum storage volume of the proposed retention pond is calculated in accordance with the equation contained within Chapter 5 of Weld County's Engineering and Construction Criteria Manual. (see **VII REFERENCES** for citation and **VIII. APPENDICES, "Equations"**).

D. Hydraulic Criteria

Hydraulic calculations are made in accordance with equations from Fort Lupton's Storm Drainage and Technical Criteria (see **VII. REFERENCES** for citation and **VIII. APPENDICES, "Equations"**).

IV. EXISTING DRAINAGE

4

A. Tributary Basins

There is a very small tributary basin to the east that could drain onto this property during major storm events. This small amount of storm runoff will be routed around this site and, since the runoff rate is very small, calculations for this are not provided.

B. Project Site

Since runoff calculations are provided for existing drainage in the FINAL DRAINAGE REPORT FOR TRAILER MANUFACTURING FACILITY, these calculations are not provided in this report.

A. Proposed Project Description and Drainage Plan

It is proposed to construct a truck and trailer service facility with associated parking and drives on this property. Access will be by a new private drive leading South, along the West line of Lot 1 to the existing access drive from County Road 8. Since this subject site is proposed to become a part of Lot 1, an easement for this access across Lot 1 will not be required.

The drainage plan for this project is to drain all portions of this site, having impervious surfaces, internally to storm inlets. A storm sewer system will collect runoff from these inlets and will discharge the runoff into an expanded retention pond, located west of this site in Lot 2. This pond will be expanded to provide storage for runoff from the Phase 1 and 2 developments. The storm sewer system is designed to convey runoff to the pond for the 100 year storm event.

Construction of the proposed private access drive along the west line of Lot 1 will eliminate a portion of the existing retention ponds that provide storage and water quality treatment for the Phase 1 site, SUMMIT BODYWORKS. A storm inlet with pipes will allow these existing ponds, which are reduced in size, to overflow into a swale leading to the expanded retention pond located on the north portion of Lot 2. The retention pond located on the north portion of Lot 2 will be expanded to provide additional storage for that volume of storage lost due to construction of the private access drive. The overflow storm pipes are designed to convey runoff reaching the existing pond for the 100 year storm event.

Other than revisions to the retention ponds, the planned construction of this Phase 3 development will have no affects upon the existing and planned drainage facilities within the Phase 1 and 2 developments.

B. Irrigation Ditches

The only irrigation ditches that are abandoned are those that are on-site and were used for irrigation of this subject property. All of the irrigation ditches along the perimeter of the site will remain functional.

C. Tributary Basins

There is a very small tributary basin to the east that could drain onto this property during major storm events. This small amount of storm runoff will be routed around this site and, since the runoff rate is very small, calculations for this are not provided.

D. Project Site

Runoff calculations are provided for 8 on-site, developed drainage basins, designated as basins D3-1 through D3-8 and for 4 onsite, design points, designated as design points A through D. Runoff calculations are also provided for two drainage basins located in the Phase 1 development, designated as basins D1-1 and D1-2, and for 2 drainage basins, designated as basins D2-1 and D2-2 and for a single design point, designated as design point E, located in the Phase 2 development.

Basin D3-1 contains 1.33 acres and consists of the northeast portion of the truck and trailer parking area located in the east portion of the site. This basin drains northwest to a 10 foot type R inlet, which discharges via the storm sewer system into the expanded retention pond located west of the site in Lot 2. The runoff rates for this basin are calculated to be 3.83 cfs, 4.87 cfs and 8.76 cfs for the 5, 10 and 100 year storms respectively.

Basin D3-2 contains 2.13 acres and consists of the southeast portion of the truck and trailer parking area located in the east portion of the site. This basin drains southwest to a 10 foot type R inlet, which discharges via the storm sewer system into the expanded retention pond located west of the site in Lot 2. The runoff rates for this basin are calculated to be 6.01 cfs, 7.66 cfs and 13.88 cfs for the 5, 10 and 100 year storms respectively.

Basin D3-3 contains 0.16 acres and consists of the roof over the southeast corner of the building and the area directly south of the proposed building. This basin drains south in a pipe to the storm sewer, which discharges into the expanded retention pond located west of the site in Lot 2. The runoff rates for this basin are calculated to be 2.73 cfs, 3.30 cfs and 5.63 cfs for the 5, 10 and 100 year storms respectively.

Basin D3-4 contains 0.66 acres and consists of the remaining roof area of the building. This basin drains west to the roof's gutters and into downspouts to a collection pipe that discharges into the storm sewer, which discharges into the expanded retention pond located west of the site in Lot 2. The runoff rates for this basin are calculated to be 2.73 cfs, 3.30 cfs and 5.63 cfs for the 5, 10 and 100 year storms respectively.

Basin D3-5 contains 0.37 acres and consists of portions of the private drive southwest of the building. Most of this area lies within the Phase 1 development and runs along the west edge of the remaining portion of the existing retention pond for phase 1. This basin drains internally into a 5 foot type R inlet that discharges, via a short length of storm sewer, into the remaining portion of the existing retention pond in Phase 1. As this pond fills and reaches a surface elevation of 53.0, it will overflow via a weir into the south portion of the remaining portion of the Phase 1 pond. Upon reaching a surface elevation of 56.2, the pond will overflow into a modified type D inlet that drains, via two 36 inch storm sewer pipes to a riprap lined swale that discharges into the expanded retention pond in Lot 2. The runoff rates for this basin are calculated to be 1.65 cfs, 2.20 cfs and 3.25 cfs for the 5, 10 and 100 year storms respectively.

Basin D3-6 contains 0.80 acres and consists of the automobile parking and drive area west of the building. This basin drains west to a 5 foot type R inlet, which discharges via a short length of storm sewer system into a riprap lined swale leading to the expanded retention pond located west of the site in Lot 2. The runoff rates for this basin are calculated to be 3.62 cfs, 4.37 cfs and 7.08 cfs for the 5, 10 and 100 year storms respectively.

Basin D3-7 contains 0.59 acres and consists of undeveloped and sloped areas, along the new west line of Lot 1, lying west of the automobile parking and drive area. This basin drains west by sheet flow into the expanded retention pond located west of the site in Lot 2. The runoff rates for this basin are calculated to be 0.04 cfs, 0.37 cfs and 1.92 cfs for the 5, 10 and 100 year storms respectively.

Basin D3-8 contains 0.26 acres and consists of the south portion of the private drive running along the west edge of the remaining portion of the existing retention pond for phase 1. This basin drains internally into a 5 foot type R inlet that discharges, via a short length of storm sewer, into the remaining portion of the existing retention pond in Phase 1. As this pond fills and reaches a surface elevation of 53.0, it will overflow via a weir into the north portion of the remaining portion of the Phase 1 pond. Upon reaching a surface elevation of 56.2, the pond will overflow into a modified type D inlet that drains, via two 36 inch storm sewer pipes to a riprap lined swale that discharges into the expanded retention pond in Lot 2. The runoff rates for this basin are calculated to be 1.19 cfs, 1.44 cfs and 2.32 cfs for the 5, 10 and 100 year storms respectively.

Basin D1-1 contains 7.39 acres and consists of the north and east portions of the Phase 1 (Summit Body Works) development. This basin drains north and west in concrete drainage pans and storm sewers into the remaining portion of the existing retention pond in Phase 1. As this pond fills and reaches a surface elevation of 53.0, it will overflow via a weir into the south portion of the remaining portion of the Phase 1 pond. Upon reaching a surface elevation of 56.2, the pond will overflow into a modified type D inlet that drains, via two 36 inch storm sewer pipes to a riprap lined swale that discharges into the expanded retention pond in Lot 2. The runoff rates for this basin are calculated to be 23.76 cfs, 30.09 cfs and 53.76 cfs for the 5, 10 and 100 year storms respectively.

Basin D1-2 contains 6.55 acres and consists of the south and central east portions of the Phase 1 (Summit Body Works) development. The Summit Body Works' building lies in this basin. This basin drains west in swales and in various storm sewers into the remaining portion of the existing retention pond in Phase 1. As this pond fills and reaches a surface elevation of 53.0, it will overflow via a weir into the north portion of the remaining portion of the Phase 1 pond. Upon reaching a surface elevation of 56.2, the pond will overflow into a modified type D inlet that drains, via two 36 inch storm sewer pipes to a riprap lined swale that discharges into the expanded retention pond in Lot 2. The runoff rates for this basin are calculated to be 18.72 cfs, 23.30 cfs and 41.78 cfs for the 5, 10 and 100 year storms respectively.

Basin D2-1 contains 10.14 acres and consists of the entire parking, drive and building area of the Phase 2 (Transwest Trailer Manufacturing Facility) development. This basin drains into various inlets and storm sewers that all discharge into the expanded retention pond in the north portion of Lot 2. The runoff rates for this basin are calculated to be 26.98 cfs, 33.99 cfs and 61.24 cfs for the 5, 10 and 100 year storms respectively.

Basin D2-2 contains 4.16 acres and consists of expanded retention pond area in the north part of the Phase 2 (Transwest Trailer Manufacturing Facility) development. This basin drains internally in the retention pond by sheet flow. The runoff rates for this basin are calculated to be 0.41 cfs, 3.42 cfs and 18.14 cfs for the 5, 10 and 100 year storms respectively.

Design point A is located in the storm sewer pipe leading west from inlet I3-2 to inlet I3-3. This storm sewer eventually discharges into the expanded retention pond in Lot 2. Runoff from basins D3-1 and D3-2, containing a total area of 3.46 acres, contribute runoff to this design point. The purpose of this design point is for design of the storm sewer. The runoff rates at this design point are calculated to be 9.30 cfs, 11.86 cfs and 21.38 cfs for the 5, 10 and 100 year storms respectively.

Design Point B is located in the storm sewer pipe leading west from I3-3 to MH3-1. This storm sewer eventually discharges into the expanded retention pond in Lot 2. Runoff from basins D3-1, D3-2 and D3-3 containing a total area of 3.62 acres, contribute runoff to this design point. The purpose of this design point is for design of the storm sewer. The runoff rates at this design point are calculated to be 9.79 cfs, 12.45 cfs and 22.39 cfs for the 5, 10 and 100 year storms respectively.

Design Point C is located in the storm sewer pipe leading west from inlet MH3-1 to MH3-2. This storm sewer eventually discharges into the expanded retention pond in Lot 2. Runoff from basins D3-1 through D3-4, containing a total area of 4.22 acres, contribute runoff to this design point. The purpose of this design point is for design of the storm sewer. The runoff rates at this design point are calculated to be 11.92 cfs, 15.01 cfs and 26.76 cfs for the 5, 10 and 100 year storms respectively.

Design Point D is located in the north part of the remaining portion of the existing retention pond in Phase 1 at the modified type D inlet. This two 36 inch storm sewer pipes from this inlet discharge into a riprap lined swale leading into the expanded retention pond in Lot 2. Runoff from basins D1-1, D1-2, D3-5 and D3-8, containing a total area of 18.16 acres, contribute runoff to this design point. The purpose of this design point is for design of the storm inlet and storm sewer pipes. The runoff rates at this design point are calculated to be 56.11 cfs, 68.97 cfs and 120.90 cfs for the 5, 10 and 100 year storms respectively.

Design Point E is located in the expanded retention pond lying west of this site in Phase 2. Runoff from basins D3-1 through D3-8, D1-1, D1-2, D2-1 and D2-2, containing a total of 34.54 acres contribute runoff to this design point. The purpose of this design point is for design of the emergency overflow weir for this pond. The runoff rates at this design point are calculated to be 74.64 cfs, 95.72 cfs and 179.95 cfs for the 5, 10 and 100 year storms respectively.

See **VIII. APPENDICES, "Drainage Calculations"** for supporting calculations.

Water quality enhancement and retention storage for this property, and for the storage volume lost in the Phase 1 development, are provided by a single expanded retention pond located in the north portion of Lot 2 in the Phase 2 development. The minimum storage volume of this expanded retention pond is calculated in accordance with the equation contained within Chapter 5 of Weld County's Engineering and Construction Criteria. (see **VII REFERENCES** for citation and **VIII. APPENDICES, "Equations"**).

The minimum required volume for this expanded retention pond is based on the storage requirements for the Phase 2 development plus the storage requirements for this Phase 3 development and to provide replacement storage for the storage volume lost within the Phase 1 development due to construction of the access drive. This required storage volume is calculated to be 730,266 cubic feet, which requires a water surface elevation of 48.36 feet, at a maximum depth of 5.36 feet for the 100 year storm event. Upon reaching a water surface elevation of 49.25 feet, the pond would overflow, through the overflow weir, onto the adjacent property to the west. This emergency overflow weir has an average length of 44 feet, a maximum depth of 1.25 feet and is designed to convey 100% of the runoff rate reaching the pond for the 100 year storm event. The top of the berm surrounding this pond has a minimum elevation of 50.50 feet. The pond's side slopes are at 4:1.

(See **VIII. APPENDICES, "Retention Pond Calculations"** for supporting calculations.)

F. Storm Sewers and Culverts

The drainage plan for this project is to drain all developed portions of this site, having impervious surfaces, internally to storm inlets. Storm sewers will collect runoff from these inlets and will discharge the runoff into the expanded retention pond located to the west in Lot 2. These storm sewers and inlets are designed to convey storm runoff to the retention pond for the 100 year storm event. The design of these storm sewers is based on the expanded retention pond to the west on Lot 2 having a depth as required for the pond to contain 50 percent of the maximum volume of water calculated for the 100 year storm event, which is greater than the volume in the pond that would occur at the time of maximum rate of flow in the storm sewers. Hydraulic grade line (HGL) calculations are provided for the storm sewer system.

Since the locations of the roof downspouts are not accurately known at this time and since it is not necessary for the roof downspout collection pipe to be designed for any specific storm event, design calculations are not provided for this collection pipe. In the event the roof gutters overflow during major storm events, the excess runoff will reach the inlet located on the west side of the parking area and will be discharged into the expanded retention pond to the west.

There are no proposed culverts for this development.

See **VIII. APPENDICES, "Storm Sewer Design"** for supporting calculations.

CONCLUSIONS

9

A. Compliance with Standards

It is believed that this report conforms with the Storm Drainage and Technical Criteria of Fort Lupton.

B. Impact on Surrounding Areas

Construction of the expanded retention pond will reduce the runoff rates onto the adjacent property to the west to much less than what the existing runoff rates are.

This development of this property as planned will not have any significant, adverse, drainage impact on surrounding properties.

Construction of the expanded retention pond will also provide water quality enhancement for this project.

VII. REFERENCES

10

Urban Drainage and Flood Control District's "Urban Storm Drainage Criteria Manual", last revised January, 2016.

City of Fort Lupton's "Storm Drainage and Technical Criteria".

Chapter 5, Weld County's "Engineering and Construction Criteria", dated April, 2012.

Subsurface Soil Investigation for Transwest, Phase 3, 13525 County Road 8, Fort Lupton, Colorado by Rocky Mountain Group, dated March 16, 2020, job no. 175226.

Final Drainage Report for Trailer Manufacturing Facility, by Edgar Jennings, dated March 11.

Final Drainage Report for Summit Body Works, by Edgar Jennings, last revised August 12, 2017.

First Amendment to Final Drainage Report for Summit Body Works, by Edgar Jennings, last revised September 28, 2017.

Second Amendment to Final Drainage Report for Summit Body Works, by Edgar Jennings, last revised February 16, 2018.

Equations**Storm Water Runoff ("Rational" Method)**

$$Q = CIA$$

Q = runoff rate (cfs)

C = runoff coefficient

I = storm intensity (in/hr)

A = drainage basin area (ac)

Time of Concentration (for determination of t)

$$T = T_i + T_t = 0.395(1.1 - C_5) L^{1/2} / S^{1/3} + L' / 60 v$$

Max T = (L + L') / 180 + 10, for urban development conditions

Max T = 45, for historic undeveloped conditions

Max L = 300 ft

T = time of concentration (min)

T_i = initial or overland flow time (min)

T_t = travel or channel flow time (min)

C₅ = runoff coefficient for 5 year storm

L = overland flow length (ft), 300 foot max

S = overland flow slope (%)

L' = channel flow length (ft)

v = ave velocity of channel flow (fps)

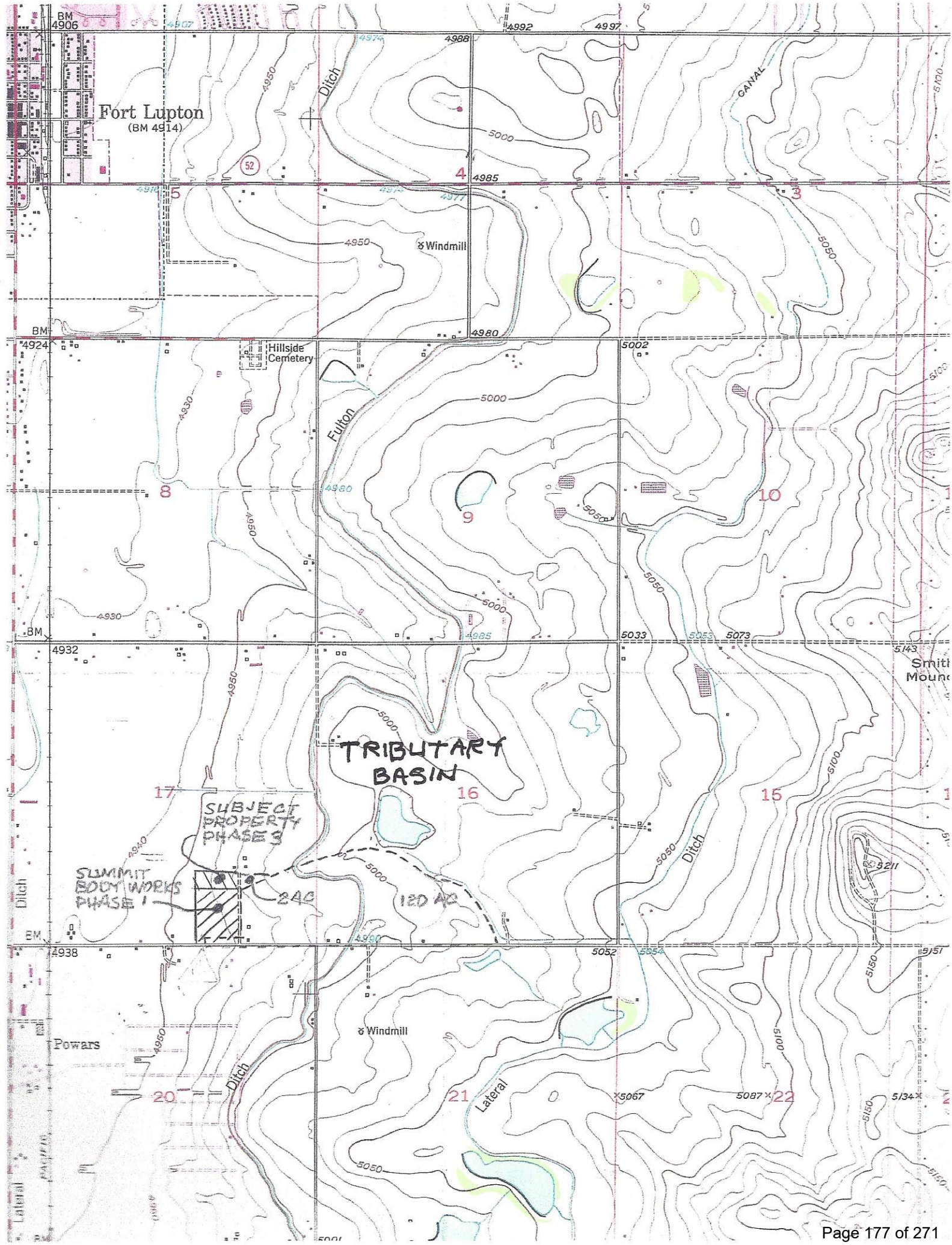
Minimum Storm Retention Pond Volume

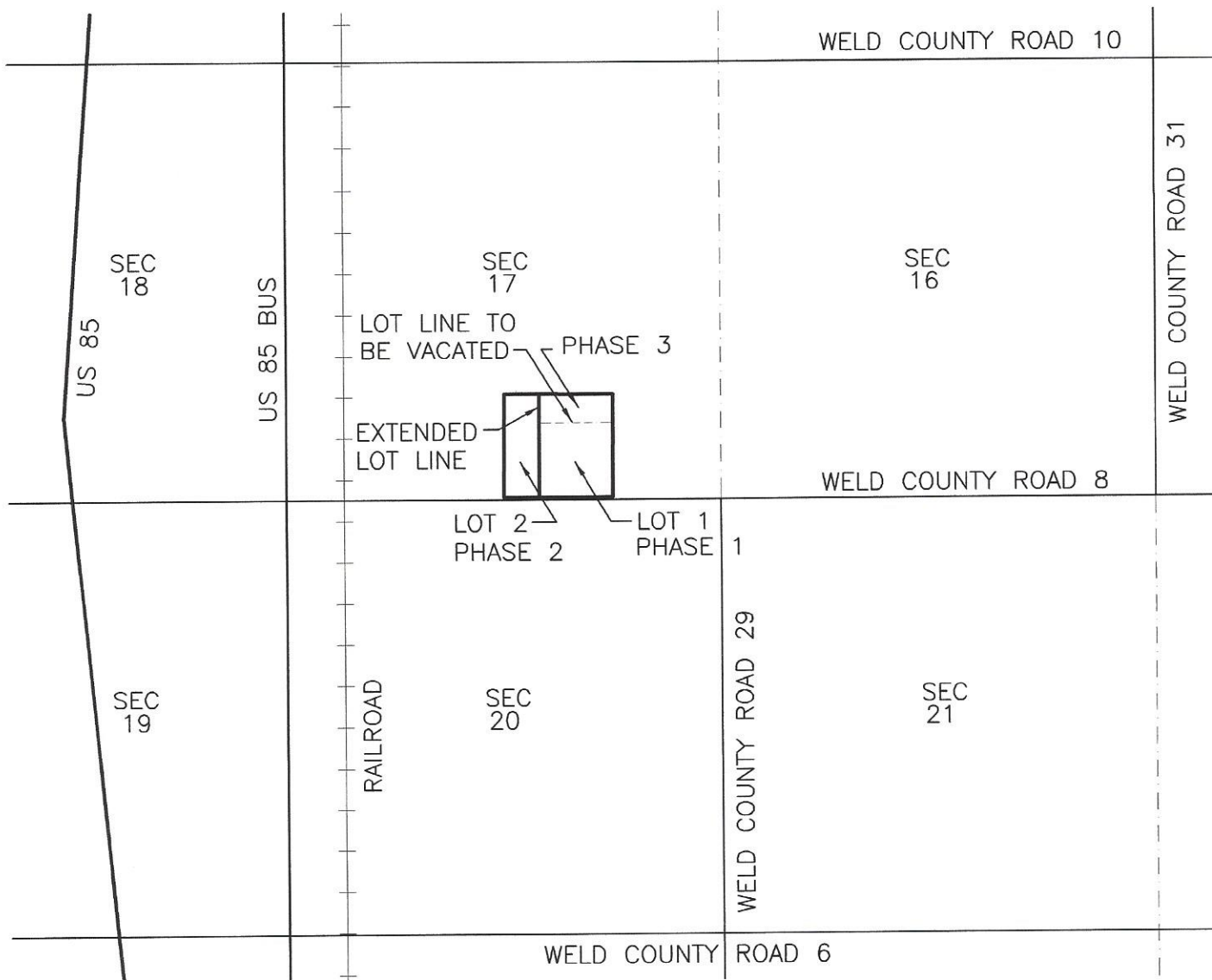
$$V = 1.5 \times (d/12) \times A \times 43560$$

V = minimum required volume (cu ft)

d = 24 hr 100 year rainfall depth (in)

A = basin area (ac)

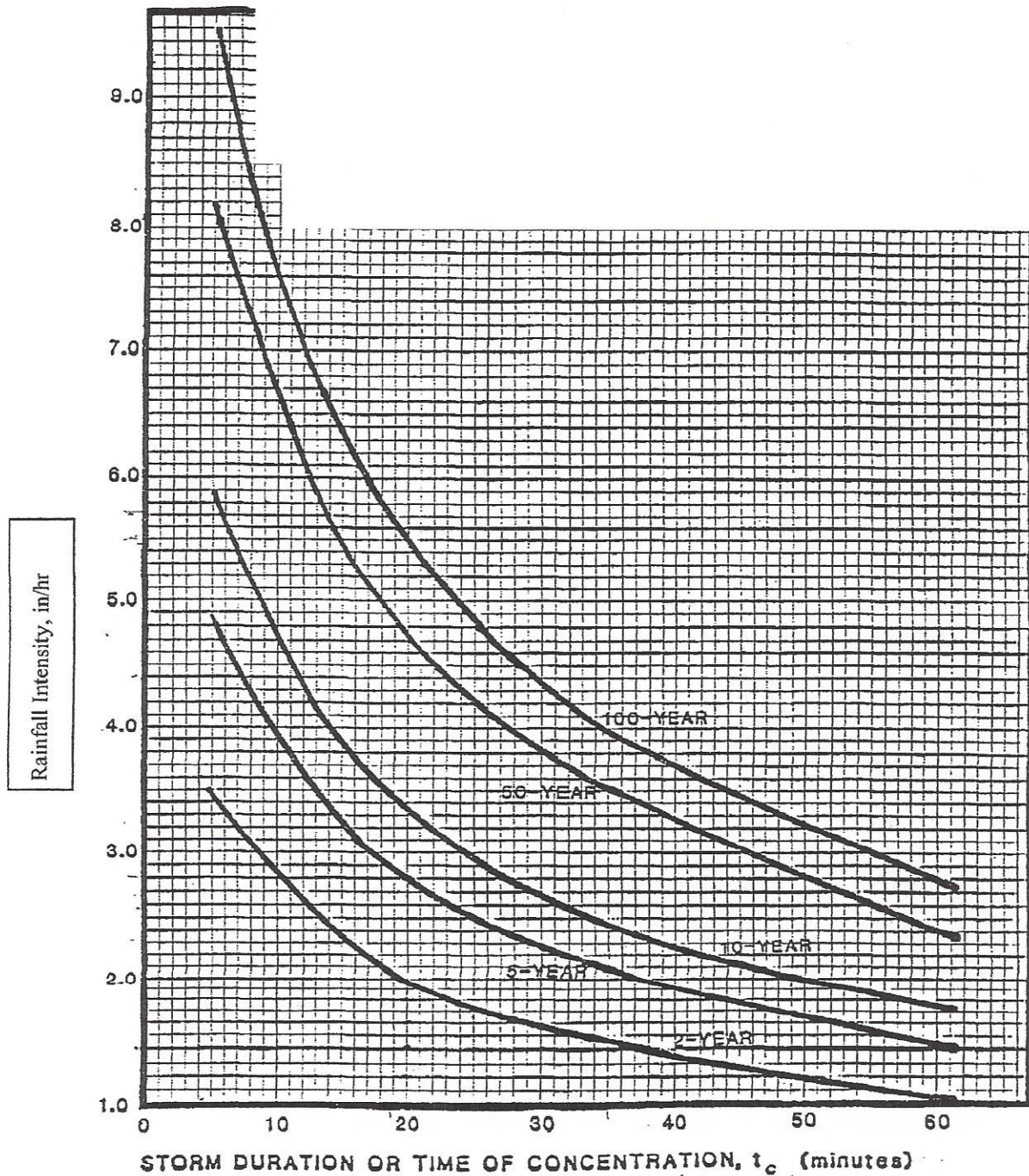




VICINITY MAP
1"=2000'

STORM RUNOFF CALCULATIONS

Figure 501
Time-Intensity-Frequency Curves
for the Rational Method



Reference: WRC Engineering, Inc. TM-1, November 1986

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

RAINFALL INTENSITIES "I" FOR ADAMS COUNTY:***STORM INTENSITIES ("I")***

Time min	5 yr in/hr	10 yr in/hr	100 yr in/hr	Time min	5 yr in/hr	10 yr in/hr	100 yr in/hr
5	4.92	5.88	9.48	31	2.20	2.61	4.21
6	4.70	5.62	9.05	32	2.16	2.57	4.14
7	4.49	5.35	8.62	33	2.13	2.52	4.07
8	4.27	5.09	8.18	34	2.09	2.47	4.00
9	4.06	4.82	7.75	35	2.05	2.43	3.93
10	3.84	4.56	7.32	36	2.01	2.38	3.86
11	3.72	4.42	7.09	37	1.97	2.33	3.79
12	3.60	4.27	6.86	38	1.94	2.28	3.72
13	3.48	4.13	6.62	39	1.90	2.24	3.65
14	3.36	3.98	6.39	40	1.86	2.19	3.58
15	3.24	3.84	6.16	41	1.83	2.16	3.53
16	3.14	3.73	5.98	42	1.81	2.13	3.48
17	3.04	3.62	5.80	43	1.78	2.11	3.44
18	2.94	3.50	5.63	44	1.75	2.08	3.39
19	2.84	3.39	5.45	45	1.73	2.05	3.34
20	2.74	3.28	5.27	46	1.70	2.02	3.29
21	2.68	3.20	5.15	47	1.67	1.99	3.24
22	2.62	3.11	5.03	48	1.64	1.97	3.20
23	2.56	3.03	4.92	49	1.62	1.94	3.15
24	2.50	2.94	4.80	50	1.59	1.91	3.10
25	2.44	2.86	4.68	51	1.57	1.89	3.06
26	2.40	2.82	4.60	52	1.56	1.86	3.02
27	2.36	2.78	4.52	53	1.54	1.84	2.98
28	2.32	2.74	4.44	54	1.52	1.82	2.94
29	2.28	2.70	4.36	55	1.51	1.80	2.91
30	2.24	2.66	4.28	56	1.49	1.77	2.87
				57	1.47	1.75	2.83
				58	1.45	1.73	2.79
				59	1.44	1.70	2.75
				60	1.42	1.68	2.71

Note: Intensities developed from Table 502 of Ft.
Lupton's Storm Drainage Design and Technical
Criteria Manual.

PERCENT IMPERVIOUSNESS AND RUNOFF COEFFICIENTS (TYPE C & D SOILS):

Land Use or Surface Characteristics	Percent Impervious	2	5	10	100
Business:					
Downtown	95	0.85	0.88	0.90	0.94
Suburban	75	0.67	0.70	0.76	0.85
Residential:					
Single-Family:					
2.5 ac or larger	12	0.11	0.16	0.33	0.59
0.75 ac to 2.5 ac	20	0.18	0.23	0.35	0.60
0.25 ac to 0.75 ac	30	0.27	0.31	0.42	0.64
0.25 ac or less	45	0.40	0.44	0.53	0.71
Apartments:					
Apartments	75	0.67	0.70	0.76	0.85
Industrial:					
Light Areas	80	0.71	0.75	0.79	0.87
Heavy Areas	90	0.80	0.83	0.87	0.91
Parks & Cemeteries:	10	0.09	0.14	0.27	0.55
Playgrounds:	25	0.22	0.27	0.39	0.62
Schools:	55	0.49	0.53	0.61	0.76
Railroad Yards:	50	0.45	0.49	0.57	0.73
Undeveloped Areas:					
Historic Flows, Sandy Soils	2	NA	NA	NA	NA
Historic Flows, Clayey Soils	2	0.02	0.07	0.22	0.52
Offsite Flows (Undefined Land Use)	45	0.40	0.44	0.53	0.71
Streets:					
Paved	100	0.89	0.92	0.94	0.96
Packed Gravel	40	0.36	0.40	0.50	0.69
Drives & Walks:	90	0.80	0.83	0.87	0.91
Roofs:	90	0.80	0.83	0.87	0.91
Lawns:					
Sandy Soil	2	NA	NA	NA	NA
Clayey Soil	2	0.02	0.07	0.22	0.52

Prepared from Urban Drainage & Flood Control District's "Urban Storm Drainage Criteria Manual, Volume 1", revised January 2016.

COMPOSITE RUNOFF COEFFICIENT "C" CALCULATIONS:

Equation: $C = (C1A1 + C2A2 + \dots)/(A1 + A2 + \dots)$

Basin or Des Pt	Ground Coverage	Area (ac)	C 5 yr	C 10 yr	C 100 yr
DEVELOPED BASINS:					
D3-1	Pavement	0.24	0.930	0.940	0.940
	Recycled Asphalt	1.09	0.660	0.720	0.830
	Roof	0.00	0.840	0.850	0.900
	Landscape	0.00	0.020	0.140	0.460

TOTAL		1.33	0.709	0.760	0.850
D3-2	Pavement	0.44	0.930	0.940	0.940
	Recycled Asphalt	1.62	0.660	0.720	0.830
	Roof	0.00	0.840	0.850	0.900
	Landscape	0.07	0.020	0.140	0.460

TOTAL		2.13	0.695	0.746	0.841
D3-3	Pavement	0.10	0.930	0.940	0.940
	Recycled Asphalt	0.00	0.660	0.720	0.830
	Roof	0.04	0.840	0.850	0.900
	Landscape	0.02	0.020	0.140	0.460

TOTAL		0.16	0.794	0.818	0.870
D3-4	Pavement	0.00	0.930	0.940	0.940
	Recycled Asphalt	0.00	0.660	0.720	0.830
	Roof	0.66	0.840	0.850	0.900
	Landscape	0.00	0.020	0.140	0.460

TOTAL		0.66	0.840	0.850	0.900
D3-5	Pavement	0.36	0.930	0.940	0.940
	Recycled Asphalt	0.00	0.660	0.720	0.830
	Roof	0.00	0.840	0.850	0.900
	Landscape	0.01	0.020	0.140	0.460

TOTAL		0.37	0.905	0.918	0.927

COMPOSITE RUNOFF COEFFICIENT "C" CALCULATIONS (Con't):

Basin or Des Pt	Ground Coverage	Area (ac)	C 5 yr	C 10 yr	C 100 yr
D3-6	Pavement	0.79	0.930	0.940	0.940
	Recycled Asphalt	0.00	0.660	0.720	0.830
	Roof	0.00	0.840	0.850	0.900
	Landscape	0.01	0.020	0.140	0.460

TOTAL		0.80	0.919	0.930	0.934
D3-7	Pavement	0.00	0.930	0.940	0.940
	Recycled Asphalt	0.00	0.660	0.720	0.830
	Roof	0.00	0.840	0.850	0.900
	Landscape	0.59	0.020	0.140	0.460

TOTAL		0.59	0.020	0.140	0.460
D3-8	Pavement	0.26	0.930	0.940	0.940
	Recycled Asphalt	0.00	0.660	0.720	0.830
	Roof	0.00	0.840	0.850	0.900
	Landscape	0.00	0.020	0.140	0.460

TOTAL		0.26	0.930	0.940	0.940
D1-1	Pavement	2.97	0.930	0.940	0.940
	Recycled Asphalt	3.81	0.660	0.720	0.830
	Roof	0.00	0.840	0.850	0.900
	Landscape	0.61	0.020	0.140	0.460

TOTAL		7.39	0.716	0.761	0.844
D1-2	Pavement	3.29	0.930	0.940	0.940
	Recycled Asphalt	0.00	0.660	0.720	0.830
	Roof	1.81	0.840	0.850	0.900
	Landscape	1.45	0.020	0.140	0.460

TOTAL		6.55	0.704	0.738	0.823
D2-1	Pavement	3.90	0.930	0.940	0.940
	Recycled Asphalt	2.79	0.660	0.720	0.830
	Roof	1.82	0.840	0.850	0.900
	Landscape	1.63	0.020	0.140	0.460

TOTAL		10.14	0.693	0.735	0.825

COMPOSITE RUNOFF COEFFICIENT "C" CALCULATIONS (Con't):

Basin or Des Pt	Ground Coverage	Area (ac)	C 5 yr	C 10 yr	C 100 yr
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DESIGN POINTS (DEVELOPED CONDITIONS):

A	D3-1	1.33	0.709	0.760	0.850
	D3-2	2.13	0.695	0.746	0.841

TOTAL		3.46	0.700	0.752	0.844
B	D3-1	1.33	0.709	0.760	0.850
	D3-2	2.13	0.695	0.746	0.841
	D3-3	0.16	0.794	0.818	0.870

TOTAL		3.62	0.704	0.754	0.845
C	D3-1	1.33	0.709	0.760	0.850
	D3-2	2.13	0.695	0.746	0.841
	D3-3	0.16	0.794	0.818	0.870
	D3-4	0.66	0.840	0.850	0.900

TOTAL		4.28	0.725	0.769	0.854
D	D3-5	0.37	0.905	0.918	0.927
	D3-8	0.26	0.930	0.940	0.940
	D1-1	7.39	0.840	0.850	0.900
	D2-1	10.14	0.693	0.735	0.825

TOTAL		18.16	0.761	0.788	0.859
E	D3-1	1.33	0.709	0.760	0.850
	D3-2	2.13	0.695	0.746	0.841
	D3-3	0.16	0.794	0.818	0.870
	D3-4	0.66	0.840	0.850	0.900
	D3-5	0.37	0.905	0.918	0.927
	D3-6	0.80	0.919	0.930	0.934
	D3-7	0.59	0.020	0.140	0.460
	D3-8	0.26	0.930	0.940	0.940
	D1-1	7.39	0.716	0.761	0.844
	D1-2	6.55	0.704	0.738	0.823
	D2-1	10.14	0.693	0.735	0.825
	D2-2	4.16	0.020	0.140	0.460

TOTAL		34.54	0.621	0.671	0.787

COMPOSITE RUNOFF COEFFICIENT "C" CALCULATIONS (Con't):

Basin or Des Pt	Ground Coverage	Area (ac)	C 5 yr	C 10 yr	C 100 yr
D2-2	Pavement	0.00	0.930	0.940	0.940
	Recycled Asphalt	0.00	0.660	0.720	0.830
	Roof	0.00	0.840	0.850	0.900
	Landscape	4.16	0.020	0.140	0.460

TOTAL		4.16	0.020	0.140	0.460

TIME OF CONCENTRATION "Tc" CALCULATIONS:

$$\text{Equations: } T_c = T_i + T_t = 0.395(1.1 - C_5)L^{1/2}/S^{1/3} + (L'/60)C_v S_w^{1/2}$$

Where: max $T_c = (L + L')/180 + 10$ for urban conditions
 max $T_c = 45$ for historic undeveloped conditions
 max $L = 500$ ft for rural land use
 max $L = 300$ ft for urban land use

Conveyance Coefficient C_v	
Land Surface	C_v
Heavy meadow	2.5
Tillage/field	5
Short pasture & lawns	7
Nearly bare ground	10
Grassed waterway	15
Paved areas shallow swales	20

Basin or Des Pt	L ft	Ti calcs		Ti min	L' ft	Sw %	Tt calcs		Tt min	max Tc min	Tc min
		C5	slope %				Cv	v ft/sec			
D3-1	300	0.71	3.0	8.6	80	3.0	20	13.4	0.1	13	9
					70	0.8	20	3.6	0.3		
D3-2	300	0.70	3.2	8.6	60	3.2	20	14.3	0.1	13	9
					105	0.8	20	3.6	0.5		
D3-3	70	0.79	1.2	4.5						10	5
D3-4	100	0.84	2.1	3.7	45	2.0	20	8.9	0.1	11	5
D3-5	37	0.91	1.6	1.8	290	1.3	20	5.8	0.8	12	5
D3-6	120	0.92	2.1	2.8	130	0.8	20	3.6	0.6	11	5
D3-7	145	0.02	11.1	10.7						11	11
D3-8	35	0.93	2.1	1.4	200	1.0	20	4.5	0.7	11	5
D1-1											7
D1-2											9
D2-1											10
D2-2											5

FROM PHASE 1 DRAINAGE STUDY

FROM PHASE 1 DRAINAGE STUDY

FROM PHASE 2 DRAINAGE STUDY

USE MIN VALUE

TIME OF CONCENTRATION "Tc" CALCULATIONS (Con't):

Basin or Des Pt	L ft	Ti calcs		Ti min	L' ft	Sw %	Tt calcs		Tt min	max Tc min	Tc min
		C5	slope %				Cv	v ft/sec			

DESIGN POINTS FOR STORM SEWER DESIGN (DEVELOPED CONDITIONS):

A	300	0.70	3.0	8.8	80	3.0	20	13.4	0.1	14	10
					70	0.8	20	3.6	0.3		
					338			5.3	1.1		
B	300	0.70	3.1	8.7	80	3.0	20	13.4	0.1	14	10
					70	0.8	20	3.6	0.3		
					338			5.3	1.1		
					148			7.2	0.3		
C	300	0.73	3.1	8.1	80	3.0	20	13.4	0.1	16	10
					70	0.8	20	3.6	0.3		
					338			5.3	1.1		
					148			7.2	0.3		
					83			7.5	0.2		

DESIGN POINTS FOR PHASE 1 OVERFLOW PIPE AND PHASE 2 OVERFLOW WEIR:

D	FROM PHASE 1 DRAINAGE STUDY										9
E	300	0.62	3.1	10.5	80	3.0	20	13.4	0.1	17	13
					70	0.8	20	3.6	0.3		
					338			5.3	1.1		
					148			7.2	0.3		
					83			7.5	0.2		
					132			6.1	0.4		
					76			6.1	0.2		

RUNOFF "Q" CALCULATIONS:Equation: $Q = CIA$ **5 YEAR STORM**

Basin or Design Point	A ac	T min	"C"	I in/hr	Q cfs
D3-1	1.33	9	0.709	4.06	3.83
D3-2	2.13	9	0.695	4.06	6.01
D3-3	0.16	5	0.794	4.92	0.63
D3-4	0.66	5	0.840	4.92	2.73
D3-5	0.37	5	0.905	4.92	1.65
D3-6	0.80	5	0.919	4.92	3.62
D3-7	0.59	11	0.020	3.72	0.04
D3-8	0.26	5	0.930	4.92	1.19
D1-1	7.39	7	0.716	4.49	23.76
D1-2	6.55	9	0.704	4.06	18.72
D2-1	10.14	10	0.693	3.84	26.98
D2-2	4.16	5	0.020	4.92	0.41

DESIGN POINTS (DEVELOPED CONDITIONS):

A	3.46	10	0.700	3.84	9.30
B	3.62	10	0.704	3.84	9.79
C	4.28	10	0.725	3.84	11.92
D	18.16	9	0.761	4.06	56.11
E	34.54	13	0.621	3.48	74.64

RUNOFF "Q" CALCULATIONS (Con't):**10 YEAR STORM**

Basin or Design Point	A ac	T min	"C"	I in/hr	Q cfs
D3-1	1.33	9	0.760	4.82	4.87
D3-2	2.13	9	0.746	4.82	7.66
D3-3	0.16	5	0.818	5.88	0.77
D3-4	0.66	5	0.850	5.88	3.30
D3-5	0.37	5	0.918	5.88	2.00
D3-6	0.80	5	0.930	5.88	4.37
D3-7	0.59	11	0.140	4.42	0.37
D3-8	0.26	5	0.940	5.88	1.44
D1-1	7.39	7	0.761	5.35	30.09
D1-2	6.55	9	0.738	4.82	23.30
D2-1	10.14	10	0.735	4.56	33.99
D2-2	4.16	5	0.140	5.88	3.42

DESIGN POINTS (DEVELOPED CONDITIONS):

A	3.46	10	0.752	4.56	11.86
B	3.62	10	0.754	4.56	12.45
C	4.28	10	0.769	4.56	15.01
D	18.16	9	0.788	4.82	68.97
E	34.54	13	0.671	4.13	95.72

RUNOFF "Q" CALCULATIONS (Con't):**100 YEAR STORM**

Basin or Design Point	A ac	T min	"C"	I in/hr	Q cfs
DEVELOPED BASINS (DEVELOPED CONDITIONS):					
D3-1	1.33	9	0.850	7.75	8.76
D3-2	2.13	9	0.841	7.75	13.88
D3-3	0.16	5	0.870	9.48	1.32
D3-4	0.66	5	0.900	9.48	5.63
D3-5	0.37	5	0.927	9.48	3.25
D3-6	0.80	5	0.934	9.48	7.08
D3-7	0.59	11	0.460	7.09	1.92
D3-8	0.26	5	0.940	9.48	2.32
D1-1	7.39	7	0.844	8.62	53.76
D1-2	6.55	9	0.823	7.75	41.78
D2-1	10.14	10	0.825	7.32	61.24
D2-2	4.16	5	0.460	9.48	18.14
DESIGN POINTS (DEVELOPED CONDITIONS):					
A	3.46	10	0.844	7.32	21.38
B	3.62	10	0.845	7.32	22.39
C	4.28	10	0.854	7.32	26.76
D	18.16	9	0.859	7.75	120.90
E	34.54	13	0.787	6.62	179.95

STORM RUNOFF SUMMARY TABLE														
BASIN OR DESIGN POINT		5 Year Storm			10 Year Storm			100 Year Storm						
		A ac	T min	C	I in/hr	Q cfs	C	I in/hr	Q cfs	C	I in/hr	Q cfs		
DEVELOPED BASINS (DEVELOPED CONDITIONS):														
D3-1		1.33	9	0.709	4.06	3.83	0.760	4.82	4.87	0.850	7.75	8.76		
D3-2		2.13	9	0.695	4.06	6.01	0.746	4.82	7.66	0.841	7.75	13.88		
D3-3		0.16	5	0.794	4.92	0.63	0.818	5.88	0.77	0.870	9.48	1.32		
D3-4		0.66	5	0.840	4.92	2.73	0.850	5.88	3.30	0.900	9.48	5.63		
D3-5		0.37	5	0.905	4.92	1.65	0.918	5.88	2.20	0.927	9.48	3.25		
D3-6		0.80	5	0.919	4.92	3.62	0.930	5.88	4.37	0.934	9.48	7.08		
D3-7		0.59	11	0.020	3.72	0.04	0.140	4.42	0.37	0.460	7.09	1.92		
D3-8		0.26	5	0.930	4.92	1.19	0.940	5.88	1.44	0.940	9.48	2.32		
D1-1		7.39	7	0.716	4.49	23.76	0.761	5.35	30.09	0.844	8.62	53.76		
D1-2		6.55	9	0.704	4.06	18.72	0.738	4.82	23.30	0.823	7.75	41.78		
D2-1		10.14	10	0.693	3.84	26.98	0.735	4.56	33.99	0.825	7.32	61.24		
D2-2		4.16	5	0.020	4.92	0.41	0.140	5.88	3.42	0.460	9.48	18.14		
DESIGN POINTS (DEVELOPED CONDITIONS):														
A		3.46	10	0.700	3.84	9.30	0.752	4.56	11.86	0.844	7.32	21.38		
B		3.62	10	0.704	3.84	9.79	0.754	4.56	12.45	0.845	7.32	22.39		
C		4.22	10	0.725	3.84	11.92	0.769	4.56	15.01	0.854	7.32	26.76		
D		18.16	9	0.761	4.06	56.11	0.788	4.82	68.97	0.859	7.75	120.90		
E		34.54	13	0.621	3.72	74.64	0.671	4.42	95.72	0.787	7.09	178.95		

STORM SEWER CALCULATIONS

CIRCULAR PIPE STORM SEWER CAPACITY CALCULATIONS:

2/3 1/2

Equation: $Q = (1.486/n)AR^2 S$

Location	Length ft	n	dia in	A sq ft	S ft/ft	Basin/ Design Point	Q (100 yr) cfs	Q (capacity) cfs	V (full) ft/sec
I3-1 TO I3-2	338	0.013	18	1.7671	0.0080	D3-1	8.76	9.40	5.3
I3-2 TO I3-3	148	0.013	24	3.1416	0.0101	A	21.38	22.74	7.2
I3-3 TO MH3-1	83	0.013	24	3.1416	0.0108	B	22.39	23.51	7.5
ROOF DRAIN TO MH3-1	309	0.013	12	0.7854	0.0120 (max)	D3-4	5.63	3.90	5.0
MH3-1 TO MH3-2	132	0.013	30	4.9087	0.0053	C	26.76	29.86	6.1
MH3-2 TO DAYLIGHT	76	0.013	30	4.9087	0.0053	C	26.76	29.86	6.1
I3-4 to DAYLIGHT	54	0.013	15	1.2272	0.0263	D3-6	7.08	10.48	8.5
I3-5 to DAYLIGHT	35	0.013	15	1.2272	0.1140	D3-5	3.25	21.81	17.8
I3-6 to DAYLIGHT	35	0.013	15	1.2272	0.1140	D3-8	2.32	21.81	17.8
I3-7 to DAYLIGHT	108	0.013	36 (2 pipes)	7.0686	0.0083	D	120.90	121.53	17.2

TYPE R SUMP INLET ENTRANCE CAPACITY CALCULATIONS:

$$\text{Equation: } Q = CA(2gH)^{1/2}$$

where: H = depth - opening height/2

g = 32.2 ft/sec/sec

c = 0.62

Basin or Design Point	Inlet	Length ft	Opening Height ft	flowline depression ft	A sq ft	depth ft	H ft	Q (100 yr) cfs	v ft/sec
D3-1	I3-1	10.00	0.50	0.25	5.00	0.75	0.50	17.59	3.5
17.59 cfs > 8.76 cfs OK									
D3-2	I3-2	10.00	0.50	0.25	5.00	0.75	0.50	17.59	3.5
17.56 cfs > 13.88 cfs OK									
D3-3	I3-3	5.00	0.50	0.25	2.50	0.75	0.50	8.80	3.5
8.80 cfs > 1.32 cfs OK									
D3-6	I3-4	5.00	0.50	0.25	2.50	0.75	0.50	8.80	3.5
8.80 cfs > 7.08 cfs OK									
D3-5	I3-5	5.00	0.50	0.25	2.50	0.75	0.50	8.80	3.5
8.80 cfs > 3.25 cfs OK									
D3-8	I3-6	5.00	0.50	0.25	2.50	0.75	0.50	8.80	3.5
8.80 cfs > 2.32 cfs OK									

CIRCULAR PIPE ORIFICE CAPACITY CALCULATIONS:

$$\text{Equation: } Q = CA(2gH)^{1/2}$$

$$\text{where: } H = \text{depth} - \text{dia}/2$$

$$g = 32.2 \text{ ft/sec/sec}$$

Basin or Design Point	Inlet	C	Dia in	A sq ft	depth ft	H ft	Q cfs cfs	v ft/sec
D	I3-6	0.62	36.0 (2 pipes)	7.069	5.80	4.30	145.86	20.6

145.86 > 120.90 OK

TYPE D SUMP INLET POND DEPTH CALCULATIONS (STANDARD GRATE):

$$\text{Equation: } Q = CA(2gH)^{1/2}$$

where: H = depth (ft)

g = 32.2 ft/sec/sec

A = opening area = $13(5.33 \text{ in} \times 41 \text{ in})/144 = 19.72 \text{ sq ft}$

Basin or Design Point	Inlet	C	A sq ft	depth ft	Q (100 yr) cfs	v ft/sec
D	I3-7	0.62	19.72	1.80	131.64	6.7

131.64 > 120.90 OK

MODIFIED TYPE D INLET POND DEPTH CALCULATIONS (STANDARD GRATE):

$$\text{Equation: } Q = CA(2gH)^{1/2}$$

where: H = depth (ft)

g = 32.2 ft/sec/sec

A = opening area = $13(5.33 \text{ in} \times 41 \text{ in})/144 = 19.72 \text{ sq ft}$

Basin or Design Point	Inlet	C	A sq ft	depth ft	Q (100 yr) cfs	v ft/sec
D	I3-7	0.62	19.72	1.80	131.64	6.7

131.64 > 120.90 OK

HGL CALCULATIONS

Culvert Calculator Report MH3-2 to DAYLIGHT

Solve For: Headwater Elevation

Culvert Summary			
Allowable HW Elevation	60.30 ft	Headwater Depth/ Height	1.18
Computed Headwater Elevation	48.75 ft	Discharge	26.76 cfs
Inlet Control HW Elev	48.66 ft	Tailwater Elevation	46.01 ft
Outlet Control HW Elev	48.75 ft	Control Type	Outlet Control
Grades			
Upstream Invert	45.80 ft	Downstream Invert	45.40 ft
Length	76.00 ft	Constructed Slope	0.005263 ft/ft
Hydraulic Profile			
Profile	M2	Depth, Downstream	1.76 ft
Slope Type	Mild	Normal Depth	1.85 ft
Flow Regime	Subcritical	Critical Depth	1.76 ft
Velocity Downstream	7.23 ft/s	Critical Slope	0.005949 ft/ft
Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	2.50 ft
Section Size	30 inch	Rise	2.50 ft
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev	48.75 ft	Upstream Velocity Head	0.73 ft
Ke	0.50	Entrance Loss	0.37 ft
Inlet Control Properties			
Inlet Control HW Elev	48.66 ft	Flow Control	Unsubmerged
Inlet Type	Square edge w/headwall	Area Full	4.9 ft ²
K	0.00980	HDS 5 Chart	1
M	2.00000	HDS 5 Scale	1
C	0.03980	Equation Form	1
Y	0.67000		

Culvert Calculator Report MH3-1 to MH3-2

Solve For: Headwater Elevation

Culvert Summary			
Allowable HW Elevation	60.30 ft	Headwater Depth/ Height	1.18
Computed Headwater Elevation	53.85 ft	Discharge	26.76 cfs
Inlet Control HW Elev	53.76 ft	Tailwater Elevation	48.75 ft
Outlet Control HW Elev	53.85 ft	Control Type	Outlet Control
Grades			
Upstream Invert	50.90 ft	Downstream Invert	50.20 ft
Length	132.00 ft	Constructed Slope	0.005303 ft/ft
Hydraulic Profile			
Profile	M2	Depth, Downstream	1.76 ft
Slope Type	Mild	Normal Depth	1.85 ft
Flow Regime	Subcritical	Critical Depth	1.76 ft
Velocity Downstream	7.23 ft/s	Critical Slope	0.005949 ft/ft
Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	2.50 ft
Section Size	30 inch	Rise	2.50 ft
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev	53.85 ft	Upstream Velocity Head	0.74 ft
Ke	0.50	Entrance Loss	0.37 ft
Inlet Control Properties			
Inlet Control HW Elev	53.76 ft	Flow Control	Unsubmerged
Inlet Type	Square edge w/headwall	Area Full	4.9 ft ²
K	0.00980	HDS 5 Chart	1
M	2.00000	HDS 5 Scale	1
C	0.03980	Equation Form	1
Y	0.67000		

Culvert Calculator Report

I3-3 to MH3-1

Solve For: Headwater Elevation

Culvert Summary			
Allowable HW Elevation	60.30 ft	Headwater Depth/ Height	1.72
Computed Headwater Elevation	55.85 ft	Discharge	22.39 cfs
Inlet Control HW Elev	55.75 ft	Tailwater Elevation	53.85 ft
Outlet Control HW Elev	55.85 ft	Control Type	Outlet Control
Grades			
Upstream Invert	52.40 ft	Downstream Invert	51.50 ft
Length	83.00 ft	Constructed Slope	0.010843 ft/ft
Hydraulic Profile			
Profile	Pressure	Depth, Downstream	2.35 ft
Slope Type	N/A	Normal Depth	1.56 ft
Flow Regime	N/A	Critical Depth	1.69 ft
Velocity Downstream	7.13 ft/s	Critical Slope	0.009329 ft/ft
Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	2.00 ft
Section Size	24 inch	Rise	2.00 ft
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev	55.85 ft	Upstream Velocity Head	0.79 ft
Ke	0.50	Entrance Loss	0.39 ft
Inlet Control Properties			
Inlet Control HW Elev	55.75 ft	Flow Control	Submerged
Inlet Type	Square edge w/headwall	Area Full	3.1 ft ²
K	0.00980	HDS 5 Chart	1
M	2.00000	HDS 5 Scale	1
C	0.03980	Equation Form	1
Y	0.67000		

Culvert Calculator Report I3-2 to I3-3

Solve For: Headwater Elevation

Culvert Summary			
Allowable HW Elevation	60.30 ft	Headwater Depth/ Height	2.18
Computed Headwater Elevation	58.25 ft	Discharge	21.38 cfs
Inlet Control HW Elev	57.07 ft	Tailwater Elevation	55.85 ft
Outlet Control HW Elev	58.25 ft	Control Type	Outlet Control
Grades			
Upstream Invert	53.90 ft	Downstream Invert	52.40 ft
Length	148.00 ft	Constructed Slope	0.010135 ft/ft
Hydraulic Profile			
Profile	Pressure	Depth, Downstream	3.45 ft
Slope Type	N/A	Normal Depth	1.54 ft
Flow Regime	N/A	Critical Depth	1.65 ft
Velocity Downstream	6.81 ft/s	Critical Slope	0.008787 ft/ft
Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	2.00 ft
Section Size	24 inch	Rise	2.00 ft
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev	58.25 ft	Upstream Velocity Head	0.72 ft
Ke	0.50	Entrance Loss	0.36 ft
Inlet Control Properties			
Inlet Control HW Elev	57.07 ft	Flow Control	Submerged
Inlet Type	Square edge w/headwall	Area Full	3.1 ft ²
K	0.00980	HDS 5 Chart	1
M	2.00000	HDS 5 Scale	1
C	0.03980	Equation Form	1
Y	0.67000		

Culvert Calculator Report

I3-1 to I3-2

Solve For: Headwater Elevation

Culvert Summary			
Allowable HW Elevation	61.20 ft	Headwater Depth/ Height	2.58
Computed Headwater Elevation	61.17 ft	Discharge	8.76 cfs
Inlet Control HW Elev	59.28 ft	Tailwater Elevation	58.25 ft
Outlet Control HW Elev	61.17 ft	Control Type	Outlet Control
Grades			
Upstream Invert	57.30 ft	Downstream Invert	54.60 ft
Length	338.00 ft	Constructed Slope	0.007988 ft/ft
Hydraulic Profile			
Profile	Pressure	Depth, Downstream	3.65 ft
Slope Type	N/A	Normal Depth	1.15 ft
Flow Regime	N/A	Critical Depth	1.15 ft
Velocity Downstream	4.96 ft/s	Critical Slope	0.008022 ft/ft
Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	1.50 ft
Section Size	18 inch	Rise	1.50 ft
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev	61.17 ft	Upstream Velocity Head	0.38 ft
Ke	0.50	Entrance Loss	0.19 ft
Inlet Control Properties			
Inlet Control HW Elev	59.28 ft	Flow Control	Submerged
Inlet Type	Square edge w/headwall	Area Full	1.8 ft ²
K	0.00980	HDS 5 Chart	1
M	2.00000	HDS 5 Scale	1
C	0.03980	Equation Form	1
Y	0.67000		

Culvert Calculator Report

I3-4 to DAYLIGHT

Solve For: Headwater Elevation

Culvert Summary			
Allowable HW Elevation	59.42 ft	Headwater Depth/ Height	1.72
Computed Headwater Elevation	56.57 ft	Discharge	7.08 cfs
Inlet Control HW Elev	56.57 ft	Tailwater Elevation	46.01 ft
Outlet Control HW Elev	56.43 ft	Control Type	Inlet Control
Grades			
Upstream Invert	54.42 ft	Downstream Invert	53.00 ft
Length	54.00 ft	Constructed Slope	0.026296 ft/ft
Hydraulic Profile			
Profile	S2	Depth, Downstream	0.77 ft
Slope Type	Steep	Normal Depth	0.75 ft
Flow Regime	Supercritical	Critical Depth	1.07 ft
Velocity Downstream	8.93 ft/s	Critical Slope	0.011270 ft/ft
Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	1.25 ft
Section Size	15 inch	Rise	1.25 ft
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev	56.43 ft	Upstream Velocity Head	0.63 ft
Ke	0.50	Entrance Loss	0.31 ft
Inlet Control Properties			
Inlet Control HW Elev	56.57 ft	Flow Control	Submerged
Inlet Type	Square edge w/headwall	Area Full	1.2 ft²
K	0.00980	HDS 5 Chart	1
M	2.00000	HDS 5 Scale	1
C	0.03980	Equation Form	1
Y	0.67000		

Culvert Calculator Report I3-5 to DAYLIGHT

Solve For: Headwater Elevation

Culvert Summary			
Allowable HW Elevation	58.00 ft	Headwater Depth/ Height	3.96
Computed Headwater Elevation	57.95 ft	Discharge	3.25 cfs
Inlet Control HW Elev	57.70 ft	Tailwater Elevation	57.70 ft
Outlet Control HW Elev	57.95 ft	Control Type	Outlet Control
Grades			
Upstream Invert	53.00 ft	Downstream Invert	49.00 ft
Length	35.00 ft	Constructed Slope	0.114286 ft/ft
Hydraulic Profile			
Profile	Pressure	Depth, Downstream	8.70 ft
Slope Type	N/A	Normal Depth	0.33 ft
Flow Regime	N/A	Critical Depth	0.73 ft
Velocity Downstream	2.65 ft/s	Critical Slope	0.006191 ft/ft
Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	1.25 ft
Section Size	15 inch	Rise	1.25 ft
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev	57.95 ft	Upstream Velocity Head	0.11 ft
Ke	0.50	Entrance Loss	0.05 ft
Inlet Control Properties			
Inlet Control HW Elev	57.70 ft	Flow Control	Unsubmerged
Inlet Type	Square edge w/headwall	Area Full	1.2 ft ²
K	0.00980	HDS 5 Chart	1
M	2.00000	HDS 5 Scale	1
C	0.03980	Equation Form	1
Y	0.67000		

Culvert Calculator Report

I3-6 to DAYLIGHT

Solve For: Headwater Elevation

Culvert Summary			
Allowable HW Elevation	58.00 ft	Headwater Depth/ Height	3.86
Computed Headwater Elevation	57.83 ft	Discharge	2.32 cfs
Inlet Control HW Elev	57.70 ft	Tailwater Elevation	57.70 ft
Outlet Control HW Elev	57.83 ft	Control Type	Outlet Control
Grades			
Upstream Invert	53.00 ft	Downstream Invert	49.00 ft
Length	35.00 ft	Constructed Slope	0.114286 ft/ft
Hydraulic Profile			
Profile	Pressure	Depth, Downstream	8.70 ft
Slope Type	N/A	Normal Depth	0.28 ft
Flow Regime	N/A	Critical Depth	0.61 ft
Velocity Downstream	1.89 ft/s	Critical Slope	0.005644 ft/ft
Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	1.25 ft
Section Size	15 inch	Rise	1.25 ft
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev	57.83 ft	Upstream Velocity Head	0.06 ft
Ke	0.50	Entrance Loss	0.03 ft
Inlet Control Properties			
Inlet Control HW Elev	57.70 ft	Flow Control	Unsubmerged
Inlet Type	Square edge w/headwall	Area Full	1.2 ft ²
K	0.00980	HDS 5 Chart	1
M	2.00000	HDS 5 Scale	1
C	0.03980	Equation Form	1
Y	0.67000		

Culvert Calculator Report

I3-7 to DAYLIGHT

Solve For: Headwater Elevation

Culvert Summary			
Allowable HW Elevation	58.00 ft	Headwater Depth/ Height	1.65
Computed Headwater Elevation	57.14 ft	Discharge	121.53 cfs
Inlet Control HW Elev	57.14 ft	Tailwater Elevation	46.01 ft
Outlet Control HW Elev	56.86 ft	Control Type	Inlet Control
Grades			
Upstream Invert	52.20 ft	Downstream Invert	51.30 ft
Length	108.00 ft	Constructed Slope	0.008333 ft/ft
Hydraulic Profile			
Profile	S2	Depth, Downstream	2.45 ft
Slope Type	Steep	Normal Depth	2.45 ft
Flow Regime	Supercritical	Critical Depth	2.52 ft
Velocity Downstream	9.82 ft/s	Critical Slope	0.007985 ft/ft
Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	3.00 ft
Section Size	36 inch	Rise	3.00 ft
Number Sections	2		
Outlet Control Properties			
Outlet Control HW Elev	56.86 ft	Upstream Velocity Head	1.43 ft
Ke	0.50	Entrance Loss	0.72 ft
Inlet Control Properties			
Inlet Control HW Elev	57.14 ft	Flow Control	Submerged
Inlet Type	Square edge w/headwall	Area Full	14.1 ft ²
K	0.00980	HDS 5 Chart	1
M	2.00000	HDS 5 Scale	1
C	0.03980	Equation Form	1
Y	0.67000		

RETENTION POND CALCULATIONS

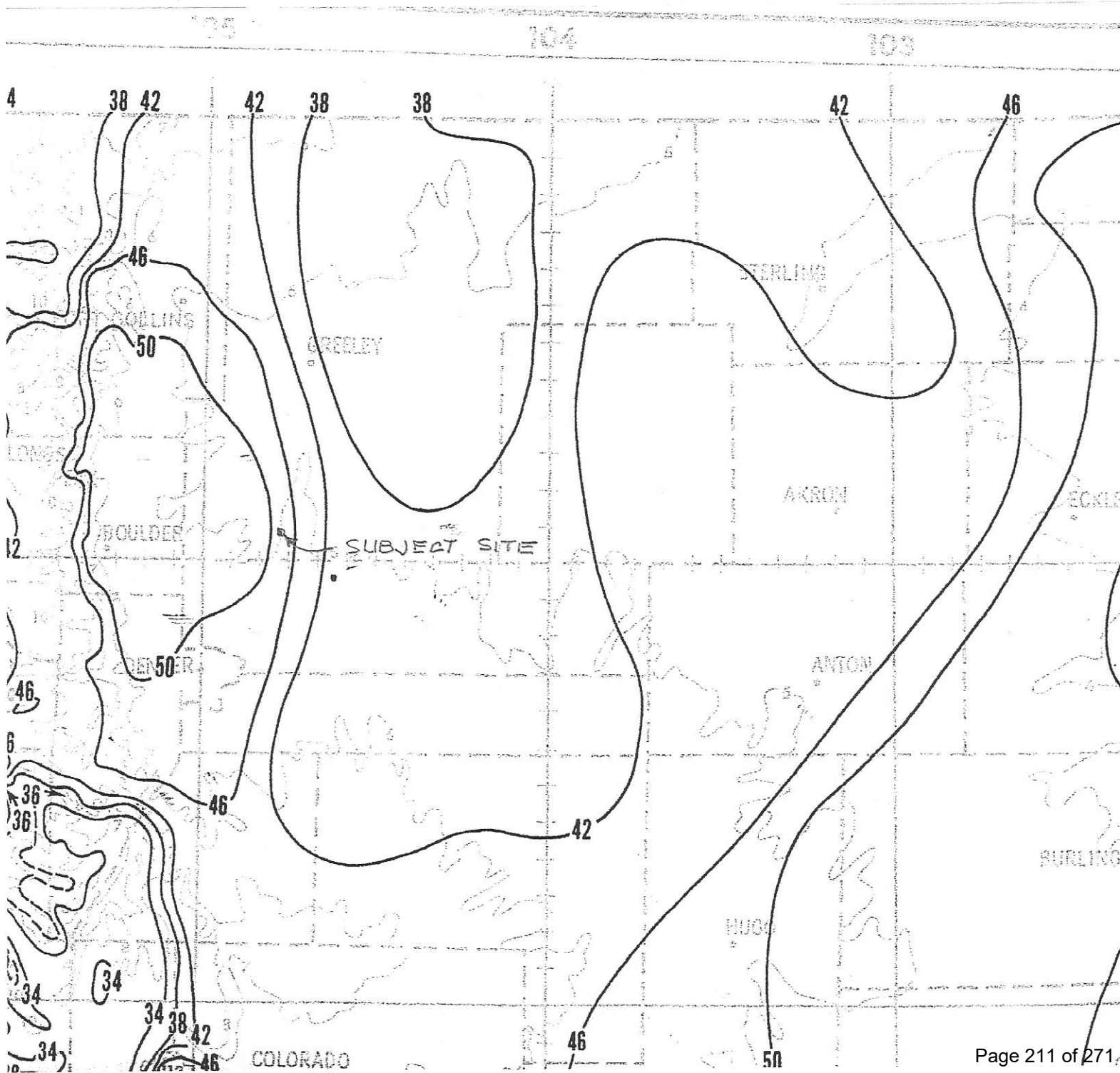
File No: NOAA

**STATE OF COLORADO'S
ISOPLUVIALS OF 100-YR 24-HR PRECIPITATION IN TENTHS OF AN INCH (EXCERPT)**

NOAA ATLAS 2, Volume III
by
U.S. Department of Commerce



scale: 1" = 21 miles



RETENTION POND DEPTH/VOLUME CALCULATIONS, PHASE 1 PONDS:

$$\text{Equation: Vol} = (d2-d1)(A2+A3+(A1 \times A2)^{1/2} / 3 + (d3-d2)(A3+A2+(A2 \times A3)^{1/2} / 3 + \dots$$

Elevation ft	Depth ft	SOUTH PORTION VOLUME CALCS				NORTH PORTION VOLUME CALCS				TOTAL VOLUME
		Surface Area sq ft	Incr Volume cu ft	Cum Volume cu ft	Depth ft	Surface Area sq ft	Incr Volume cu ft	Cum Volume cu ft		
48.00	0.00	4860	0	0	0.00	4861	0	0	0	
48.10	0.10	5199	503	503	0.10	4536	470	470	972	
48.20	0.20	5537	537	1039	0.20	4211	437	907	1946	
48.30	0.30	5876	570	1610	0.30	3887	405	1312	2922	
48.40	0.40	6214	604	2214	0.40	3562	372	1684	3898	
48.50	0.50	6553	638	2852	0.50	3237	340	2024	4876	
48.60	0.60	6891	672	3524	0.60	2912	307	2331	5855	
48.70	0.70	7230	706	4230	0.70	2587	275	2606	6836	
48.80	0.80	7568	740	4970	0.80	2263	242	2848	7818	
48.90	0.90	7907	774	5744	0.90	1938	210	3058	8802	
49.00	1.00	8245	807	6551	1.00	1613	177	3235	9786	
49.10	1.10	8587	841	7393	1.10	1697	165	3401	10793	
49.20	1.20	8930	876	8268	1.20	1781	174	3574	11843	
49.30	1.30	9272	910	9178	1.30	1865	182	3757	12935	
49.40	1.40	9615	944	10122	1.40	1949	191	3947	14070	
49.50	1.50	9957	978	11101	1.50	2033	199	4146	15247	
49.60	1.60	10299	1013	12114	1.60	2116	207	4354	16467	
49.70	1.70	10642	1047	13160	1.70	2200	216	4570	17730	
49.80	1.80	10984	1081	14242	1.80	2284	224	4794	19035	
49.90	1.90	11327	1115	15357	1.90	2368	233	5026	20383	
50.00	2.00	11669	1150	16507	2.00	2452	241	5267	21774	
50.10	2.10	11477	1157	17664	2.10	2543	250	5517	23181	
50.20	2.20	11286	1138	18802	2.20	2634	259	5776	24578	
50.30	2.30	11094	1119	19921	2.30	2726	268	6044	25965	
50.40	2.40	10903	1100	21020	2.40	2817	277	6321	27341	
50.50	2.50	10711	1081	22101	2.50	2908	286	6607	28708	
50.60	2.60	10519	1061	23162	2.60	2999	295	6902	30065	
50.70	2.70	10328	1042	24205	2.70	3090	304	7207	31412	
50.80	2.80	10136	1023	25228	2.80	3182	314	7520	32748	
50.90	2.90	9945	1004	26232	2.90	3273	323	7843	34075	
51.00	0.00	15501	-36596	-10364	3.00	3364	332	8175	-2189	

RETENTION POND DEPTH/VOLUME CALCULATIONS, PHASE 1 PONDS (Con't):

Elevation ft	SOUTH PORTION VOLUME CALCS				NORTH PORTION VOLUME CALCS				TOTAL VOLUME
	Depth ft	Surface Area sq ft	Incr Volume cu ft	Cum Volume cu ft	Depth ft	Surface Area sq ft	Incr Volume cu ft	Cum Volume cu ft	
51.10	0.10	15893	1569	-8795	3.10	3472	342	8517	-278
51.20	0.20	16285	1609	-7186	3.20	3579	353	8869	1683
51.30	0.30	16676	1648	-5538	3.30	3687	363	9232	3694
51.40	0.40	17068	1687	-3851	3.40	3795	374	9606	5755
51.50	0.50	17460	1726	-2125	3.50	3903	385	9991	7866
51.60	0.60	17852	1765	-359	3.60	4010	396	10387	10027
51.70	0.70	18244	1805	1445	3.70	4118	406	10793	12238
51.80	0.80	18635	1844	3289	3.80	4226	417	11210	14499
51.90	0.90	19027	1883	5172	3.90	4333	428	11638	16810
52.00	1.00	19419	1922	7094	4.00	4441	439	12077	19171
52.10	1.10	19878	1965	9058	4.10	4566	450	12527	21586
52.20	1.20	20337	2010	11069	4.20	4691	463	12990	24059
52.30	1.30	20795	2056	13125	4.30	4817	475	13465	26591
52.40	1.40	21254	2102	15228	4.40	4942	488	13953	29181
52.50	1.50	21713	2148	17376	4.50	5067	500	14454	31829
52.60	1.60	22172	2194	19570	4.60	5192	513	14966	34536
52.70	1.70	22631	2240	21809	4.70	5317	525	15492	37301
52.80	1.80	23089	2286	24095	4.80	5443	538	16030	40125
52.90	1.90	23548	2332	26427	4.90	5568	550	16580	43007
53.00	2.00	24007	2377	28804	5.00	5693	563	17143	45948
53.10	2.10	24475	2424	31228	5.10	5824	576	17719	48947
53.20	2.20	24944	2471	33699	5.20	5954	589	18308	52007
53.30	2.30	25412	2518	36216	5.30	6085	602	18910	55126
53.40	2.40	25881	2564	38781	5.40	6215	615	19525	58305
53.50	2.50	26349	2611	41392	5.50	6346	628	20153	61544
53.60	2.60	26817	2658	44050	5.60	6477	641	20794	64844
53.70	2.70	27286	2705	46755	5.70	6607	654	21448	68203
53.80	2.80	27754	2752	49506	5.80	6738	667	22115	71621
53.90	2.90	28223	2799	52305	5.90	6868	680	22795	75100
54.00	3.00	28691	2845	55150	6.00	6999	693	23489	78639

RETENTION POND DEPTH/VOLUME CALCULATIONS, PHASE 1 PONDS (Con't):

Elevation ft	SOUTH PORTION VOLUME CALCS					NORTH PORTION VOLUME CALCS					TOTAL VOLUME
	Depth ft	Surface Area sq ft	Incr Volume cu ft	Cum Volume cu ft	Depth ft	Surface Area sq ft	Incr Volume cu ft	Cum Volume cu ft			
54.10	3.10	29224	2895	58046	6.10	7115	706	24194	82240		
54.20	3.20	29757	2949	60994	6.20	7232	717	24911	85906		
54.30	3.30	30290	3002	63996	6.30	7348	729	25640	89637		
54.40	3.40	30823	3055	67052	6.40	7464	741	26381	93433		
54.50	3.50	31357	3109	70160	6.50	7581	752	27133	97293		
54.60	3.60	31890	3162	73322	6.60	7697	764	27897	101219		
54.70	3.70	32423	3215	76538	6.70	7813	775	28672	105210		
54.80	3.80	32956	3269	79806	6.80	7929	787	29459	109265		
54.90	3.90	33489	3322	83128	6.90	8046	799	30258	113386		
55.00	4.00	34022	3375	86503	7.00	8162	810	31068	117571		
55.10	4.10	34527	3427	89930	7.10	8289	822	31891	121821		
55.20	4.20	35033	3478	93408	7.20	8417	835	32726	126134		
55.30	4.30	35538	3528	96936	7.30	8544	848	33574	130510		
55.40	4.40	36044	3579	100515	7.40	8671	861	34434	134949		
55.50	4.50	36549	3629	104144	7.50	8799	873	35308	139452		
55.60	4.60	37054	3680	107824	7.60	8926	886	36194	144018		
55.70	4.70	37560	3730	111554	7.70	9053	899	37093	148647		
55.80	4.80	38065	3781	115335	7.80	9180	912	38004	153339		
55.90	4.90	38571	3831	119166	7.90	9308	924	38929	158095		
56.00	5.00	39076	3882	123048	8.00	9435	937	39866	162914		
56.10	5.10	39574	3932	126980	8.10	9564	950	40816	167796		
56.20	5.20	40073	3982	130962	8.20	9693	963	41778	172741		
56.30	5.30	40571	4032	134994	8.30	9822	976	42754	177748		
56.40	5.40	41069	4082	139076	8.40	9951	989	43742	182818		
56.50	5.50	41568	4131	143207	8.50	10080	1001	44744	187951		
56.60	5.60	42066	4181	147388	8.60	10208	1014	45758	193146		
56.70	5.70	42564	4231	151619	8.70	10337	1027	46785	198405		
56.80	5.80	43062	4281	155900	8.80	10466	1040	47825	203726		
56.90	5.90	43561	4331	160231	8.90	10595	1053	48878	209109		
57.00	6.00	44059	4381	164611	9.00	10724	1066	49944	214556		

RETENTION POND DEPTH/VOLUME CALCULATIONS, PHASE 1 PONDS (Con't):

Elevation ft	SOUTH PORTION VOLUME CALCS					NORTH PORTION VOLUME CALCS					TOTAL VOLUME	
	Depth ft	Surface Area sq ft	Incr Volume cu ft	Cum Volume cu ft	Depth ft	Surface Area sq ft	Incr Volume cu ft	Cum Volume cu ft	Depth ft	Surface Area sq ft	Incr Volume cu ft	Cum Volume cu ft
57.10	6.10	44557	4430	169042	9.10	10853	1079	51023	220065			
57.20	6.20	45056	4480	173522	9.20	10982	1092	52115	225636			
57.30	6.30	45554	4530	178052	9.30	11111	1105	53219	231271			
57.40	6.40	46052	4580	182632	9.40	11240	1117	54336	236968			
57.50	6.50	46551	4630	187261	9.50	11369	1130	55467	242728			
57.60	6.60	47049	4679	191941	9.60	11497	1143	56610	248551			
57.70	6.70	47547	4729	196670	9.70	11626	1156	57766	254436			
57.80	6.80	48045	4779	201449	9.80	11755	1169	58935	260384			
57.90	6.90	48544	4829	206278	9.90	11884	1182	60117	266395			
58.00	7.00	49085	4881	211159	10.00	12086	1198	61315	272474			

Pond Data

Ponding Description	Volume cu ft	Surface Elevation	Depth ft
capacity to overflow inlet	172,741	56.20	8.20

RETENTION POND VOLUME CALCULATIONS:

Total All aphaes

Equation: $\text{Vol} = 1.5(\text{RF}/12)(A)(43560)$ per Weld County Drainage Criteria

where: A = basin area in acres

RF = 100 year, 24 hour rainfall (in) = 4.8 in

Pond No.	Rainfall in	Area ac	vol cu ft
Phases 1, 2 & 3 (total project requirement)	4.80	34.54	902737
Phase 1 Pond (volume available to overflow inlet)			172,471

Phase 2 pond required volume			730,266

Note:

The 100 year, 24 hour rainfall depth is taken from figure 31, NOAA Atlas 2, Volume III

RETENTION POND VOLUME CALCULATIONS:

Total All aphaes

Equation: $\text{Vol} = 1.5(\text{RF}/12)(\text{A})(43560)$ per Weld County Drainage Criteria

where: A = basin area in acres

RF = 100 year, 24 hour rainfall (in) = 4.8 in

Pond No.	Rainfall in	Area ac	vol cu ft
Phases 1, 2 & 3 (total project requirement)	4.80	34.54	902737
Phase 1 Pond (volume available to overflow inlet)			164,490

Phase 2 required volume			738,247

Note:

The 100 year, 24 hour rainfall depth is taken from figure 31, NOAA Atlas 2, Volume III

RETENTION POND DEPTH/VOLUME CALCULATIONS, PHASE 2:

$$\text{Equation: Vol} = (d_2 - d_1) \left(A_1 + A_2 + \frac{A_1 \times A_2}{2} \right) / 3 + (d_3 - d_2) \left(A_3 + A_2 + \frac{A_2 \times A_3}{2} \right) / 3 + \dots$$

Elevation ft	Depth ft	Surface Area sq ft	Incr Volume cu ft	Cum Volume cu ft
43.00	0.00	22,004	0	0
43.10	0.10	33,344	2748	2748
43.20	0.20	44,683	3887	6635
43.30	0.30	56,023	5024	11659
43.40	0.40	67,362	6160	17819
43.50	0.50	78,702	7295	25114
43.60	0.60	90,041	8430	33544
43.70	0.70	101,381	9565	43108
43.80	0.80	112,720	10699	53807
43.90	0.90	124,060	11833	65640
44.00	1.00	135,399	12967	78608
44.10	1.10	136,123	13575	92183
44.20	1.20	136,846	13647	105830
44.30	1.30	137,570	13719	119549
44.40	1.40	138,294	13792	133341
44.50	1.50	139,018	13864	147205
44.60	1.60	139,741	13937	161142
44.70	1.70	140,465	14009	175151
44.80	1.80	141,189	14081	189232
44.90	1.90	141,912	14154	203385
45.00	2.00	142,636	14226	217611
45.10	2.10	143,227	14292	231903
45.20	2.20	143,818	14351	246254
45.30	2.30	144,408	14410	260664
45.40	2.40	144,999	14469	275133
45.50	2.50	145,590	14528	289661
45.60	2.60	146,181	14587	304248
45.70	2.70	146,772	14646	318894
45.80	2.80	147,362	14705	333599
45.90	2.90	147,953	14764	348363
46.00	3.00	148,544	14823	363187
46.10	3.10	149,152	14883	378070
46.20	3.20	149,760	14944	393014
46.30	3.30	150,367	15005	408019
46.40	3.40	150,975	15066	423085
46.50	3.50	151,583	15126	438211
46.60	3.60	152,191	15187	453398
46.70	3.70	152,799	15248	468646
46.80	3.80	153,406	15309	483955
46.90	3.90	154,014	15369	499324
47.00	4.00	154,622	15430	514754

RETENTION POND DEPTH/VOLUME CALCULATIONS, PHASE 2: (Con't)

Elevation ft	Depth ft	Surface Area sq ft	Incr Volume cu ft	Cum Volume cu ft
47.10	4.10	155,231	15491	530246
47.20	4.20	155,839	15552	545797
47.30	4.30	156,448	15613	561410
47.40	4.40	157,057	15674	577084
47.50	4.50	157,666	15735	592818
47.60	4.60	158,274	15795	608614
47.70	4.70	158,883	15856	624470
47.80	4.80	159,492	15917	640387
47.90	4.90	160,100	15978	656365
48.00	5.00	160,709	16039	672404
48.10	5.10	161,325	16100	688504
48.20	5.20	161,940	16162	704666
48.30	5.30	162,556	16223	720889
48.40	5.40	163,171	16285	737174
48.50	5.50	163,787	16346	753520
48.60	5.60	164,402	16408	769928
48.70	5.70	165,018	16469	786397
48.80	5.80	165,633	16531	802928
48.90	5.90	166,249	16592	819520
49.00	6.00	166,864	16654	836174
49.10	6.10	167,495	16716	852890
49.20	6.20	168,126	16779	869670
49.30	6.30	168,757	16842	886512
49.40	6.40	169,388	16906	903418
49.50	6.50	170,019	16969	920386
49.60	6.60	170,650	17032	937418
49.70	6.70	171,281	17095	954513
49.80	6.80	171,912	17158	971671
49.90	6.90	172,543	17221	988892
50.00	7.00	173,174	17284	1006176

Pond Data

Ponding Description	Volume cu ft	Surface Elevation	Depth ft
100 Year Storm (Based on Phase1 overflow inlet elevation of 56.20)	730,266	48.36	5.36
50% of 100 Year Storm (Based on Phase1 overflow inlet elevation of 56.20)	365,133	46.01	3.01

HORIZONTAL WIER CAPACITY CALCULATIONS FOR POND OVERFLOW:

Equation: $Q = CLH^{3/2}$

where: C=3.33
L=length (ft)
H=depth - dia/2 (ft)

Location/Basin or Design Point	Location	C	L ft	H ft	Q (100yr) cfs	v capacity ft/sec
Phase 1 South Pond Overflow Weir D3-8 + D1-2	Phase 1	3.33	16.00	1.00	53.28	3.33
			53.28 > 44.10 OK			
Phase 2 Pond Overflow Weir Des Pt E	Phase 2	3.33	44.00	1.25	204.77	3.72
			204.77 > 179.74 OK			

EXCERPTS FROM SUBSURFACE SOIL INVESTIGATION

Architecture
Structural
Geotechnical



Materials Testing
Forensic
Civil/Planning

ROCKY MOUNTAIN GROUP
EMPLOYEE OWNED

SUBSURFACE SOIL INVESTIGATION

**Transwest - Phase 3
13525 CR 8
Fort Lupton, Colorado**

PREPARED FOR:

**Transwest
13525 CR 8
Ft. Lupton, CO 80621**

JOB NO. 175226

March 16, 2020

Respectfully Submitted,

RMG – Rocky Mountain Group

**Lauren Caruso, P.E.
Geotechnical Project Engineer**



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PROJECT DESCRIPTION AND SCOPE

Project Location

The project lies in part of the northwest quarter of Section 17, Township 1 North, Range 66 West. The site is generally located to the south of the Town of Fort Lupton, Colorado. The site is located to the north of Weld County Road 8, between South Rollie Avenue to the west and Weld County Road 29 to the east. The approximate location of the site is shown in the Site Vicinity Map on Figure 1.

Project Description

The project is to consist of the development of a portion of a developed property for commercial use. It is our understanding that this portion of the development will be occupied by a commercial building that will be two stories in height. We also understand that the total building area is 35,200 square feet with 3,600 square feet being the second floor above the office. The site plan indicates the shop will be located to the north of an existing Transwest building and east of a detention pond.

Scope of Work

RMG was retained to assess the soil conditions and develop geotechnical engineering recommendations to support the commercial land development for the proposed project. Our scope of services consisted of a field investigation, laboratory testing, engineering analysis, and report preparation.

This report presents geotechnical engineering recommendations for the design of foundations as well as pavement design for the auto body shop located on the property listed above. The recommendations in this report are also contingent upon completion of an Open Excavation Observation by RMG, prior to construction of the foundations in order to verify subsurface conditions for the specific excavated site.

The following is excluded from the scope of this report including but not limited to geologic, natural and environmental hazards such as landslides, unstable slopes, seismicity, snow avalanches, water flooding, corrosive soils, erosion, radon, wild fire protection, hazardous waste and natural resources.

Existing Site Conditions

At the time of our field exploration the site was a relatively flat open field located to the north of the parking area for the existing Transwest building. A detention pond was identified to the west of the proposed building site. Topography of the site generally sloped gently down from the eastern portion to the western portion of the site. Vegetation consisted of short weeds and ground cover.

FIELD INVESTIGATION AND LABORATORY TESTING

The information included in this report has been compiled from field reconnaissance, exploratory soil borings and soil laboratory testing. Monitoring programs, which typically include instrumentation and/or observations for surface water flows, slope stability, subsidence, and similar conditions, are not known to exist and were not considered applicable for the scope of this report.

Subsurface Investigation

The subsurface conditions on the site were investigated by drilling six exploratory test borings advanced within the proposed footprint. The approximate locations of the test borings are presented in the Boring Location Plan on Figure 2.

The test borings were advanced with a truck-mounted, continuous-flight auger drill rig to depths of 20 feet below the existing ground surface (bgs). Soil samples were obtained from the test borings in general accordance with ASTM D-3550 utilizing a 2½-inch OD modified California sampler. The approximate depth of groundwater was investigated in each of the test borings at the time of drilling. The static groundwater levels were measured following the completion of drilling. The Test Boring Logs are presented in Figures 3 through 5. An Explanation of Test Boring Logs is presented in Figure 6.

Laboratory Testing

The moisture content for the recovered samples was obtained in the laboratory. Grain-size analysis, Atterberg Limits, and swell/consolidation tests were performed on selected samples for purposes of classification and to develop pertinent engineering properties. A Summary of Laboratory Test Results is presented in Figure 7. Soil Classification and Atterberg Test Results are presented in Figure 8. Swell/Consolidation Test Results are presented in Figures 9 and 10.

SUBSURFACE CONDITIONS

Soil and Bedrock Profile

The subsurface materials encountered in the test borings were classified using the Unified Soils Classification System (USCS). The subsurface materials encountered in the test borings generally consisted of an upper soil that consisted of dry, medium dense to dense silty to clayey sand. The silty to clayey sand extends to the bottom of the test bores in B-1, B-3 and B-5. Underlying the upper soils in B-2, sandy clay was encountered at a depth of 19 feet and extends to the final depth of the test boring. Underlying the upper materials in B-4, claystone bedrock was encountered at an approximate depth of 19 feet below grade and extends to the termination depth of the test boring. Underlying the upper sandy materials in B-6, sandy clay was encountered at an approximate depth of 9 feet and extends to approximately 14 feet below grade where claystone bedrock was encountered and extends to the final termination depth of the test borings.

Additional descriptions and the interpreted distribution (approximate depths) of the subsurface materials are presented on the Test Boring Logs. The classifications shown on the logs are based upon the engineer's classification of the samples at the depths indicated. Stratification lines shown on the logs represent the approximate boundaries between material types and the actual transitions may be gradual and vary with location.

Groundwater

Groundwater was not observed in any of the test borings at the time of drilling or when checked five days following the completion of drilling. Fluctuations in groundwater and subsurface moisture

conditions may occur due to variations in rainfall and other factors not readily apparent at this time. Development of the property and adjacent properties may also affect groundwater levels.

CONCLUSIONS

The following discussion is based on the subsurface conditions encountered in the test borings and on the project characteristics previously described. If conditions are different from those described in this report or the project characteristics change, RMG should be retained to review our recommendations and adjust them, if necessary. The results of this investigation indicate that the site is suitable for the proposed project provided the recommendations presented herein are implemented.

As previously discussed the site is underlain primarily by an upper material comprised of dry, medium dense to dense, silty to clayey sand. Underlying the upper sandy soils, stiff sandy clay was encountered in one test bore at a depth of approximately 9 feet below grade and claystone bedrock as encountered at 14 to 19 feet below grade. The silty to clayey sand sample tested consolidated up to 7.7%. The sandy clay sample tested exhibited swells up to 1.9%. The claystone bedrock sample tested exhibited swells of up to 6.3%. All samples tested were wetted against surcharge pressures of 1,000 psf.

Geotechnical recommendations based on the field investigation and laboratory testing, are presented below. It must be understood that these recommendations should be verified after the excavation on each individual lot is completed.

SITE DEVELOPMENT AND EARTHWORK

Site Preparation

Prior to construction the ground surface in proposed structure and improvement areas should be stripped of existing vegetation, debris, topsoil, undocumented fill, soft, loose, or disturbed native soils, and other deleterious material. Materials generated during clearing operations should be removed from the project site for disposal. Soft, loose, or yielding subgrade should be removed to a depth that exposes firm subgrade and replaced with structural fill. In areas to receive structural fill, the exposed subgrade should be scarified, moisture conditioned, and compacted per the recommendations set forth in this report.

Excavations

The on-site surface and near surface soils may generally be excavated with heavy-duty earthmoving or excavation equipment in good operating condition. During wet weather, earthen berms, swales, or other methods should be used where necessary to route water away from excavations. Water that accumulates in excavations should be promptly pumped out or otherwise removed and the area allowed to dry before resuming construction.

Geotechnical Considerations

The on-site upper sand and clay materials encountered are not suitable for direct bearing of shallow foundations in their current state. Dry and collapsible soils were encountered at and beneath anticipated foundation depths. Where the dry collapsible soils are encountered we recommend reconditioning the soils beneath the foundation components prior to constructing the foundation by

overexcavating, moisture conditioning and recompacting the on-site sand soils that results in a minimum of four feet of reconditioned on-site sand soils beneath the lowest part of the foundation components. Please reference the Structural Fill section below for compaction recommendations. The use of track-mounted excavation equipment or other low-ground-pressure equipment is recommended to reduce the likelihood of loss of stability during excavation. Footings should be placed on similar subsoils to reduce the potential of differential movement across dissimilar soils.

Foundation Wall Backfill

Backfill should be placed in loose lifts not exceeding 8 to 12 inches with material no greater than 4 inches in diameter, moisture conditioned to facilitate compaction (usually within 2 percent of the optimum moisture content) and compacted to 90 percent of the maximum dry density as determined by the Standard Proctor test, ASTM D-698 on exterior sides of walls in landscaped areas. In areas where backfill supports pavement and concrete flatwork, the materials should be moisture conditioned to ± 2 percent optimum moisture content compacted to 95 percent of the maximum dry density as determined by the Standard Proctor test, ASTM D-698.

Fill placed on slopes should be benched into the slope. Maximum bench heights should not exceed 4 feet, and bench widths should be wide enough to accommodate compaction equipment.

The backfill should not be placed on frozen subgrade or allowed to freeze during moisture conditioning and placement. Backfill should be compacted by mechanical means, and foundation walls should be braced during backfilling and compaction.

Structural Fill

Areas to receive structural fill should have topsoil, organic material, or debris removed. The upper 9 inches of the exposed surface soils at the bottom of the excavation should be scarified and moisture conditioned to facilitate compaction (usually within 2 percent of the optimum moisture content) and compacted to a minimum of 95 percent of the maximum dry density as determined by the Standard Proctor test (ASTM D-698) prior to placing structural fill.

Structural fill placed on slopes should be benched into the slope. Maximum bench heights should not exceed 4 feet, and bench widths should be wide enough to accommodate compaction equipment.

Structural fill shall consist of granular, non-expansive material, and it should be placed in loose lifts not exceeding 8 to 12 inches, moisture conditioned to facilitate compaction (usually within 2 percent of the optimum moisture content) and compacted to a minimum of 95 percent of the maximum dry density as determined by the Standard Proctor test, ASTM D-698. The materials should be compacted by mechanical means.

Materials used for structural fill should be approved by RMG prior to use. Structural fill should not be placed on frozen subgrade or allowed to freeze during moisture conditioning and placement.

To verify the condition of the compacted soils, density tests should be performed during placement. The first density tests should be conducted when 24 inches of fill have been placed.

FOUNDATION OPTIONS

Anticipated Foundation Systems

A spread footing foundation system may be utilized at this site, provided a minimum of four feet of reconditioned soils as stated above are beneath the footings, pads and slabs. A maximum allowable bearing pressure of 2,000 psf with no minimum dead load requirement may be used for design purposes.

Foundation components must be below all organic material and should extend 30 inches or more below the lowest exterior finished grade for frost protection. The foundation design should be prepared by a qualified Colorado Registered Professional Engineer using the recommendations presented in this report. This foundation system should be designed to span a minimum of 10 feet under the design loads.

Open Excavation Observations

During construction, foundation excavations should be observed by RMG prior to placing structural fill, forms or concrete to verify the foundation bearing conditions for each structure.

INTERIOR FLOOR SYSTEMS

Interior Floor Slabs

Vertical slab movement of one to two inches is considered possible for slabs bearing on all soil types. In some cases, vertical movement may exceed this range. If movement and associated damage to floors and finishes cannot be tolerated, a structural floor system should be used.

Floor slabs should be separated from structural components to allow for vertical movement. Control and construction joints should be placed in accordance with the latest guidelines and standards published by the American Concrete Institute (ACI) and applicable local Building Code requirements.

Interior Partitions

Interior non-bearing partitions and attached furnishings (e.g., cabinets, shower stalls, etc.) on concrete slabs should be constructed with a void so that they do not transmit floor slab movement to the roof or overlying floor. A void of at least 1-1/2 inches is recommended beneath non-bearing partitions. The void may require reconstruction over the life of the structure to re-establish the void due to vertical slab movement.

LATERAL EARTH PRESSURES

Foundation walls should be designed to resist lateral earth pressures. For the on-site upper sand materials encountered at the site, we recommend an equivalent fluid pressure of 40 pcf. The lateral pressure applies to level, drained backfill conditions. These values assume the backfill will not become saturated during the life of the structure, therefore positive surface drainage must be maintained. It is

also assumed that compaction within approximately 5 feet of the walls will be accomplished with relatively light compaction equipment. Equivalent Fluid Pressures for sloping/undrained conditions should be determined on an individual basis.

SURFACE GRADING AND DRAINAGE

Grading and Irrigation

The ground surface should be sloped from the building with a minimum gradient of 5 percent for the first 10 feet. This is equivalent to 6 inches of fall across this 10-foot zone. If a 10-foot zone is not possible on the upslope side of the structure, then a well-defined swale should be created a minimum 5 feet from the foundation and sloped parallel with the wall with a minimum slope of 2 percent to intercept the surface water and transport it around and away from the structure. Roof drains should extend across backfill zones and landscaped areas to a region that is graded to direct flow away from the structure. Property owners should maintain the surface grading and drainage recommended in this report to help prevent water from being directed toward and/or ponding near the foundations.

Landscaping should be selected to reduce irrigation requirements. Plants used close to foundation walls should be limited to those with low moisture requirements and irrigated grass should not be located within 5 feet of the foundation. To help control weed growth, geotextiles should be used below landscaped areas adjacent to foundations. Impervious plastic membranes are not recommended.

Irrigation devices should not be placed within 5 feet of the foundation. Irrigation should be limited to the amount sufficient to maintain vegetation. Application of more water will increase the likelihood of slab and foundation movements.

The recommendations listed in this report are intended to address normal surface drainage conditions, assuming the presence of groundcover (established vegetation, paved surfaces, and/or structures) throughout the regions upslope from this structure. However, groundcover may not be present due to a variety of factors (ongoing construction/development, wildfires, etc.). During periods when groundcover is not present in the "upslope" regions, higher than normal surface drainage conditions may occur, resulting in perched water tables, excess runoff, flash floods, etc. In these cases, the surface drainage recommendations presented herein (even if properly maintained) may not mitigate all groundwater problems or moisture intrusion into the structure. We recommend that the site plan be prepared with consideration of increased runoff during periods when groundcover is not present on the upslope areas.

Perimeter Drain

A subsurface perimeter drain is recommended around portions of the structure if the structure will have habitable or storage space located below the finished ground surface.

The perimeter drain can be installed as an interior (if a minimum of six inches of free draining aggregate is placed beneath the slab) or exterior perimeter drain system. The perforated drainage pipe should be installed so the top of the pipe is not above the top of the footing and should be surrounded by material to reduce the infiltration of silt into the drainage pipe. The pipe should be installed in one of the following manners:

1) The pipe may be installed as level as possible as long as the pipe is placed in a minimum of six inches of gravel or crushed stone and exits into a sump pit with mechanical means to remove the water.

Or

2) The pipe may be installed as a gravity system with a minimum 1/8 inch fall per 1 foot length surrounded by a minimum six inches of gravel or crushed stone that either daylight to allow free flow drainage or exits into a sump pit with mechanical means to remove the water.

A subsurface perimeter drain is designed to intercept some types of subsurface moisture and not others. Therefore, the drain could operate properly and not mitigate all moisture problems relating to foundation performance or moisture intrusion into the basement area.

CONCRETE

Sulfate testing was performed on selected samples based on ASTM C1580. Test results showed 0% by weight, indicating the soils present Class 0 (Nil to Low) sulfate exposure. Based on these results Type I/II cement or equivalent mixture according to ACI 201.2R-10 is suggested for concrete in contact with the subsurface materials. Cement type shall be designed and approved by a licensed Colorado Professional Engineer and Foundation Designer. Calcium chloride should not be used for the onsite soils. The concrete should not be placed on frozen ground. If placed during periods of cold temperatures, the concrete should be kept from freezing. This may require covering the concrete with insulated blankets and heating. Concrete work should be completed in accordance with the latest applicable guidelines and standards published by ACI.

CLOSING

This report has been prepared for the exclusive purpose of providing geotechnical engineering information and recommendations for development described in this report. RMG should be retained to review the final construction documents prior to construction to verify our findings, conclusions and recommendations have been appropriately implemented.

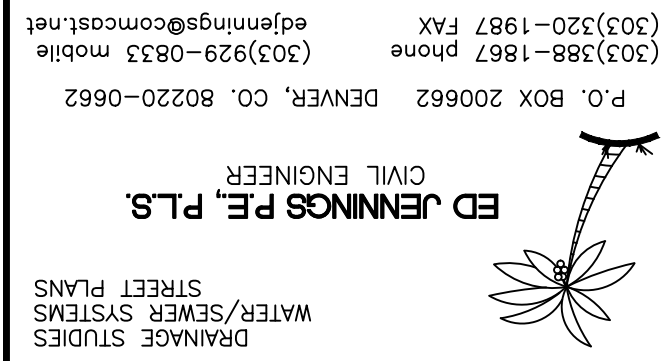
This report has been prepared for the exclusive use by **Transwest** for application as an aid in the design and construction of the proposed development in accordance with generally accepted geotechnical engineering practices. The analyses and recommendations in this report are based in part upon data obtained from test borings and site observations. The nature and extent of variations may not become evident until construction. If variations then become evident, RMG should be retained to review the recommendations presented in this report considering the varied condition, and either verify or modify them in writing.

Our professional services were performed using that degree of care and skill ordinarily exercised, under similar circumstances, by geotechnical engineers practicing in this or similar localities. RMG does not warrant the work of regulatory agencies or other third parties supplying information which may have been used during the preparation of this report. No warranty, express or implied is made by the

preparation of this report. Third parties reviewing this report should draw their own conclusions regarding site conditions and specific construction techniques to be used on this project.

The scope of services for this project does not include, either specifically or by implication, environmental assessment of the site or identification of contaminated or hazardous materials or conditions. Development of recommendations for the mitigation of environmentally related conditions, including but not limited to biological or toxicological issues, are beyond the scope of this report. If the Client desires investigation into the potential for such contamination or conditions, other studies should be undertaken.

If we can be of further assistance in discussing the contents of this report or analysis of the proposed development, from a geotechnical engineering point-of-view, please feel free to contact us.



RETENTION POND SUMMARY TABLE	
	LOT 1 POND
100 YR VOLUME (CU FT)	172,741
SURFACE ELEVATION	56.20
MAXIMUM DEPTH (FT)	8.20
TOP OF BERM	58.0



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May 3, 2017

Mr. James A. Childs, AIA, NCARB
Design and Development Consultants
T-Bone Construction
1310 Fort Street
Colorado Springs, CO 80915

Re: Transwest Summit Body Works
Traffic Impact Analysis
Ft. Lupton, CO
LSC #160930

Dear Mr. Childs:

LSC Transportation Consultants, Inc. has prepared this updated traffic impact analysis for the proposed Transwest Summit Body Works facility. As shown in Figure 1, the site is located east of Weld County Road (WCR) 27 and north of Weld County Road 8 in the City of Fort Lupton, Colorado. A single site access point is proposed to Weld County Road 8.

INTRODUCTION

We acknowledge that the City of Fort Lupton's review of this 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 section 11-6-5(B)3 of the City Code of the City of Fort Lupton.

REPORT CONTENTS

This report contains a description of the existing roadway and traffic conditions adjacent to the site, estimates of future background traffic volumes, the site's proposed land use, proposed locations for site access points, the site's projected trip generation, an assignment of the site-generated traffic volumes to the area roadways, an assessment of the site's traffic impacts, and recommendations for access and adjacent street improvements.

LAND USE AND ACCESS

The 39.2-acre site is located north of WCR 8 about one-half mile east of WCR 27. The site is currently zoned R-O (residential office). There are two existing unoccupied residences located on the site which are planned to be razed with this development. The site is planned to be rezoned to industrial.

Figure 2 shows the proposed site plan. The southeast area of the site is planned to contain a 78,700 square-foot building. About 5,000 square feet will be used as office and administrative space. The remaining space will be used for a body shop for vehicles and trailers including light, medium, and large trucks and semi-trailers. This building will house about 90 employees who will work one shift. Most will work from 7:00 am to 6:00 pm with a small portion of office/administrative employees working a more traditional 8:00 am to 5:00 pm schedule.

The southwest area of the site is planned to contain a 52,200 square-foot building which will be used as a body shop installing van boxes on the body of trucks. This building will house about 45 employees who will work one shift.

There are currently no plans to develop the 10.329-acre area located on the north end of the site and it may remain undeveloped even in the long term future.

Full movement access is planned to WCR 8 about 3,185 feet east of Weld County Road 27. This access will align with a planned access for the parcel south of WCR 8.

ROADWAY AND TRAFFIC CONDITIONS

Area Roadways

Figure 1 shows the roadways in the site's vicinity. The roadways adjacent to the site are identified below followed by a brief description.

- **Weld County Road 27** is a two-lane arterial road which extends north and south through Weld County. The posted speed limit in the vicinity of the site 40 miles per hour (mph). The intersection of WCR 27/WCR 8 is currently signal controlled.
- **Weld County Road 8** extends east and west across Weld County. Adjacent to the site WCR 8 has one through lane in each direction and is classified as a collector. The posted speed limit for eastbound traffic is 35 mph from WCR 27 to the east boundary of the site where the speed limit increases to 55 mph. The posted speed limit for westbound traffic is 55 mph to the west boundary of the site where it decreases to 35 mph.

BACKGROUND TRAFFIC

Figure 4 shows the estimated 2036 background traffic volumes. These volumes are based on an annual growth rate of 5.1 percent as shown in the *Weld County 2035 Transportation Plan*. The 2036 background traffic estimates also include vehicle-trips estimated to be generated by the potential light industrial use on the parcel located just south of the site.

TRIP GENERATION

The vehicle-trips to be generated by the site were estimated using trip generation rates for Light Industrial from *Trip Generation*, 9th Edition, 2012 by the Institute of Transportation Engineers (ITE). Table 1 shows the trip generation estimates. Table 1 also shows the trip generation estimate for the northern 10.3 acres which is not included as part of the currently proposed development.

Following the development of two proposed buildings to be located on the southern portion of the site, the site is projected to generate about 913 new vehicle-trips on the average weekday, with about half entering and half exiting the site during a 24-hour period. During the morning peak-hour, which typically occurs for one hour between 6:30 and 8:30 a.m., about 106 vehicles would enter and 15 vehicles would exit the site. During the afternoon peak-hour, which typically occurs for one hour between 4:15 and 6:15 p.m., about 15 vehicles would enter and 112 would exit the site.

If the north area is developed for industrial uses, the entire site is projected to generate about 1,481 new vehicle-trips on the average weekday, with about half entering and half exiting the site during a 24-hour period. During the morning peak-hour about 174 vehicles would enter and 29 vehicles would exit the site. During the afternoon peak-hour about 33 vehicles would enter and 112 would exit the site.

TRIP DISTRIBUTION AND ASSIGNMENT

Figure 5 shows the estimated directional distribution of the site-generated traffic volumes on the area roadways, which is an important factor in determining the site's traffic impacts. The directional distribution estimates were based on information provided by Transwest.

SITE-GENERATED TRAFFIC

Figure 6 shows the estimated short-term site-generated traffic volumes which assume development of the two proposed buildings to be located on the southern portion of the site only. These volumes were calculated by applying the directional distribution percentages (from Figure 5) to the trip generation estimates (from Table 1).

Figure 7 shows the estimated long-term site-generated traffic volumes which include development of the north end of the site. There are currently no plans for development of this area and it may remain undeveloped even in the long-term future; however, this analysis assumes this area is developed with industrial uses based on the proposed zone change.

EXISTING PLUS SITE-GENERATED TRAFFIC

Figure 8 shows the projected short-term total traffic volumes, which are the sum of the existing traffic volumes (from Figure 3) and the short-term site-generated traffic volumes (from Figure 6). These volumes represent the development's short-term traffic impacts.

2036 TOTAL TRAFFIC

Figure 9 shows the projected 2036 total traffic volumes. These volumes are the sum of 2036 background traffic (from Figure 4) and the long-term site-generated traffic volumes (from Figure 7).

PROJECTED LEVELS OF SERVICE

Level of service (LOS) is a quantitative measure of the level of congestion or delay at an intersection. Level of service is indicated on a scale from "A" to "F". LOS A represents control delay of less than 10 seconds for unsignalized and signalized intersections. LOS F represents control delay of more than 50 seconds for unsignalized intersections and more than 80 seconds for signalized intersections. Table 2 shows the level of service delay ranges.

Table 2 Intersection Levels of Service Delay Ranges		
Level of Service	Signalized Intersections	Unsignalized Intersections
	Control Delay (seconds per vehicle)	
A	≤10 sec	≤10 sec
B	10-20 sec	10-15 sec
C	20-35 sec	15-25 sec
D	35-55 sec	25-35 sec
E	55-80 sec	35-50 sec
F	≥80 sec	≥50 sec

The site access point to WCR 8 was analyzed to determine the projected levels of service for background and total traffic volumes. The site access point was analyzed based on the unsignalized method of analysis procedures found in *the Highway Capacity Manual, 2010 Edition* by the Transportation Research Board. Table 3 show the level of service analysis results. The level of service reports are attached.

The site access point to WCR 8 is projected to operate at a satisfactory level of service (LOS C or better) during the peak-hours as a stop-sign controlled intersection based on existing plus site-generated and 2036 total traffic volumes.

CONCLUSIONS AND RECOMMENDATIONS

Trip Generation

1. Following the development of the two proposed buildings to be located on the southern portion of the site, the site is projected to generate about 913 new vehicle-trips on the average weekday, with about half entering and half exiting the site during a 24-hour period. During the morning peak-hour about

106 vehicles would enter and 15 vehicles would exit the site. During the afternoon peak-hour about 15 vehicles would enter and 112 vehicles would exit the site.

2. If the northern 10.3 acres is developed for industrial uses, then the entire site is projected to generate about 1,481 new vehicle-trips on the average weekday, with about half entering and half exiting the site during a 24-hour period. During the morning peak-hour about 174 vehicles would enter and 29 vehicles would exit the site. During the afternoon peak-hour about 33 vehicles would enter and 174 vehicles would exit the site.

Projected Levels of Service

3. The proposed site access point to Weld County Road 8 is projected to operate at satisfactory levels of service as a stop-sign controlled intersection.

Auxiliary Turn Lanes

4. Based on the criteria contained in the *Weld County Engineering and Construction Criteria*, an east-bound left-turn lane would be required on the WCR 8 approach at the site access point. It is our understanding that the speed limit on WCR 8 is to be reduced to 35 mph adjacent to the site. Based on a posted speed limit of 35 mph, a 310-foot left-turn lane should be provided approaching the site access. A redirect taper of 20:1 is appropriate for 35 mph.
5. Based on the criteria contained in the *Weld County Engineering and Construction Criteria*, a west-bound right-turn deceleration lane would **not** be required on WCR 8 approaching the proposed site access point.
6. Based on the criteria contained in the *Weld County Engineering and Construction Criteria*, a west-bound right-turn acceleration would be required on WCR 8 at the site access point. Based on a posted speed limit of 35 mph, this lane should be 270 feet long plus a 120-foot taper.

* * * * *

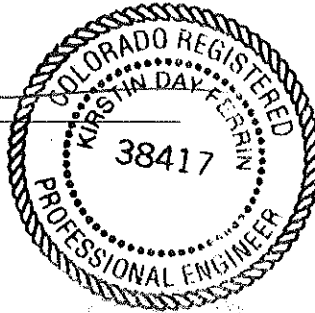
We trust this traffic impact analysis will assist you in planning the Transwest Summit Body Works facility. Please contact me if you have any questions or need further assistance.

Sincerely,

LSC TRANSPORTATION CONSULTANTS, INC.

By: _____

Kirstin D. Ferrin, PE
Senior Transportation Engineer



KDF/CSM/we

Enclosures: Tables 1 - 3
Figures 1 - 8
Traffic Count Reports
Level of Service Reports

Y:\LSC\Projects\2016\160930-TranswestSummitBodyWorks\May-2017\TranswestSummitBodyWorks050317.wpd

Trip Generation Estimate Transwest Summit Body Works

Phase	Land Use	Land Use	Trip Generation Units	Trip Generation Rates ⁽¹⁾						Total Trips Generated					
				Average Weekday		Morning Peak Hour		Afternoon Peak Hour		Average Weekday		Morning Peak Hour		Afternoon Peak Hour	
				Traffic		In	Out	In	Out	Traffic		In	Out	In	Out
Trip Generation Estimate for the Currently Proposed Development															
1	110	General Light Industrial	78.7 KSF ⁽²⁾	6.97		0.81	0.11	0.12	0.85	549	64	9	9	67	
2	110	General Light Industrial	52.2 KSF	6.97		0.81	0.11	0.12	0.85	364	42	6	6	45	
										913	106	15	15	112	
Trip Generation Estimate for Potential Future Land Use															
3	110	General Light Industrial	10.97 acres	51.80		6.23	1.28	1.60	5.66	568	68	14	18	62	
									Total	1,481	174	29	33	174	

Notes:

(1) Source: *Trip Generation*, 9th Edition, 2012, by the Institute of Transportation Engineers (ITE)

(2) KSF = 1,000 square feet of floor area

Source: LSC Transportation Consultants, Inc.

Table 3
Intersection Level of Service Analysis
Transwest Summit Body Works

Intersection Location	Traffic Control	2016 Existing Plus Site- Generated Traffic		Year 2036 Background Traffic		Year 2036 Background Plus Site-Generated Traffic	
		AM	PM	AM	PM	AM	PM
Weld County Road 8/Site Access							
Northbound Approach		---	---	B	B	C	C
Eastbound Left-Turn		A	A	---	---	A	A
Westbound Left-Turn		---	---	A	A	A	A
Southbound Approach		A	A	---	---	A	B
Critical Movement Delay (sec/vehicle)		9.0	9.5	10.2	12.8	16.8	22.7

Notes:

(1) Based on 2010 Highway Capacity Manual (HCM) methodology and Level of Service (LOS) definitions.

Source: LSC Transportation Consultants, Inc.



Approximate Scale
Scale: 1"=1,200'



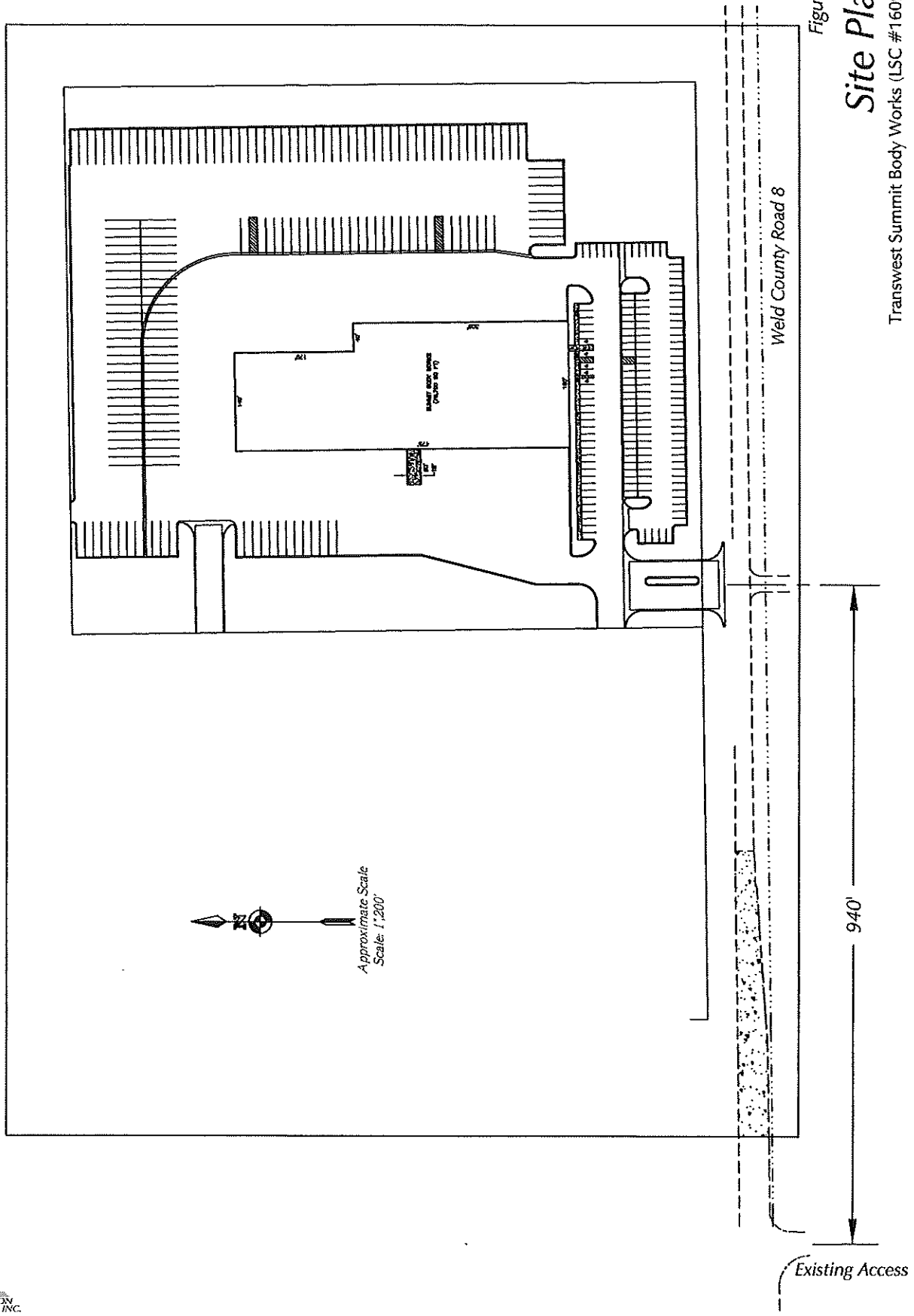
Figure 1
*Vicinity
Map*

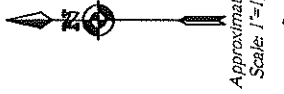
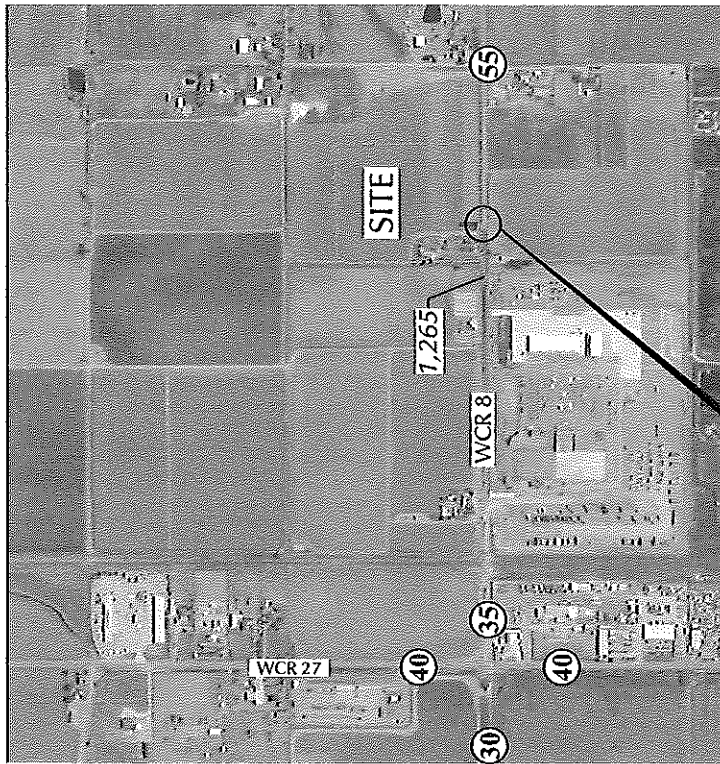
Transwest Summit Body Works (LSC #160930)

Figure 2

Site Plan

Transwest Summit Body Works (LSC #160930)





LEGEND:

(30) = Posted Speed Limit

$\frac{26}{35}$ = $\frac{\text{AM Peak Hour Traffic}}{\text{PM Peak Hour Traffic}}$

2,500 = Average Daily Traffic

Based on counts by Counter Measures Aug 2016

Figure 3

Existing Traffic, Lane Geometry and Traffic Control

Transwest Summit Body Works (LSC #160930)

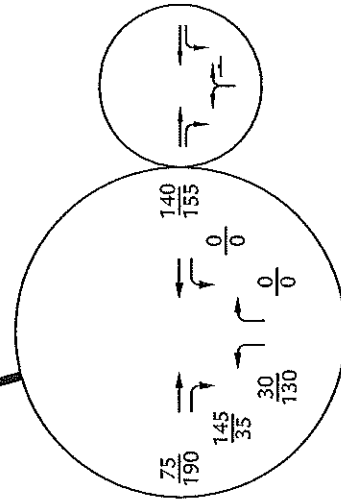
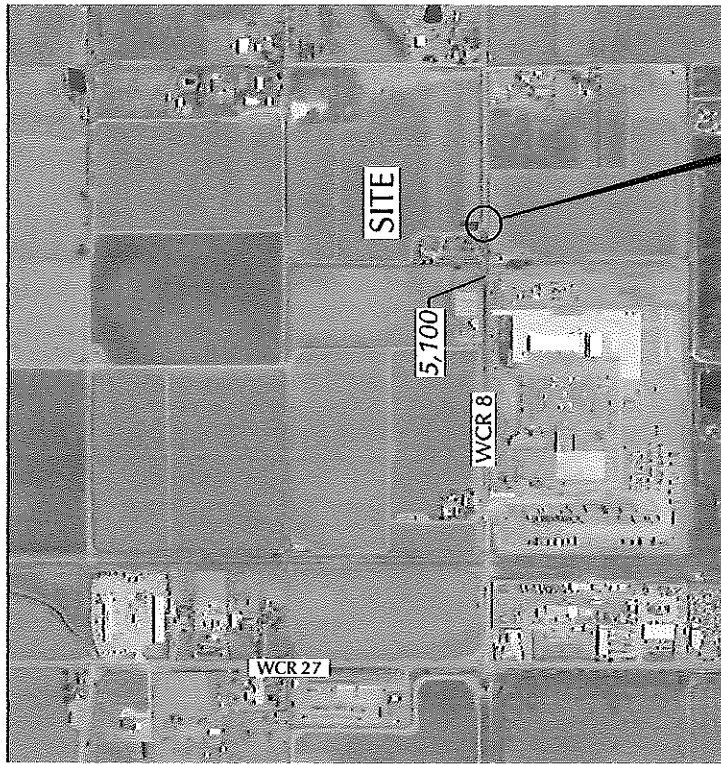


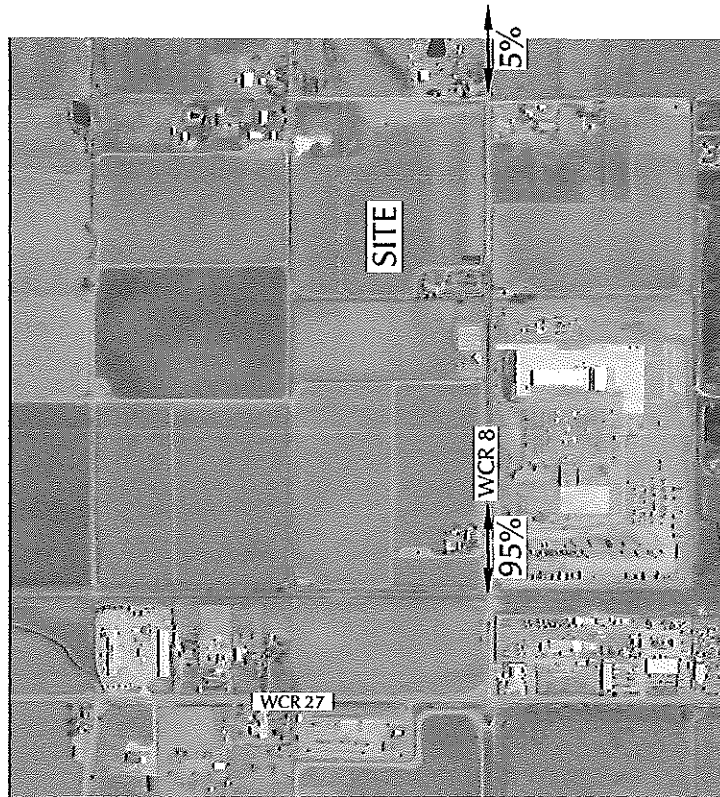
Figure 4
**Year 2036 Background Traffic,
Lane Geometry and Traffic Control**
Transwest Summit Body Works (LSC #160930)

LEGEND:

- ┆ = Stop Sign
- $\frac{26}{35}$ = $\frac{\text{AM Peak Hour Traffic}}{\text{PM Peak Hour Traffic}}$
- 2,500 = Average Daily Traffic



Approximate Scale
Scale: 1"=1,200'



LEGEND:  = Percent Directional Distribution

Figure 5
*Directional Distribution
of Site-Generated Traffic*
Transwest Summit Body Works (LSC #160930)



Approximate Scale
Scale: 1"=1,200'

Figure 6

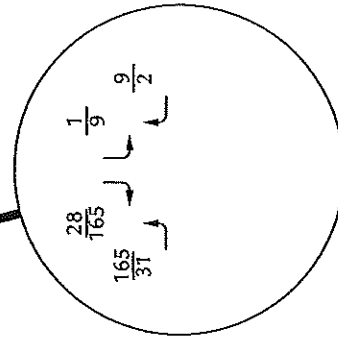
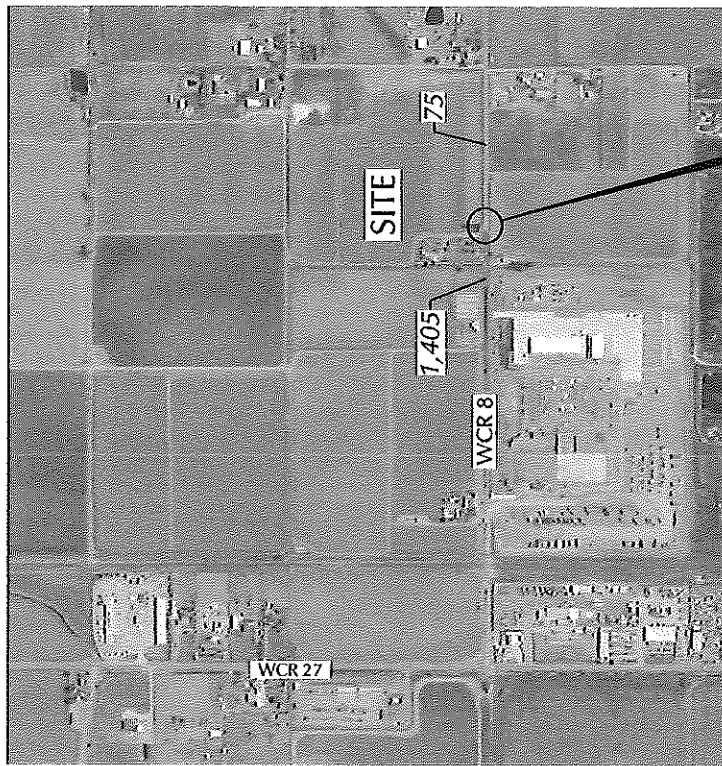
Assignment of Phases 1 & 2 Site-Generated Traffic

Transwest Summit Body Works (LSC #160930)

LEGEND:

$\frac{26}{35}$ = $\frac{\text{AM Peak Hour Traffic}}{\text{PM Peak Hour Traffic}}$

2,500 = Average Daily Traffic



Approximate Scale
Scale: 1"=1,200'

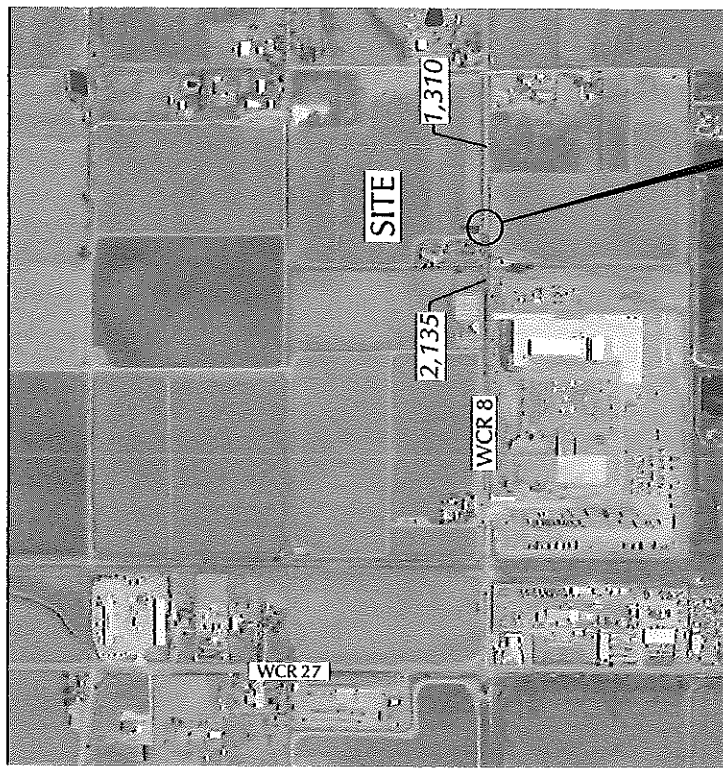
Figure 7

Assignment of Buildout Site-Generated Traffic

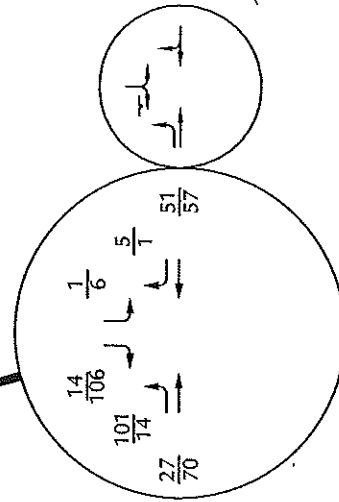
Transwest Summit Body Works (LSC #160930)

LEGEND:

$\frac{26}{35}$ = AM Peak Hour Traffic
PM Peak Hour Traffic
2,500 = Average Daily Traffic



Approximate Scale
Scale: 1"=1,200'



LEGEND:

┆ = Stop Sign

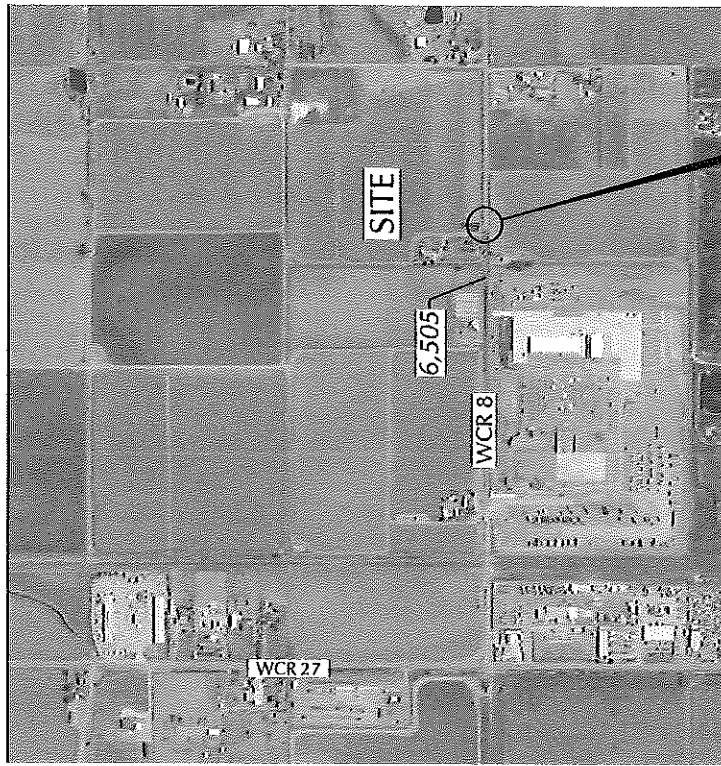
$\frac{26}{35}$ = AM Peak Hour Traffic
PM Peak Hour Traffic

2,500 = Average Daily Traffic

Figure 8

Existing plus Phases 1 & 2 Site-Generated Traffic, Lane Geometry and Traffic Control

Transwest Summit Body Works (LSC #160930)



Approximate Scale
Scale: 1"=1,200'

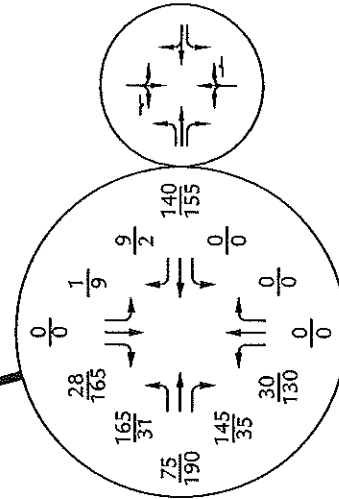


Figure 9

Year 2036 Total Traffic, Lane Geometry and Traffic Control

Transwest Summit Body Works (LSC #160930)

LEGEND:

- ↑ = Stop Sign
- $\frac{26}{35}$ = AM Peak Hour Traffic
PM Peak Hour Traffic
- 2,500 = Average Daily Traffic

COUNTER MEASURES INC.

Location: CR-8 E/O CR-27
 City: FORT LUPTON
 County: WELD
 Direction: EASTBOUND-WESTBOUND

1889 YORK STREET
 DENVER, COLORADO 80206
 303-333-7409

Site Code: 080918
 Station ID: 080918

Start Time	09-Aug-1 Tue	EB	WB							Total
12:00 AM		2	0							2
01:00		1	2							3
02:00		4	2							6
03:00		5	7							12
04:00		4	9							13
05:00		4	35							39
06:00		27	51							78
07:00		22	49							71
08:00		24	29							53
09:00		20	22							42
10:00		32	42							74
11:00		38	42							80
12:00 PM		47	34							81
01:00		44	30							74
02:00		38	33							71
03:00		48	41							89
04:00		70	57							127
05:00		68	46							114
06:00		50	39							89
07:00		32	24							56
08:00		27	9							36
09:00		18	10							28
10:00		10	5							15
11:00		5	5							10
Total		640	623							1263
Percent		50.7%	49.3%							
AM Peak	-	11:00	06:00	-	-	-	-	-	-	11:00
Vol.	-	38	51	-	-	-	-	-	-	80
PM Peak	-	16:00	16:00	-	-	-	-	-	-	16:00
Vol.	-	70	57	-	-	-	-	-	-	127

Intersection	
Int Delay, s/veh	4.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑	↑		↰	
Traffic Vol, veh/h	101	27	51	5	1	14
Future Vol, veh/h	101	27	51	5	1	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	310	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	20	5	5	20	20	20
Mvmt Flow	119	32	60	6	1	16

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	66	0	332
Stage 1	-	-	63
Stage 2	-	-	269
Critical Hdwy	4.3	-	6.6
Critical Hdwy Stg 1	-	-	5.6
Critical Hdwy Stg 2	-	-	5.6
Follow-up Hdwy	2.38	-	3.68
Pot Cap-1 Maneuver	1429	-	628
Stage 1	-	-	916
Stage 2	-	-	736
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1429	-	576
Mov Cap-2 Maneuver	-	-	576
Stage 1	-	-	916
Stage 2	-	-	675

Approach	EB	WB	SB
HCM Control Delay, s	6.1	0	9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1429	-	-	-	913
HCM Lane V/C Ratio	0.083	-	-	-	0.019
HCM Control Delay (s)	7.7	-	-	-	9
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0.3	-	-	-	0.1

Intersection							
Int Delay, s/veh	4.6						
Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations	↰	↑	↱		↰		
Traffic Vol, veh/h	14	70	57	1	6	106	
Future Vol, veh/h	14	70	57	1	6	106	
Conflicting Peds, #/hr	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Stop	Stop	
RT Channelized	-	None	-	None	-	None	
Storage Length	310	-	-	-	0	-	
Veh in Median Storage, #	-	0	0	-	0	-	
Grade, %	-	0	0	-	0	-	
Peak Hour Factor	85	85	85	85	85	85	
Heavy Vehicles, %	20	5	5	20	20	20	
Mvmt Flow	16	82	67	1	7	125	

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	68	0	-	0	183	68
Stage 1	-	-	-	-	68	-
Stage 2	-	-	-	-	115	-
Critical Hdwy	4.3	-	-	-	6.6	6.4
Critical Hdwy Stg 1	-	-	-	-	5.6	-
Critical Hdwy Stg 2	-	-	-	-	5.6	-
Follow-up Hdwy	2.38	-	-	-	3.68	3.48
Pot Cap-1 Maneuver	1426	-	-	-	767	947
Stage 1	-	-	-	-	911	-
Stage 2	-	-	-	-	867	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1426	-	-	-	758	947
Mov Cap-2 Maneuver	-	-	-	-	758	-
Stage 1	-	-	-	-	911	-
Stage 2	-	-	-	-	857	-

Approach	EB	WB	SB
HCM Control Delay, s	1.3	0	9.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1426	-	-	-	935
HCM Lane V/C Ratio	0.012	-	-	-	0.141
HCM Control Delay (s)	7.6	-	-	-	9.5
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.5

Intersection						
Int Delay, s/veh	0.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Vol, veh/h	75	145	0	140	30	0
Future Vol, veh/h	75	145	0	140	30	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	310	310	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	5	20	20	5	20	20
Mvmt Flow	80	154	0	149	32	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	80	0	229	80
Stage 1	-	-	-	-	80	-
Stage 2	-	-	-	-	149	-
Critical Hdwy	-	-	4.3	-	6.6	6.4
Critical Hdwy Stg 1	-	-	-	-	5.6	-
Critical Hdwy Stg 2	-	-	-	-	5.6	-
Follow-up Hdwy	-	-	2.38	-	3.68	3.48
Pot Cap-1 Maneuver	-	-	1411	-	721	932
Stage 1	-	-	-	-	900	-
Stage 2	-	-	-	-	836	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1411	-	721	932
Mov Cap-2 Maneuver	-	-	-	-	721	-
Stage 1	-	-	-	-	900	-
Stage 2	-	-	-	-	836	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	721	-	-	1411	-
HCM Lane V/C Ratio	0.044	-	-	-	-
HCM Control Delay (s)	10.2	-	-	0	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection

Int Delay, s/veh 3.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Vol, veh/h	190	35	0	155	130	0
Future Vol, veh/h	190	35	0	155	130	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	310	310	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	5	20	20	5	20	20
Mvmt Flow	202	37	0	165	138	0

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	202
Stage 1	-	-	202
Stage 2	-	-	165
Critical Hdwy	-	4.3	6.6
Critical Hdwy Stg 1	-	-	5.6
Critical Hdwy Stg 2	-	-	5.6
Follow-up Hdwy	-	2.38	3.68
Pot Cap-1 Maneuver	-	1269	599
Stage 1	-	-	791
Stage 2	-	-	822
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	1269	599
Mov Cap-2 Maneuver	-	-	599
Stage 1	-	-	791
Stage 2	-	-	822

Approach	EB	WB	NB
HCM Control Delay, s	0	0	12.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	599	-	-	1269	-
HCM Lane V/C Ratio	0.231	-	-	-	-
HCM Control Delay (s)	12.8	-	-	0	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.9	-	-	0	-

Intersection												
Int Delay, s/veh	3.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↑			↕			↕	
Traffic Vol, veh/h	165	75	145	0	140	9	30	0	0	1	0	28
Future Vol, veh/h	165	75	145	0	140	9	30	0	0	1	0	28
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	310	-	310	310	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	20	5	20	20	5	5	20	20	20	20	20	20
Mvmt Flow	176	80	154	0	149	10	32	0	0	1	0	30

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	159	0	0	80	0	0	600	590	80	585	585	154
Stage 1	-	-	-	-	-	-	431	431	-	154	154	-
Stage 2	-	-	-	-	-	-	169	159	-	431	431	-
Critical Hdwy	4.3	-	-	4.3	-	-	7.3	6.7	6.4	7.3	6.7	6.4
Critical Hdwy Stg 1	-	-	-	-	-	-	6.3	5.7	-	6.3	5.7	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.3	5.7	-	6.3	5.7	-
Follow-up Hdwy	2.38	-	-	2.38	-	-	3.68	4.18	3.48	3.68	4.18	3.48
Pot Cap-1 Maneuver	1318	-	-	1411	-	-	388	397	932	397	399	847
Stage 1	-	-	-	-	-	-	569	553	-	808	737	-
Stage 2	-	-	-	-	-	-	792	733	-	569	553	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1318	-	-	1411	-	-	336	344	932	356	346	847
Mov Cap-2 Maneuver	-	-	-	-	-	-	336	344	-	356	346	-
Stage 1	-	-	-	-	-	-	493	479	-	700	737	-
Stage 2	-	-	-	-	-	-	764	733	-	493	479	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.5	0	16.8	9.6
HCM LOS			C	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	336	1318	-	-	1411	-	-	809
HCM Lane V/C Ratio	0.095	0.133	-	-	-	-	-	0.038
HCM Control Delay (s)	16.8	8.2	-	-	0	-	-	9.6
HCM Lane LOS	C	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0.3	0.5	-	-	0	-	-	0.1

Intersection												
Int Delay, s/veh	7.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑	↱		↕			↕	
Traffic Vol, veh/h	31	190	35	0	155	2	130	0	0	9	0	165
Future Vol, veh/h	31	190	35	0	155	2	130	0	0	9	0	165
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	310	-	310	310	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	20	5	20	20	5	20	20	20	20	20	20	20
Mvmt Flow	33	202	37	0	165	2	138	0	0	10	0	176

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	167	0	0	202	0	0	522	435	202	434	434	166
Stage 1	-	-	-	-	-	-	268	268	-	166	166	-
Stage 2	-	-	-	-	-	-	254	167	-	268	268	-
Critical Hdwy	4.3	-	-	4.3	-	-	7.3	6.7	6.4	7.3	6.7	6.4
Critical Hdwy Stg 1	-	-	-	-	-	-	6.3	5.7	-	6.3	5.7	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.3	5.7	-	6.3	5.7	-
Follow-up Hdwy	2.38	-	-	2.38	-	-	3.68	4.18	3.48	3.68	4.18	3.48
Pot Cap-1 Maneuver	1309	-	-	1269	-	-	438	488	795	502	489	834
Stage 1	-	-	-	-	-	-	700	656	-	795	728	-
Stage 2	-	-	-	-	-	-	712	727	-	700	656	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1309	-	-	1269	-	-	339	476	795	492	477	834
Mov Cap-2 Maneuver	-	-	-	-	-	-	339	476	-	492	477	-
Stage 1	-	-	-	-	-	-	682	639	-	775	728	-
Stage 2	-	-	-	-	-	-	562	727	-	682	639	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.9	0	22.7	10.8
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	339	1309	-	-	1269	-	-	805
HCM Lane V/C Ratio	0.408	0.025	-	-	-	-	-	0.23
HCM Control Delay (s)	22.7	7.8	-	-	0	-	-	10.8
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %ile Q(veh)	1.9	0.1	-	-	0	-	-	0.9

TRANSWEST - PHASE 3

13525 CO RD 8, FORT LUPTON, CO 80621

TRANSWEST

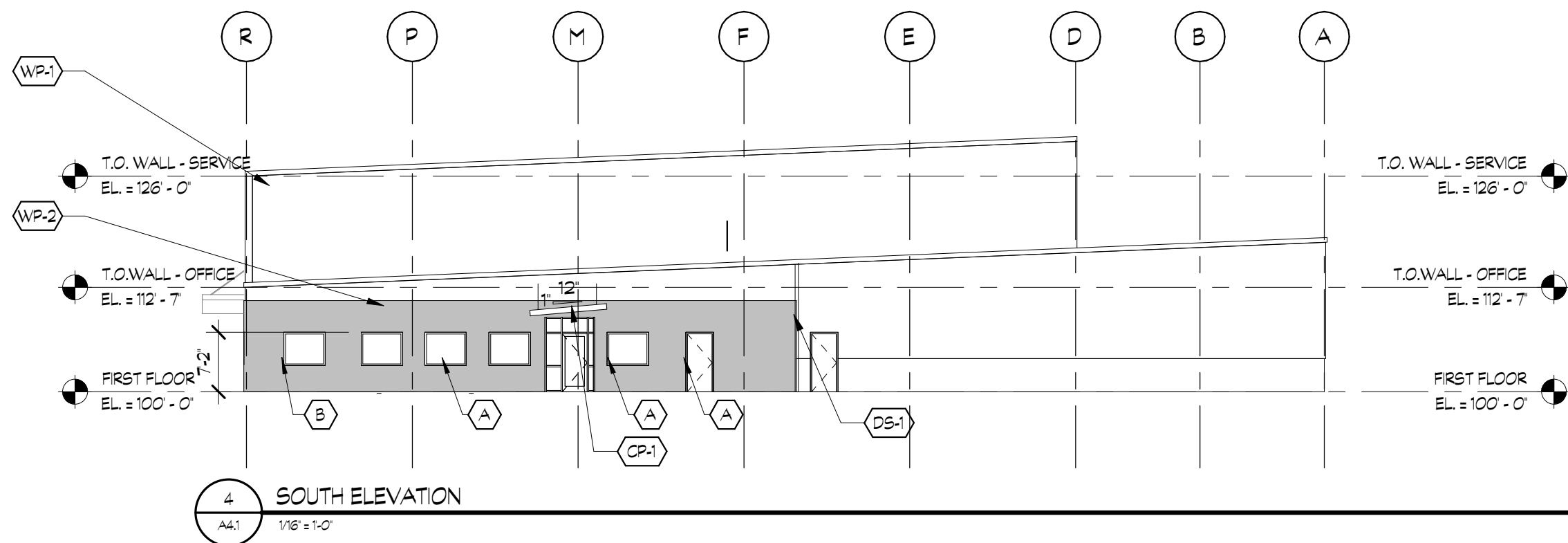
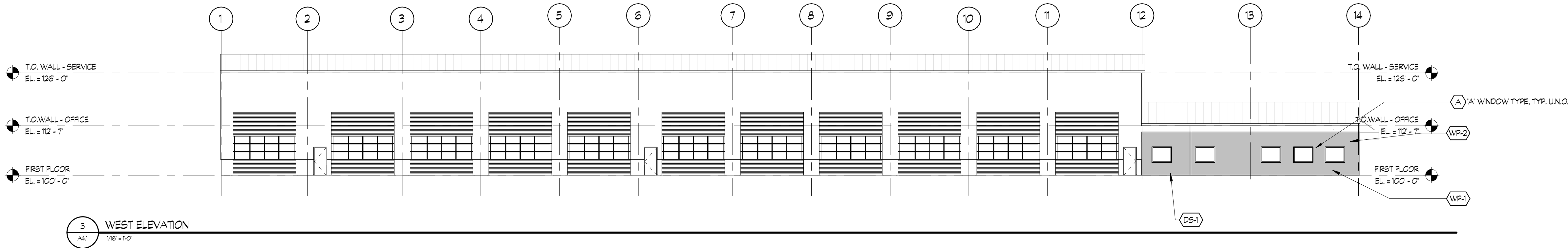
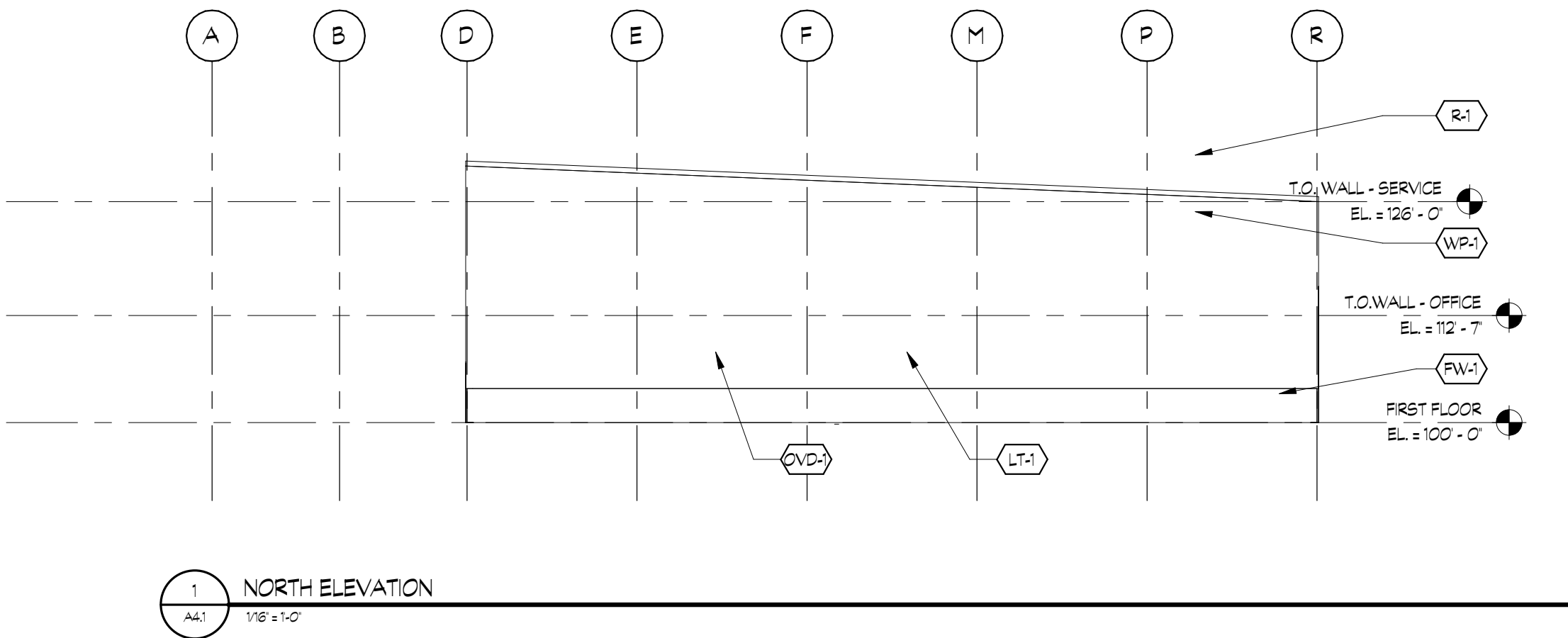
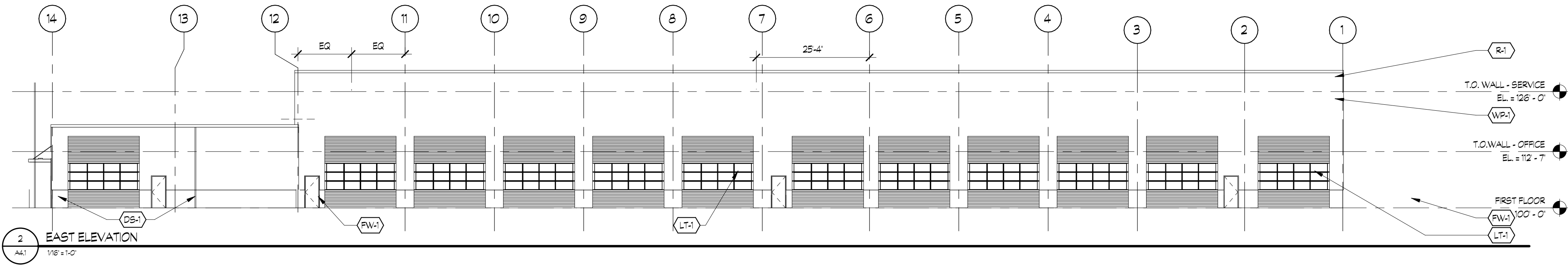
PLAN UPDATE - 02/02/2021

Issued For SD:
Issued For DD:
Issued For Permit:
Issued For Construction:
Revision Number Revision Date

Seal:
19006
Plot Date: 2/11/2021 3:04:36 PM

BUILDING
ELEVATIONS

A4.1



EXTERIOR MATERIALS						
KEYNOTE	DESCRIPTION	MATERIAL	MANUFACTURER	PRODUCT NAME	COLOR NAME	REMARKS
CP-1	PREFABRICATED CANOPY	ALUMINUM	MAPES	LUMIDECK	RED	PEMB MFR. PROVIDED BACKING
DS-1	PREFABRICATED DOWNSPOUT	ALUMINUM				PREFINISHED DOWNSPOUT
FW-1	PEMB WALL PANEL	CONCRETE FOUNDATION WALL			PAINTED TO MATCH SUMMIT GRAY	RE: STRUCTURAL
LT-1	EXTERIOR LIGHT					RE: ELECTRICAL
OVD-1	OVHD. DOOR	ALUM./GLASS	CLOPAY	14' X 16' HIGHLIFT	MATCH REGAL WHITE	RE: PEMB MFR. DRAWINGS
R-1	PRE-FINISHED STANDING SEAM SHEET METAL ROOF	PRE-FINISHED STANDING SEAM METAL ROOF	AMERICAN	STANDING SEAM 360, 24 GA.	REGAL WHITE	RE: PEMB MFR. DRAWINGS
WP-1	PEMB WALL PANEL	PEMB WALL PANEL	AMERICAN	VEB-RB, 24 GA.	REGAL WHITE	RE: PEMB MFR. DRAWINGS
WP-2	PEMB WALL PANEL	PEMB WALL PANEL	AMERICAN	CECOROC, 20 GA.	SUMMIT GRAY	RE: PEMB MFR. DRAWINGS



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: Ed Jennings (PE)
From: Roy Vestal
Date: March 26, 2021
Subject: Transwest Truck & Trailer Phase 3 Site Plans & Amended Plat
(LUP2021-0009; AMD2021-0002; SPR2021-0003 & SPR2021-0004)
Public Works Review

Public Works has reviewed the submitted documents for the above referenced development project with the following comments for inclusion with the Site Plan submittal. Be advised, review of construction drawings is for general compliance with city standards. There may be additional concerns as this design develops.

1. Site Plan

- a. The water line will require an easement dedication by separate document, 20' wide.
- b. Add acknowledgement and signature block for owner accepting maintenance responsibilities for the Private drainage facilities on site.

2. 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.

3. Utilities

a. Services

- i. CD's indicate a ¾" domestic water service tap.
 1. CBT required is 1.3 Shares = \$78,000.00 cash in lieu
 2. WTP PIF = \$9,825.00 (effective April 5, 2021)
- ii. CD's indicate a 4" sanitary sewer service
 1. WWTP PIF = \$19,000.00 (effective April 5, 2021)

b. Water - Chapter 3

- i. Sheet 9: The east - west leg of the water line on the north side of the new building should be centered in the easement, which would place it 10-feet away from the building.

- ii. Backflow prevention assemblies shall be tested by a Certified Cross-Connection Control Technician upon installation and tested at least annually, thereafter.
- iii. Plumbing plans should identify back flow prevention devices and will require inspection by a certified backflow prevention technician and registration on the City's Aqua Flow web site. The backflow device will require annual inspections and entry to the City's Cross Connection Inspection Control system (in accordance with Section 13-85 of the City Municipal Code).

c. Sanitary Sewer - Chapter 4

- i. Sheet 12 - Proposed sanitary service profile, why not do one lift station and use a pressure service line to a point where it will gravity flow to the main? Two lift station seem too complex, a grinder pump and pressure line would be more efficient and less maintenance.
- ii. Need details and design for lift station or grinder pump / pressure line.

d. Storm Drainage - Chapter 5

- i. Drainage Study as submitted is acceptable.
- ii. Please add retention pond maintenance requirements.
- iii. Storm sewer outfalls to the retention ponds should be provided with a toe wall. Need detail of "Type M RIPRAP".
- iv. Provide seeding specification for retention ponds with the Construction Drawings. Would like to avoid the weed traps that have developed during the first 2 phases.

e. Traffic Control - Chapter 8

- i. The Traffic Study submitted is the original with the Phase 3 building drawing added at the end. At a minimum, I need to see what the additional traffic from the Phase 3 construction will generate.

f. Construction Notes:

- i. General Water-Sewer #27 - 4" sewer service minimum slope is 2%.

4. **A Public Works Permit** will be required for construction of the water line, service tap and sanitary service.

There may be additional concerns as this design develops.

March 25, 2021

City of Fort Lupton Planning Department
130 South McKinley Ave.
Fort Lupton, CO 80621

Re: LUP2021-0009; AMD2021-0002; SPR2021-0003 & SPR2021-0004 - 1st Submittal - Transwest Truck & Trailer Phase 3 Site Plans & Amended Plat

Dear Magaly Marales-Tejada:

On behalf of United Power, Inc., thank you for inviting us to review and comment on the 1st submittal for Transwest Truck & Trailer Phase 3 Site Plans for lot 1 & 2 and the amended plat. After review of the information:

- **Lot Line** - We have no concern or objection to vacating the north line and the new proposed lot line for lots 1 & 2, which now would run straight north/south.
- **Plat Easements** - We request an 8'-10' dry utility easements around the perimeter of lot 1 & lot 2.
 - According to the Villano Minor (R#4081664), there should be a utility easement on the west side of lot 2. Can we please show this on the plat and the site plans?
 - I am assuming the 8' U.E. that runs north/south between lot 1 & 2 goes the entire length of lot 1 & 2. Please ensure it does. Please make note of that on the site plans.
 - We request an 8' to 10' U.E. along the north side of lot 1 & 2. Please call it out on the site plan.
 - We request an 8' to 10' U.E. along the east side lot 1.
 - According to the Transwest North Minor Subd plat (R#4380392) there is a 20' Non-Exclusive Dry U.E. along the south end of lots 1 & 2. Can we please show this on the plat and site plans?
- **Site plans** – Could we include all existing utility easements from plats reception # 4081664 & reception # 4380392 and any proposed utility easements to the proposed plat be placed on the site plans for lot 1 & 2?

Please have the property owner/developer/contractor submit an application for new or upgraded service 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 document(s). Obtaining easements via a separate document 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 look forward to safely and efficiently providing reliable electric power and outstanding service.

Thank you,

A handwritten signature in black ink, reading "Samantha Riblett". The signature is fluid and cursive, with the first name "Samantha" written in a larger, more prominent script than the last name "Riblett".

Samantha Riblett
United Power, Inc.
Right of Way Administrative Assistant
O: 303-637-1324 | Email: platreferral@unitedpower.com

Magaly Morales-Tejada

From: Kristen Thompson <kthompson@northernwater.org>
Sent: Monday, March 8, 2021 2:22 PM
To: Magaly Morales-Tejada
Cc: Maria Lancto; Todd Hodges; Alyssa Knutson
Subject: RE: Referral Response Request: Transwest Truck & Trailer Phase 3 Site Plans & Amended Plat (LUP2021-0009; AMD2021-0002; SPR2021-0003 & SPR2021-0004)

Magaly,

We do not have any comments on this request.

Thank you
Kris

Disclaimer Notice: An allotment of Colorado-Big Thompson water is subject to the Water Conservancy Act, C.R.S 37-45-101 et seq, the authority of the Board of Directors of the Northern Colorado Water Conservancy District, and other relevant laws and regulations. The information provided in this email is not binding on Northern Water because the legal rights to Colorado-Big Thompson Project Allotments are subject to the continuing discretion of the Board of Directors of Northern Water and other legal limitations and requirements. Northern Water staff and counsel cannot provide you with legal advice, and you are advised to seek legal counsel with respect to the subject matter of this



Kristen Thompson | Inclusion Specialist
220 Water Ave | Berthoud, CO 80513
Direct: 970-622-2237
Main: 800-369-RAIN (7246)
www.northernwater.org
[Facebook](#) | [Twitter](#) | [Instagram](#) | [LinkedIn](#)

From: Magaly Morales-Tejada <MMTejada@Fortluptonco.gov>
Sent: Monday, March 8, 2021 1:45 PM
Cc: Maria Lancto <MLancto@Fortluptonco.gov>; Todd Hodges <thodges@Fortluptonco.gov>; Alyssa Knutson <AKnutson@Fortluptonco.gov>
Subject: Referral Response Request: Transwest Truck & Trailer Phase 3 Site Plans & Amended Plat (LUP2021-0009; AMD2021-0002; SPR2021-0003 & SPR2021-0004)

External Message - Please be cautious when replying or opening links or attachments in this email

Good Afternoon,

The documentation located at the following link is submitted to you for review and recommendation for an amended plat and site plans being reviewed by the City of Fort Lupton. The application documents can be reviewed at the following link: <https://www.fortluptonco.gov/DocumentCenter/Index/584>.

Any comments you consider relevant to this request would be appreciated. Please reply by **March 29, 2021** 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, April 8, 2021 at 6:00 PM; and
- City Council: Tuesday, April 20, 2021 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



The information transmitted is intended only for the person or entity to which it is addressed and may contain CONFIDENTIAL material. If you receive this information in error, please delete or destroy the information.

**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 site plan known as the Transwest Truck and Trailer Phase 3 Lot 2 Site Plan located at 13517 County Road 8 Fort Lupton, Colorado in the 'I-1' Light Industrial Zone District pursuant to the City of Fort Lupton Municipal Code Notice Requirements.

The public hearing is to be held before the Planning Commission on April 8, 2021, at 6:00 P.M., and before the City Council on April 20, 2021, at 7:00 P.M. or as soon as possible thereafter.

The public hearing shall be held at the Fort Lupton City Hall, 130 S. McKinley Avenue in Fort Lupton, Colorado. In the event that there are City Hall closures due to COVID-19 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

ALL INTERESTED PERSONS MAY ATTEND

LEGAL DESCRIPTION

A PARCEL OF LAND IN THE CITY OF FORT LUPTON, COLORADO LOCATED IN THE SW1/4, SE1/4, SECTION 17, TOWNSHIP 1 NORTH, RANGE 66 WEST OF THE 6TH PRINCIPAL MERIDIAN AND MORE PARTICULARLY DESCRIBED AS FOLLOWS:

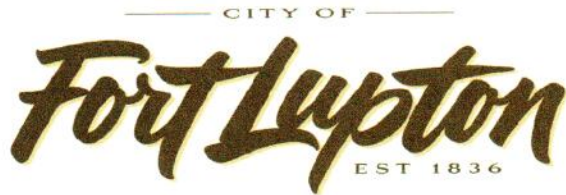
LOT 2, TRANSWEST NORTH MINOR SUBDIVISION-FIRST AMENDMENT, CITY OF FORT LUPTON, COUNTY OF WELD, STATE OF COLORADO CONTAINING 38.242 ACRES MORE OR LESS.

Legal Ad No.: FLP222264

First Publication: March 24, 2021

Last Publication: March 24, 2021

Published In: Fort Lupton Press



COME PAINT YOUR FUTURE WITH US

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

Sign Posting Affidavit

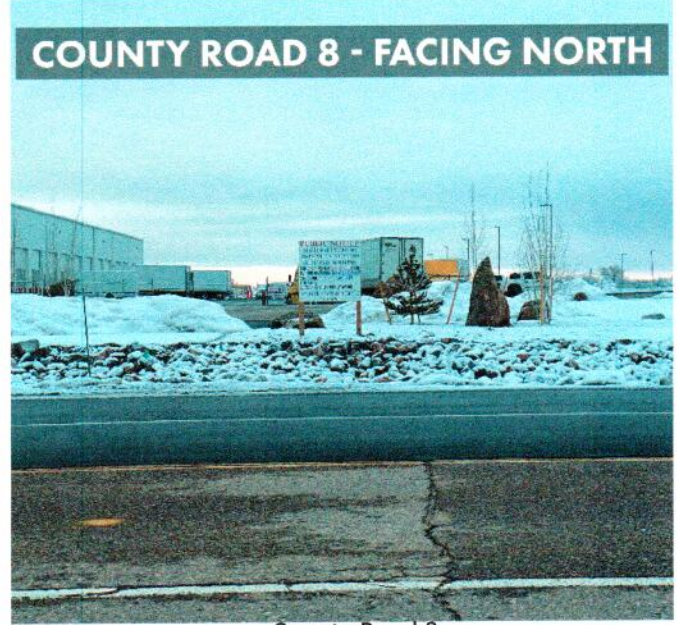
Transwest Truck and Trailer Phase III

Project No. LUP2021-0009

Plan Nos. AMD2021-0002; SPR2021-0003 & SPR20201-0004



County Road 8



County Road 8

I, Kyle Schmidt hereby acknowledge that the aforementioned property was posted in accordance with City Codes. Said public hearing notice was posted on this 23rd day of March 2021

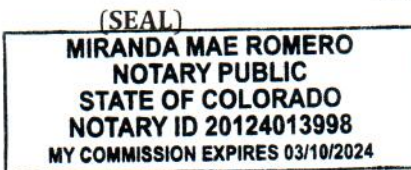
[Signature] - GEP Investments

Signature of Owner or Owner's Representative

The foregoing instrument was acknowledged before me by Kyle Schmidt, this 23rd day of March, 2021. Witness my hand and

seal. My commission expires 3-10-2024.

[Signature]
Notary Public





CERTIFICATE OF MAILING

I, the undersigned, hereby certify that on the 22nd day of March, 2021, a true and correct copy of the foregoing Notice of Public Hearings and annexation map for the Transwest Truck and Trailer Phase 3 Site Plans was sent via U.S. Mail, postage pre-paid, to the following addresses:

FORT LUPTON FIRE PROTECTION DISTRICT
1121 DENVER AVE
FORT LUPTON, CO 80621

KAMBER R MORRISON
ANDREW R MORRISON
13757 COUNTY ROAD 8
FORT LUPTON, CO 80621

JOYCE KAY HUETT
RICHARD A HUETT
13759 COUNTY ROAD 8
FORT LUPTON, CO 80621

VILLANO BROTHERS FAMILY
INVESTMENTS LLC
13050 COUNTY ROAD 10
FORT LUPTON, CO 80621

KATHERINE A DEAN
THEODORE E DEAN
13746 COUNTY ROAD 9
FORT LUPTON, CO 80621

VERYL M SCHOEN
PO BOX 68
FORT LUPTON, CO 80621

KEN BROUGH
13767 COUNTY ROAD 8
FORT LUPTON, CO 80621

HALLIBURTON ENERGY SERVICES INC
C/O PROPERTY TAX DEPT
PO BOX DRAWER 1431
DUNCAN, OK 73536

DARRELL G PHILLIPS
PO BOX 483
PLATTEVILLE, CO 80651

ADAM HENRY ROBILLARD
LACY KAE ABFALTER
1013 COUNTY ROAD 7
ERIE, CO 80516

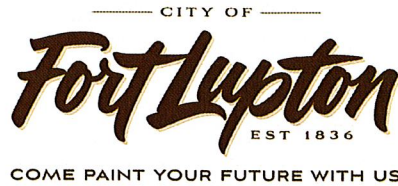
BRANNAN SAND AND GRAVEL
COMPANY LLC
2500 BRANNAN WAY
DENVER, CO 80229

WHEAT RIDGE GROUP LLC
7310 W 52ND AVE
APT A174
ARVADA, CO 80002

RJ ENTERPRISES 1
13749 COUNTY ROAD 9
FORT LUPTON, CO 80621



City Official



**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 two site plans known as the Transwest Truck and Trailer Phase 3 Lot 1 Site Plan located at 13525 County Road 8 and the Transwest Truck and Trailer Phase 3 Lot 2 Site Plan located at 13517 County Road 8 Fort Lupton, Colorado in the 'I-1' Light Industrial Zone District pursuant to the City of Fort Lupton Municipal Code Notice Requirements.

The public hearings are to be held before the Planning Commission on April 8, 2021, at 6:00 P.M., and before the City Council on April 20, 2021, 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 there are City Hall closures due to COVID-19 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

ALL INTERESTED PERSONS MAY ATTEND

LOT 1 LEGAL DESCRIPTION

A PARCEL OF LAND IN THE CITY OF FORT LUPTON, COLORADO LOCATED IN THE SW1/4, SE1/4, SECTION 17, TOWNSHIP 1 NORTH, RANGE 66 WEST OF THE 6TH PRINCIPAL MERIDIAN AND MORE PARTICULARLY DESCRIBED AS FOLLOWS:

LOT 1 TRANSWEST NORTH MINOR SUBDIVISION-FIRST AMENDMENT, CITY OF FORT LUPTON, COUNTY OF WELD, STATE OF COLORADO CONTAINING 38.242 ACRES MORE OR LESS.

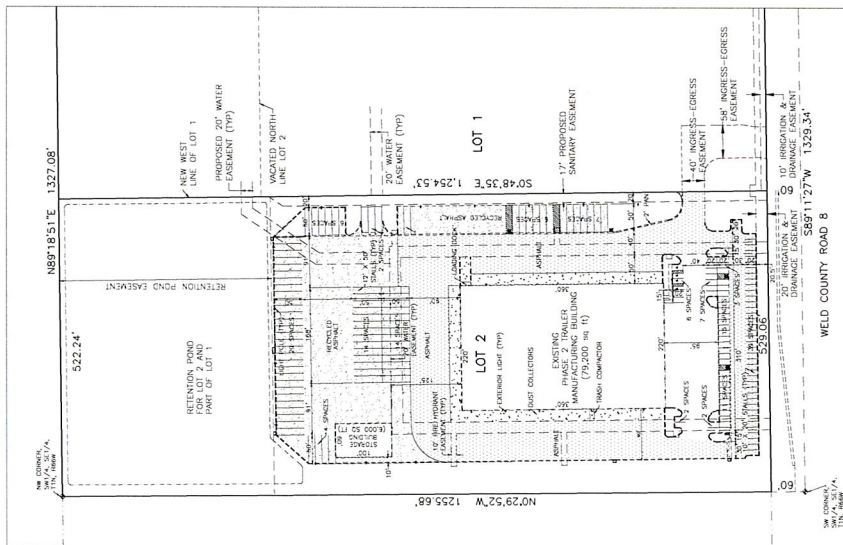
LOT 2 LEGAL DESCRIPTION

A PARCEL OF LAND IN THE CITY OF FORT LUPTON, COLORADO LOCATED IN THE SW1/4, SE1/4, SECTION 17, TOWNSHIP 1 NORTH, RANGE 66 WEST OF THE 6TH PRINCIPAL MERIDIAN AND MORE PARTICULARLY DESCRIBED AS FOLLOWS:

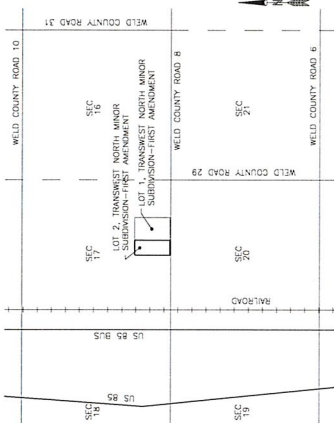
LOT 2, TRANSWEST NORTH MINOR SUBDIVISION-FIRST AMENDMENT, CITY OF FORT LUPTON, COUNTY OF WELD, STATE OF COLORADO CONTAINING 38.242 ACRES MORE OR LESS.

ADDITIONAL INFORMATION AND DOCUMENTS ON THIS APPLICATION CAN BE FOUND AT BIT.LY/FLDEVELOPMENT AND SCROLLING DOWN TO THE ROW TITLED: TRANSWEST TRUCK AND TRAILER PHASE 3 SITE PLANS AND AMENDED PLAT

TRANSWEST TRUCK AND TRAILER, PHASE 3
LOT 2, TRANSWEST NORTH MINOR SUBDIVISION—FIRST AMENDMENT
PART OF THE SW1/4, SE1/4, SECTION 17, TOWNSHIP 1 NORTH, RANGE 66 WEST
PROJECT NO. _____ & PLAN NO. _____



VICINITY MAP
1"=2000'



PROPERTY DESCRIPTION:
A PART OF LAND IN THE CITY OF FORT LUTON, COLORADO LOCATED IN THE SW1/4, SE1/4, SECTION 17, TOWNSHIP 1 NORTH, RANGE 66 WEST OF THE 6TH PRINCIPAL MERIDIAN AND MORE PARTICULARLY DESCRIBED AS FOLLOWS:
LOT 2, TRANSWEST NORTH MINOR SUBDIVISION—FIRST AMENDMENT, CITY OF FORT LUTON, COUNTY OF WELD, STATE OF COLORADO CONTAINING 38.242 ACRES MORE OR LESS.

OWNERS' APPROVAL:
KNOW ALL MEN BY THESE PRESENTS, THAT GEP INVESTMENTS, INC. BEING THE SOLE OWNER OF THE LAND DESCRIBED HEREIN, AND
KNOW ALL MEN BY THESE PRESENTS, THAT THE CITY OF FORT LUTON, COLORADO BEING THE SOLE OWNER OF THE LAND DESCRIBED HEREIN, AND
AND DEEDATION 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 _____, 2021.

STATE OF COLORADO } SS
COUNTY OF WELD }
THE FOREGOING INSTRUMENT WAS ACKNOWLEDGED BEFORE ME BY GEORGE EDGESS ON THIS ____ DAY OF _____, 2021. WITNESS MY HAND AND SEAL
MY COMMISSION EXPIRES: _____

CITY ENGINEER'S APPROVAL
APPROVED THIS ____ DAY OF _____, 2021
CITY WATER AND SEWER DEPARTMENT APPROVAL
APPROVED THIS ____ DAY OF _____, 2021
CITY ADMINISTRATOR'S APPROVAL
APPROVED THIS ____ DAY OF _____, 2021
PLANNING COMMISSION RECOMMENDATION
APPROVED THIS ____ DAY OF _____, 2021
BY RESOLUTION NO. _____

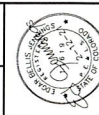
NOTARY PUBLIC
CITY ENGINEER
DIRECTOR OF PUBLIC WORKS
CITY ADMINISTRATOR
CHARTERPERSON, FORT LUTON PLANNING COMMISSION
MAYOR'S CERTIFICATE
THE IS TO CERTIFY THAT A PLAT OF THE ABOVE-DSCRIBED PROPERTY WAS APPROVED BY RESOLUTION NO. _____ OF THE CITY OF FORT LUTON,
PASSED AND ADOPTED ON THE ____ DAY OF _____, A.D. 2021, AND THAT THE MAYOR OF THE CITY OF FORT LUTON, AS AUTHORIZED BY SAID RESOLUTION,
HEREBY ACKNOWLEDGES AND ADOPTS THE SAID PLAT UPON WHICH THIS CERTIFICATE IS ENDORSED FOR ALL
PURPOSES INDICATED HEREON.

NOTES:
1. THE PROPERTY SHALL BE MAINTAINED TO THE CURB OR
ROADWAY IF NO CURB EXISTS.
2. THE PROPERTY SHALL BE MAINTAINED TO THE CURB OR
ROADWAY AT THE FOREMOST UNUSUALLY DATE.
3. ANY ABOVE GROUND FUEL TANKS REQUIRE A SEPARATE
SPECIAL USE PERMIT PRIOR TO PLACEMENT AND ANY
SPECIAL USE PERMIT SHALL BE SUBMITTED TO THE PLANNING
DEPARTMENT.
4. LIGHTING ON THE SITE SHALL BE MAINTAINED SO THAT
LIGHT IS DIRECTED DOWNWARD AND SHALL NOT SPILL ONTO
ADJACENT PROPERTIES.

GENERAL LEGEND
EXISTING FIRE HYDRANT
EXISTING WATER MAIN VALVE
EXISTING STORM INLETS
EXISTING LIGHT PELLETS
EXISTING LIGHT PELLETS
PROPERTY LINE
EASEMENT EDGE
SURFACE MATERIAL LEGEND
RECYCLED ASPHALT
ASPHALT PAVEMENT
CONCRETE PAVEMENT

ED JENNINGS P.E. PLS.
CIVIL ENGINEER
P.O. BOX 200663
DENVER, CO 80202-0663
(303)555-1987 FAX
(303)555-1987 CELL
EDJENNINGS@GMAIL.COM

BEFORE YOU DIG
CALL 811
FOR BURIED CABLE LOCATIONS
1-800-832-8272
1-800-832-8272
1-800-832-8272



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