STORMWATER MANAGEMENT PLAN (SWMP)
STORMWATER BEST MANAGEMENT PRACTICES

For:

STERLING RANCH
(OFF-SITE SANITARY SEWER FORCE MAIN)

Prepared For:

SR Land, LLC

20 Boulder Crescent
Colorado Springs, CO 80903
Contact: Chaz Collins
719-491-8717

Prepared by:

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102 E. Pikes Peak, Suite 500
Colorado Springs, CO 80903

Job. No. 90-012 Project #PPR-00-000

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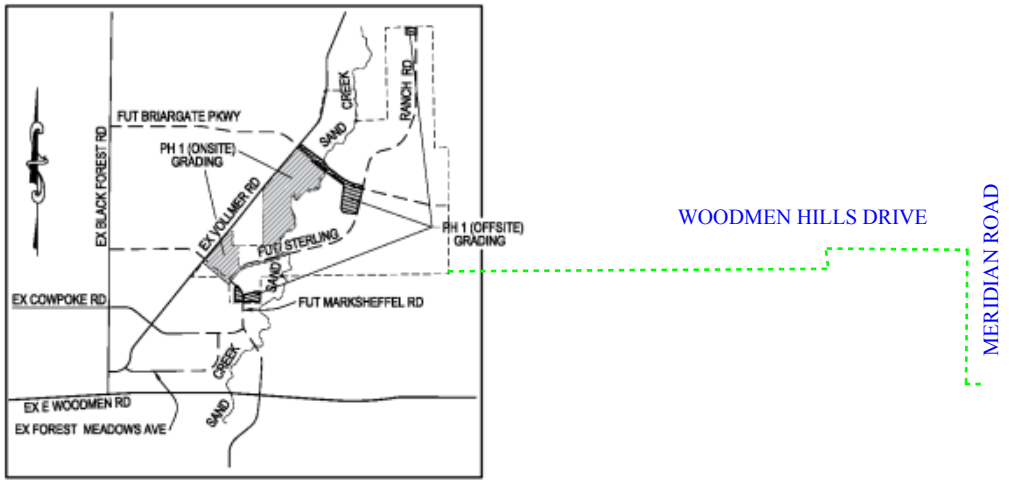
STORMWATER MANAGEMENT PLAN (SWMP)

General Site Description

Sterling Ranch is composed of approximately 1408.4 acres located to the north and east of Colorado Springs. The Off-Site Sanitary Sewer Force Main installation will impact approximately 8.0 acres along the 14,122 Linear feet. The areas of disturbances is limited to the alignment corridor. The primary area of disturbance is as follows:

1) Utility Installation and Reseeding along the alignment corridor from the southeast corner of Sterling Ranch, along the right-of-way in Woodmen Hills Drive to Meridian Road, thence along the western edge of right-of-way of Meridian Road southerly to a bored crossing of Meridian Road, to the ultimate discharge manhole.

The alignment is located in Sections 34, 35, 36, Township 12 South. and Section 1, Township 13 South, Range 65 West of the 6th P.M., in El Paso County, Colorado.



Narrative Description of Site Activities:

The purpose of the Early Grading and Erosion Control Plan for Sterling Ranch - Off-Site Sanitary Sewer Force Main, is to install an 8" & 10" pipe to convey effluent from the Sterling Ranch Lift Station to the Meridian Service Metropolitan District. Specific construction activities will include clearing and grubbing, trench excavation and backfill, temporary stabilization, and utility installation and permanent stabilization. Disturbance and grading of the site in the proposed manner shown within the plans will not adversely impact adjacent or downstream properties. Implementation of the BMP's proposed on the plan will serve to maintain or improve the water quality of the site runoff in a manner that is safe and satisfies the requirements set forth in the El Paso county Drainage Criteria Manual.

Phasing Plan:

Not Applicable.

Proposed Sequence for Major Activities:

Installations of BMPs are staged in order to minimize the potential for pollutants in the stormwater discharge. A preconstruction meeting is necessary prior to commencement of BMP installation. The following stages will be used: establishment of perimeter controls, installation of temporary BMPs during soil disturbance and then finally installation of permanent controls. Descriptions of some of the available BMPs are listed in below stages:

Only clearing necessary for the installation of perimeter controls should be employed in the first stage of temporary BMPs installation. Silt fence and vehicle tracking should be installed as shown on the Grading & Erosion Control Plan. At this time, the El Paso County inspector should be notified to schedule an initial inspection. Rough grading of the site will precede construction of proposed underground utilities.

Once utilities and temporary storm sewer infrastructure have been constructed, installation of temporary BMPs will commence. Temporary BMPs for this site consist of Inlet Protection, Check Dams, and Straw Bale Barriers. Locations for temporary earthwork stockpiles will also be established. Once these locations have been established, they should be added and denoted on the copy of the plan that will be kept with the site administrator.

The final stage is the installation of permanent BMPs where no further disturbance is anticipated. Upon completion of the permanent BMPs and all grading activities are completed, all disturbed areas not sodded or developed will be mulched and reseeded with native seed mix and may be watered until vegetative cover has been fully re-instated. At this point, the person responsible for inspection and maintenance can begin to address requirements for final stabilization. See construction details for installation and maintenance.

Soils

The soils will vary along the pipe installation corridor. The majority of the soil will be excavated and backfilled in the same day of construction. Therefore, the effects of the remaining disturbed area shall be the replacement with native topsoil. The topsoil can then be reseeded to accomplish growth of vegetation for soil stability and to prevent erosion.

Water Quality

There are no existing or proposed full spectrum detention, or water quality ponds directly adjacent to the utility alignment corridor. Therefore, extreme care shall be given to prevent sediment leaving the area of construction. The methods for this are stated further in this report.

Narrative Description of BMP Control Measures

Installations of BMPs are staged in order to minimize the potential for pollutants in the stormwater discharge. The following stages will be used: establishment of perimeter controls, installation of temporary BMPs during soil disturbance and then finally installation of permanent controls. Descriptions of some of the available BMPs are listed in below stages:

Only clearing necessary for the installation of perimeter controls should be employed in the first stage of temporary BMPs installation. Silt fence and vehicle tracking should be installed as shown on the Grading & Erosion Control Plan. At this time, the El Paso County inspector should be notified to schedule an initial inspection. Rough grading of the site will precede construction of proposed underground utilities.

Once utilities and storm drain infrastructure have been constructed, installation of temporary BMPs will commence. Temporary BMPs for this site consist of Inlet Protection. Locations for a concrete washout area and temporary stockpile location will also be established. These locations are likely to be different than what is shown on the Grading and Erosion Control Plan that accompanies this report. Once these locations have been established, they should be added and denoted on the copy of the plan that will be kept with the site administrator.

The final stage is the installation of permanent BMPs where no further disturbance is anticipated. Upon completion of the permanent BMPs and all grading activities are completed, all disturbed areas not sodded or developed will be mulched and reseeded with native seed mix and may be watered until vegetative cover has been fully re-instated. At this point, the person responsible for inspection and maintenance can begin to address requirements for final stabilization. See construction details for installation and maintenance.

Specifically, the proposed project will use silt fence, a vehicle tracking control pad, concrete washout area, inlet protection, mulching and reseeding as well as erosion control matting to mitigate the potential for erosion across the site.

Timing Schedule

Anticipated Starting and Completion Time Period of Grading Activities:
April 2019 - May 2021

Expected Date on Which The Final Stabilization Will Be Completed:
October 2021

Areas of Disturbance

Total subject property site acreage: **4.86 AC** (14,122 LF x 15' Feet)
Total disturbed area of subject property: **~8 AC**

Permanent Stabilization

Final stabilization is reached when all soil-disturbing activities at the site have been completed, and uniform vegetative cover has been established by drill seeding and crimping with a density of at least 70% of pre-disturbance levels or equivalent permanent physical erosion reduction methods have been employed. The CDPHE Water Quality Division may, after consultation with the permittee and upon good cause, amend the final stabilization criteria for specific operations. At this time, the El Paso County inspector should be notified to schedule a final inspection. The conditions of the SWMP and General Permit for Stormwater Discharges associated with Construction Activity will remain in effect until Final Stabilization is achieved and a notice of inactivation is sent by the applicant to CDPHE Stormwater Quality Division. All pertinent records must be kept on file for at least 3 years from the date the site is finally stabilized.

Owner Inspections and Maintenance of BMP's

1. Make thorough inspection of the stormwater management system at least every 14 days.
2. Make thorough inspection of the stormwater management system after each precipitation event that causes runoff.
3. If any deficiencies are noted, they must be corrected immediately after being noted.
4. Records of the site inspections or modifications must be kept at the site unless alternate place is approved by the El Paso County inspector and must be made available upon request.
5. Inspections must take place where construction activity is complete, but lot is not sold.
6. Monthly inspections must take place on site where construction activity is complete, but vegetative cover is still being established.

Soil Borings I Test and Groundwater

A Geotechnical Investigation has been completed for the overall Sterling Ranch development which is inclusive of Homestead at Sterling Ranch Filing No.2 site, titled Geologic Hazard Evaluation Sterling Ranch Residential, EL Paso County Colorado, by CTL Thompson Inc. dated January 20, 2009.

Site Run-Off Characteristics

The site runoff coefficients are:	Minor Storm	Major Storm
-Historic existing Conditions	0.09	0.36
-Roofs, sidewalks, paved areas	0.90	0.96
-Landscaped and undeveloped areas	0.25	0.35

STORMWATER MANAGEMENT PLAN

Introduction

To: Site Inspector responsible for all Colorado Department of Public Health and Environment and El Paso County Requirements:

The following stormwater management plan (SWMP) is a required item under the Construction Stormwater Discharge Permit. The primary goal for a SWMP to is to improve water quality by reducing pollutants in to stormwater discharges. Construction dewatering is a separate issue, and must be covered by the CDPHE Stormwater Quality Division's general permit for construction dewatering (regardless of the size of the construction project). Stormwater that mixes with ground water in an excavation is subject to the controls of a Construction Dewatering Permit. It is assumed that the SWMP will be completed and implemented at the time the project breaks ground, and will be revised if necessary as construction proceeds. This document must be kept at the construction site at all times and be made available to the public and any representative of any Water Quality Control Divisions if requested. Inspection guidance can be found at www.cdphe.state.co.us/and El Paso County and City of Colorado Springs Storm Drainage Design Criteria. The inspections should be made at least every 14 days and after any precipitation or snowmelt event that causes surface erosion. El Paso County requires that the inspector must be contacted 48 hours prior to initial and final inspections. An inspection log entry should be completed with each inspection performed. The inspection log should be kept with the SWMP. The conditions of the SWMP and General Permit for Stormwater Discharges associated with the construction activity will remain in effect until final stabilization is achieved, and a notice of inactivation is sent to CDPHE Stormwater Quality Division. All pertinent records must be kept for at least 3 years from date the site is stabilized or sold.

Floodplain Statement

No portion of this alignment (Off-Site Sterling Ranch) lies within a designated F.E.M.A. floodplain as determined by the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Panel No. 08041C0535 G, effective date December 7, 2018 and revised to reflect LOMR, 08-08-O541P, dated July 23, 2009. An annotated FIRM Panel is included in the Appendix.

Receiving Water Description

The site is located with the East Fork of the Sand Creek Drainage Basin, & Falcon Drainage Basin.

Existing Vegetation Description

Off-Site Sterling Ranch Sanitary Sewer Force Main is proposed within developed and undeveloped areas. The undeveloped areas contain sparse vegetation, consisting of native grasses. The developed areas that the alignment will cross will contain sparse vegetation to dense residential landscaping. The alignment is proposed outside of the asphalt along Woodmen Hills Drive and Meridian Road, mostly in the roadside ditches. These areas have varying types of vegetation. Replacement of the vegetation post construction should be in-kind or better than the pre-construction conditions.

Potential Pollution Sources

Construction activities that will take place at this site may have an impact on the stormwater quality. These include, but are not limited to, portable toilets, materials storage, vehicle fueling, maintenance and vehicle tracking, dust, waste piles and dumpsters. The location of any of these activities not included on the initial site map should be added along with a description of the measures used to prevent the discharge of these materials from the site. See construction details for installation and maintenance.

Anticipated Non-Stormwater Discharges

Non-stormwater discharges are caused by activities other than direct runoff from precipitation events. These include, but are not limited to natural springs. Any non-stormwater discharges that are not included in the initial map should be added along with a description of measures used to handle it.

EROSION SEDIMENT CONTROLS

Proposed Sequence of Construction Activities

1. Notify the inspector for initial inspection.
2. Clearing for necessary for perimeter controls.
3. Construct vehicle traffic control pad at entrance/exit of construction site.
4. Install lot perimeter controls, including silt fence, delineating project site as indicated on Site Map.
5. Complete remaining clearing and grubbing for project area. Install additional BMPs, as indicated on Site Map.
6. Final grade site as indicated on Site Map.
7. Achieve Final Stabilization, as outlined in SWMP. Send inactivation notice to CDPHE.
8. See Construction Details for BMP Installation and Maintenance.

Any stockpile areas are to be contained with silt fence, or other acceptable measures to prevent erosion and sediment from leaving the area. All BMP's that may be in place need to be inspected and cleaned if sediment should leave the site and enter the streets. Erosion control measures shall be implemented in a manner that will protect properties and public facilities from the adverse effect of erosion and sedimentation as a result of construction and earthwork activities. The following practices are to be implemented for this site:

Structural Practices

In areas of sheet flow running off-site and at the top and bottom of steep slopes, silt fence will be used to trap sediment. Silt fence should be placed on the contour and in areas where the tributary area is less than one-quarter acre per 100' of silt fence. A vehicle traffic control pad will be installed at the entrance/exit of the site to reduce sediment tracking off-site.

Practices may include, but are not limited to straw bales, wattles/sediment control logs, silt fences, earth dikes, drainage swales, sediment traps, subsurface drains, pipe slope drains, inlet protection, outlet protection, gabions, and temporary or permanent sediment basins. All roads will be inspected to

ensure that sediment from on-site construction activity is not being discharged with the stormwater. Sediment and debris that have been tracked off-site should be removed daily by shoveling or sweeping. See construction details for installation and maintenance.

Non-Structural Practices

Surface roughening may be used to reduce the amount of runoff and wind erosion from any given areas. Once the existing vegetation is cleared, watering should occur to help control fugitive dust. Disturbed areas where work is temporarily halted shall be temporarily stabilized within 21 calendar days after activity has ceased unless work is to be resumed within 30 calendar days after the activity has ceased. Other Non-Structural Practices may include soils erosion control measures for all slopes, channels, ditches, or any disturbed land area shall be completed within 21 calendar days after final grade, or final earth disturbance, has been completed. Disturbed areas and stockpiles, which are not at final grade but will remain dormant for longer than 30 days, shall also be mulched within 21 days after interim grading. An area that is going to remain in an interim state for more than 60 days shall also be seeded. All temporary soil erosion control measures and BMPs shall be maintained until permanent soil erosion control measures are implemented. See construction details for installation and maintenance.

Materials Handling and Spill Practices

Any substances with potential to contaminate either the ground or ground surface water shall be cleaned up immediately after discovery or contained until appropriate cleanup methods can be employed. Manufacture's recommended methods for clean up shall be followed, along with proper disposal methods. Any discharge of hazardous materials must be handled in accordance with the Divisions Notification Requirement. All waste and debris created by construction activities at the site or removed from the site shall be disposed of in compliance with all laws, regulations and ordinances of the federal, state and local agencies. See construction details for Materials Handling and Spills.

Potential Pollution Sources

Construction activities that will take place at this site may have an impact on the stormwater quality. These include, but are not limited to, portable toilets, materials storage, vehicle fueling, maintenance and vehicle tracking, dust, waste piles and dumpsters. The location of any of these activities not included on the initial site map should be added along with a description of the measures used to prevent the discharge of these materials from the site. See construction details for installation and maintenance.

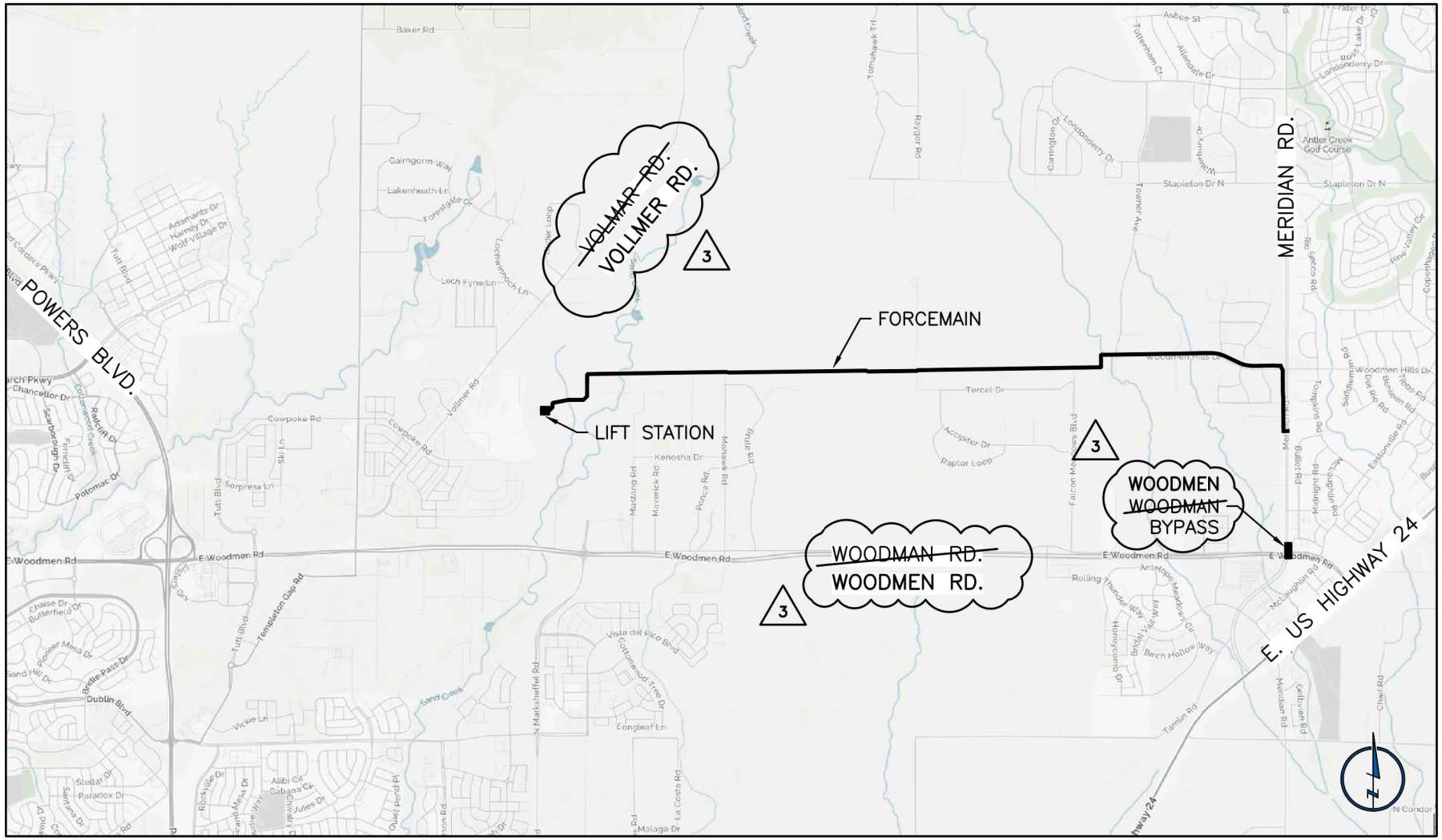
Potential Soil Erosion

The proposed onsite construction activities anticipate the potential for soil erosion. Onsite stormwater BMP management facilities are proposed to minimize and aid in soil erosion

APPENDICES

COPY OF CDPHE APPLICATION

VICINITY MAP



LOCATION MAP
N.T.S.

STATE OF COLORADO

COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT
Dedicated to protecting and improving the health and environment of the people of Colorado

Water Quality Control Division
4300 Cherry Creek Drive South
WQCD-WQPS-B2
Denver, CO 80246-1530
(303) 692– 3500 **www.coloradowaterpermits.com**

For Agency Use Only
Permit Number Assigned
COR03-_____
Date Received ____/____/____ (MM DD YYYY)

COLORADO DISCHARGE PERMIT SYSTEM (CDPS)

STORMWATER DISCHARGE ASSOCIATED WITH CONSTRUCTION ACTIVITIES APPLICATION

PHOTO COPIES, FAXED COPIES, PDF COPIES OR EMAILS WILL NOT BE ACCEPTED.

Please print or type. Original signatures are required.
All items must be completed accurately and in their entirety for the application to be deemed complete. Incomplete applications will not be processed until all information is received which will ultimately delay the issuance of a permit. If more space is required to answer any question, please attach additional sheets to the application form. Applications must be submitted by mail or hand delivered to:

Colorado Department of Public Health and Environment
Water Quality Control Division
4300 Cherry Creek Drive South
WQCD-WQPS-B2
Denver, CO 80246-1530

Any additional information that you would like the Division to consider in developing the permit should be provided with the application. Examples include effluent data and/or modeling and planned pollutant removal strategies.

HOW TO COMPLETE THIS APPLICATION

1. Online via web browser. You must use Internet Explorer (version 8 and above). All other browsers disable the electronic submission features.
OR
2. Download and save this form to your computer. Then open Adobe Reader (or Acrobat), select File, then Open and navigate to where the form is saved. This is the best option if using a Mac computer (Do not use the Mac Preview program).

PERMIT INFORMATION

Reason for Application: ☑ NEW CERT ☐ RENEW CERT EXISTING CERT# _____

Applicant is: ☐ Property Owner ☑ Contractor/Operator

A. CONTACT INFORMATION—NOT ALL CONTACTS MAY APPLY *indicates required

*** PERMITTEE (if more than one please add additional pages)**

*** ORGANIZATION FORMAL NAME:** C & C Land, LLC

1) * PERMITTEE CONTACT the person **authorized to sign and certify** the permit application.
This person receives all permit correspondences and is the person **responsible** for ensuring compliance with the permit.

Responsible Person (Title): Contractor

Currently Held By (Person): FirstName: Chaz LastName: Collins

Telephone: 719-471-1742 Email Address: candclandllc@aol.com

Organization: C & C Land, LLC

Mailing Address: 20 Boulder Crescent, Suite 200

City: Colorado Springs State: CO Zip Code: 80903

This form must be signed by the Permittee (listed in item 1) to be considered complete.
Per Regulation 61 In all cases, it shall be signed as follows:

In the case of corporations, by a responsible corporate officer. For the purposes of this section, the responsible corporate officer is responsible for the overall operation of the facility from which the discharge described in the application originates.
In the case of a partnership, by a general partner.
In the case of a sole proprietorship, by the proprietor.
In the case of a municipal, state, or other public facility, by either a principal executive officer or ranking elected official.

2) **DMR COGNIZANT OFFICIAL (i.e. authorized agent)** the person or position authorized to **sign and certify reports required by the Division** including Discharge Monitoring Reports *DMR's, Annual Reports, Compliance Schedule submittals, and other information requested by the Division. The Division will transmit pre-printed reports (ie. DMR's) to this person. If more than one, please add additional pages.

☑ Same as 1) Permittee

Responsible Person (Title): Contractor

Currently Held By (Person): FirstName: Chaz LastName: Collins

Telephone: 719-471-1742 Email Address: candclandllc@aol.com

Organization: C & C Land, LLC

Mailing Address: 20 Boulder Crescent, Suite 200

City: Colorado Springs State: CO Zip Code: 80903

Per Regulation 61 : All reports required by permits, and other information requested by the Division shall be signed by the permittee or by a duly authorized representative of that person. A person is a duly authorized representative only if:

i. The authorization is made in writing by the permittee.

ii. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a **named individual** or any individual occupying a **named position);** and

iii. The written authorization is submitted to the Division.

3) ***SITE CONTACT** local contact for questions relating to the facility & discharge authorized by this permit

☑ Same as 1) Permittee

Responsible Person (Title): Contractor

Currently Held By (Person): FirstName: Chaz LastName: Collins

Telephone: 719-471-1742 Email Address: candclandllc@aol.com

Organization: C & C Land, LLC

Mailing Address: 20 Boulder Crescent, Suite 200

City: Colorado Springs State: CO Zip Code: 80903

4) ***BILLING CONTACT** if different than the permittee.

☑ Same as 1) Permittee

Responsible Person (Title): Contractor

Currently Held By (Person): FirstName: Chaz LastName: Collins

Telephone: 719-471-1742 Email Address: candclandllc@aol.com

Organization: C & C Land, LLC

Mailing Address: 20 Boulder Crescent, Suite 200

City: Colorado Springs State: CO Zip Code: 80903

5) OTHER CONTACT TYPES (check below) Add pages if necessary:

Responsible Person (Title): _____

Currently Held By (Person): _____ LastName: _____

Telephone: _____ Email Address: _____

Organization: _____

Mailing Address: _____

City: _____ State: _____ Zip Code: _____

- ☐ Pretreatment Coordinator
- ☐ Property Owner
- ☐ Compliance Contact
- ☐ Environmental Contact
- ☐ Inspection Facility Contact
- ☐ Stormwater MS4 Responsible Person
- ☐ Biosolids Responsible Party
- ☐ Consultant
- ☐ Stormwater Authorized Representative
- ☐ Other: _____

B) PERMITTED PROJECT/FACILITY INFORMATION

Project/Facility Name: Sterling Ranch Off-Site Sanitary Sewer Force Main

Street Address or Cross Streets: North and East of the future intersection of Vollmer Road and Marksheffel Road

(e.g., "S. of Park St. between 5th Ave. and 10th Ave.", or "W. side of C.R. 21, 3.25 miles N. of Hwy 10"; A street name without an address, intersection, mile marker, or other identifying information describing the location of the project is not adequate. For **linear projects**, the route of the project should be described as best as possible with the location more accurately indicated by a map.)

City: N/E of Colorado Springs Zip Code: _____ County: EL Paso

Facility Latitude/Longitude - (approximate center of site to nearest 15 seconds using one of the following formats)

☐ Decimal Degrees

OR 001A Latitude _____ . _____ (Degrees (to 3 decimal places)) 001A Longitude _____ . _____ (Degrees (to 3 decimal places)) (e.g., 39.703°, 104.933°)

☑ Degrees, Minutes, Seconds

001A Latitude 38 (Degrees) ° 57 (Minutes) ' 47N (Seconds) " 001A Longitude 104 (Degrees) ° 40 (Minutes) ' 30W (Seconds) " e.g., 39°46'11"N, 104°53'11"W

For the approximate center point of the property, to the nearest 15 seconds. The latitude and longitude must be provided as either degrees, minutes, and seconds, or in decimal degrees with three decimal places. This information may be obtained from a variety of sources, including:

- **Surveyors or engineers** for the project should have, or be able to calculate, this information.
- EPA maintains a **web-based siting tool** as part of their Toxic Release Inventory program that uses interactive maps and aerial photography to help users get latitude and longitude. The siting tool can be accessed at **www.epa.gov/tri/report/siting_tool/index.htm**
- **U.S. Geological Survey topographical map(s)**, available at area map stores.
- Using a **Global Positioning System (GPS) unit** to obtain a direct reading.

***Note**: the latitude/longitude required above is not the directional degrees, minutes, and seconds provided on a site legal description to define property boundaries.*

C) MAP (Attachment) If no map is submitted, the permit will not be issued Facility Information

Map: Attach a map that indicates the site location and that CLEARLY shows the boundaries of the area that will be disturbed. Maps must be **no larger** than 11x17 inches.

D) LEGAL DESCRIPTION

Legal description: If subdivided, provide the legal description below, or indicate that it is not applicable (**do not** supply Township/Range/Section or metes and bounds description of site)

Subdivision(s): _____ Lot(s): _____ Block(s) _____

OR ☑ Not applicable (site has not been subdivided)

E) AREA OF CONSTRUCTION SITE

Total area of project site: 4.86 AC. Area of project site to undergo disturbance: ~8.0 AC

Note: aside from clearing, grading and excavation activities, disturbed areas also include areas receiving overburden (e.g., stockpiles), demolition areas, and areas with heavy equipment/vehicle traffic and storage that disturb existing vegetative cover

Total disturbed area of Larger Common Plan of Development or Sale, if applicable: not applicable

(i.e., total, including all phases, filings, lots, and infrastructure not covered by this application)

Provide both the total area of the construction site, and the area that will undergo disturbance, in acres. **Note:** aside from clearing, grading and excavation activities, disturbed areas also include areas receiving overburden (e.g., stockpiles), demolition areas, and areas with heavy equipment/vehicle traffic and storage that disturb existing vegetative cover (see construction activity description under the APPLICABILITY section on page 1). If the project is part of a **larger common plan of development or sale** (see the definition under the APPLICABILITY section on page 1), the disturbed area of the total plan must also be included.

F) NATURE OF CONSTRUCTION ACTIVITY

Check the appropriate box(s) or provide a brief description that indicates the general nature of the construction activities. (The full description of activities must be included in the Stormwater Management Plan.)

- ☐ Single Family Residential Development
- ☐ Multi-Family Residential Development
- ☐ Commercial Development
- ☐ Oil and Gas Production and/or Exploration (including pad sites and associated infrastructure)
- ☐ Highway/Road Development (not including roadways associated with commercial or residential development)
- ☑ Other—Description: Early Grading and Erosion Control Plan in preparation for Single Family Development

G) ANTICIPATED CONSTRUCTION SCHEDULE

Construction Start Date: June 2019 Final Stabilization Date: June 2022

- *Construction Start Date* - This is the day you expect to begin ground disturbing activities, including grubbing, stockpiling, excavating, demolition, and grading activities.
- *Final Stabilization Date* - in terms of permit coverage, this is when the site is finally stabilized. This means that all ground surface disturbing activities at the site have been completed, and all disturbed areas have been either built on, paved, or a uniform vegetative cover has been established with an individual plant density of at least 70 percent of pre-disturbance levels. **Permit coverage must be maintained until the site is finally stabilized. Even if you are only doing one part of the project, the estimated final stabilization date must be for the overall project.** If permit coverage is still required once your part is completed, the permit certification may be transferred or reassigned to a new responsible entity(s).

H) RECEIVING WATERS (If discharge is to a ditch or storm sewer, include the name of the ultimate receiving waters)

Immediate Receiving Water(s): Sand Creek

Ultimate Receiving Water(s): Fountain Creek

Identify the receiving water of the stormwater from your site. Receiving waters are any waters of the State of Colorado. This includes all water courses, even if they are usually dry. If stormwater from the construction site enters a ditch or storm sewer system, identify that system and indicate the ultimate receiving water for the ditch or storm sewer. **Note:** a stormwater discharge permit does not allow a discharge into a ditch or storm sewer system without the approval of the owner/ operator of that system.

I) SIGNATURE PAGE

1. **You may print and sign this document and mail the hard copy to the State along with required documents.**

OR

2. **Electronic Submission Signature**

You may choose to submit your application electronically, along with required attachments. To do so, click the SUBMIT button below which will direct you, via e-mail , to sign the document electronically using the DocuSign Electronic Signature process. Once complete, you will receive, again via e-mail, an electronically stamped Adobe pdf of this application. Print the signature page from the electronically stamped pdf, sign it and mail it to the WQCD Permits Section to complete the application process (address is on page 1 of the application).

- **The Division encourages use of the electronic submission of the application and electronic signature. This method meets signature requirements as required by the State of Colorado.**
- **The ink signed copy of the electronically stamped pdf signature page is also required. This requirement meets Federal EPA Requirements.**

Processing of the application will begin with the receipt of the valid electronic signature.

☑ **STORMWATER MANAGEMENT PLAN CERTIFICATION**

"I certify under penalty of law that a complete Stormwater Management Plan, as described in Appendix B of this application, has been prepared for my activity. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the Stormwater Management Plan is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for falsely certifying the completion of said SWMP, including the possibility of fine and imprisonment for knowing violations."

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."
"I understand that submittal of this application is for coverage under the State of Colorado General Permit for Stormwater Discharges Associated with Construction Activity **for the entirety of the construction site/project described and applied for, until such time as the application is amended or the certification is transferred, inactivated, or expired."** [Reg 61.4(1)(h)]

For Docusign
Electronic Signature _____ Ink Signature _____ Date: _____

Signature of Legally Responsible Person or Authorized Agent (submission must include original signature)

Chaz Collins	Contractor
Name (printed)	Title

This form must be signed by the Permittee to be considered complete. **Per Regulation 61** In all cases, it shall be signed as follows:

a) In the case of corporations, by a responsible corporate officer. For the purposes of this section, the responsible corporate officer is responsible for the over all operation of the facility from which the discharge described in the application originates.
b) In the case of a partnership, by a general partner.
c) In the case of a sole proprietorship, by the proprietor.
d) In the case of a municipal, state, or other public facility, by either a principal executive officer or ranking elected official

3rd Party Preparer: If this form was prepared by an authorized agent on behalf of the Permittee, please complete the fields below.

Darin L. Moffett	darin@mscivil.com
Preparer Name (printed)	Email Address

DO NOT INCLUDE A COPY OF THE STORMWATER MANAGEMENT PLAN
DO NOT INCLUDE PAYMENT—AN INVOICE WILL BE SENT AFTER THE CERTIFICATION IS ISSUED.

	Attach Map
	Attach File
	Attach File
	Attach File
	Attach File

GRADING, EROSION, STORMWATER
INSPECTION CHECKLIST

Appendix C Inspection Checklist – Grading Erosion, and Stormwater Quality Controls

CITY OF COLORADO SPRINGS

DATE/TIME:
INSPECTOR:
TYPE OF INSPECTION: Self-Monitoring_____ Initial _____ Compliance_____ Follow-Up_____ Reconnaissance_____ Complaint_____ Final____

SITE:	DATE OF PERMIT:
ADDRESS:	
CONTRACTOR: CONTACT: PHONE:	OWNER/OWNER'S REPRESENTATIVE: CONTACT: PHONE:
STAGE OF CONSTRUCTION: Initial BMP Installation/Prior to Construction_____ Clearing & Grubbing_____ Rough Grading_____ Finish Grading_____ Utility Construction_____ Building Construction_____ Final Stabilization_____	

OVERALL SITE INSPECTION	YES/NO/N.A.	REMARKS/ACTIONS
Is there any evidence of sediment leaving the construction site? If so, note areas.		
Have any adverse impacts such as flooding, structural damage, erosion, spillage, or accumulation of sediment, debris or litter occurred on or within public or private property, wetlands or surface waters –to include intermittent drainageways and the City's stormwater system (storm sewers, gutters, ditches, etc.)?		
Are the BMPs properly installed and maintained?		
Have the BMPs been placed as shown on approved plans?		
Are the BMPs functioning as intended?		
Is work being done according to approved plans and any phased construction schedule?		
Is the construction schedule on track?		
Are drainage channels and outlets adequately stabilized?		
Is there any evidence of discharges or spills of fuels, lubricants, chemicals, etc.?		

BMP MAINTENANCE CHECKLIST	YES/NO/N.A.	REMARKS/ACTIONS NECESSARY
SURFACE ROUGHENING Is the roughening consistent/uniform on slopes?? Any evidence of erosion?		
TEMPORARY SEEDING Are the seedbeds protected by mulch? Has any erosion occurred in the seeded area? Any evidence of vehicle tracking on seeded areas?		
TEMPORARY SWALES Has any sediment or debris been deposited within the swales? Have the slopes of the swale eroded or has damage occurred to the lining? Are the swales properly located?		
VEHICLE TRACKING Is gravel surface clogged with mud or sediment? Is the gravel surface sinking into the ground? Has sediment been tracked onto any roads and has it been cleaned up? Is inlet protection placed around curb inlets near construction entrance?		
OTHER		

FINAL INSPECTION CHECKLIST	YES/NO/N.A.	REMARKS/ACTIONS NECESSARY
Has all grading been completed in compliance with the approved Plan, and all stabilization completed, including vegetation, retaining walls or other approved measures?		
Has final stabilization been achieved – uniform vegetative cover with a density of at least 70 percent of pre-disturbance levels, and cover capable of adequately controlling soil erosion; or permanent, physical erosion methods?		
Have all temporary measures been removed?		
Have all stockpiles, construction materials and construction equipment been removed?		
Are all paved surfaces clean (on-site and off-site)?		
Has sediment and debris been removed from drainage facilities (on-site and off-site) and other off-site property, including proper restoration of any damaged property?		
Have all permanent stormwater quality BMPs been installed and completed?		

ADDITIONAL COMMENTS:

The items noted as needing action must be remedied no later than _____. The contractor shall notify the inspector when all the items noted above have been addressed.

By signing this inspection form, the owner/owner's representative and the contractor acknowledge that they have received a copy of the inspection report and are aware it is their responsibility to take corrective actions by the date noted above. Failure to sign does not relieve the contractor and owner/owner's representative of their responsibility to take the necessary corrective action and of their liability for any damages that have occurred or may occur.

INSPECTOR'S SIGNATURE:	DATE:
OWNER/OWNER'S REPRESENTATIVE SIGNATURE:	DATE:
CONTRACTOR'S SIGNATURE:	DATE:

SPILL CLEANUP INSTRUCTIONS AND REPORT FORM

involving a radioactive or infectious material, or there is a release of a marine pollutant.

Spills and incidents that have or may result in a spill along a highway must be reported to the nearest law enforcement agency immediately. The Colorado State Patrol and CDPHE must also be notified as soon as possible. In the event of a spill of hazardous waste at a transfer facility, the transporter must notify CDPHE within 24 hours if the spill exceeds 55 gallons or if there is a fire or explosion.

The National Response Center should be notified as soon as possible after discovery of a release of a hazardous liquid or carbon dioxide from a pipeline system if a person is killed or injured, there is a fire or explosion, there is property damage of $50,000 or more, or any nearby water body is contaminated.

The National Response Center and the Colorado Public Utilities Commission Gas Pipeline Safety Section must be notified as soon as possible, but not more than two hours after discovery of a release of gas from a natural gas pipeline or liquefied natural gas facility if a person is killed or injured, there is an emergency shutdown of the facility, or there is property damage of $50,000 or more. The Colorado Public Utilities Commission should also be notified if there is a gas leak from a pipeline, liquefied natural gas system, master meter system or a propane system that results in the evacuation of 50 or more people from an occupied building or the closure of a roadway.

Oil and Gas Exploration

All Class I major events on federal lands, including releases of hazardous substances in excess of the CERCLA reportable quantity and spills of more than 100 barrels of fluid and/or 500 MCF of gas released, must be reported to the Bureau of Land Management (BLM) immediately. Spills of oil, gas, salt water, toxic liquids and waste materials must also be reported to the BLM and the surface management agency.

Spills of exploration and production (E&P) waste on state or private lands in excess of 20 barrels, and spills of any size that impact or threaten to impact waters of the state, an occupied structure, or public byway must be reported to the Colorado Oil and Gas Conservation Commission as soon as practicable, but not more than 24 hours after discovery. Spills of any size that impact or threaten to impact waters of the state must be reported to CDPHE immediately. Spills that impact or threaten to impact a surface water intake must be reported to the emergency contact for that facility immediately after discovery. Spills of more than five (5) barrels of E&P waste must be reported in writing to the Oil and Gas Conservation Commission within 10 days of discovery.

REPORTING NUMBERS

National Response Center (24-hour)
1-800-424-8802

CDPHE Colorado Environmental Release and Incident Reporting Line (24-hour)
1-877-518-5608

Radiation Incident Reporting Line (24-hour)
303-877-9757

Colorado State Patrol (24-hour)
303-239-4501

Division of Oil and Public Safety
(business hours)
303-318-8547

Oil and Gas Conservation Commission
(business hours)
303-894-2100

Colorado Public Utilities Commission Gas Pipeline Safety Section (business hours)
303-894-2851

Local Emergency Planning Committees
(to obtain list, business hours)
720-852-6603

Colorado Department of Public Health and Environment

Environmental Spill Reporting

Colorado Department of Public Health and Environment
4300 Cherry Creek Drive South
Denver, CO 80246-1530

http://www.cdphe.state.co.us

January 2009

When a release of a hazardous material or other substance occurs to the environment, there are a number of reporting and notification requirements that must be followed by the company or individual responsible for the release. Most spills are covered by more than one reporting requirement, and **all** requirements must be met. In addition to verbal notification, written reports are generally required. This brochure briefly explains the major requirements. A more detailed description is provided in the "Reporting Environmental Releases in Colorado" Guidance Document, available on the web.

Releases that must be reported to the Colorado Department of Public Health and Environment (CDPHE) may be reported to the Colorado Environmental Release and Incident Reporting Line.

ENVIRONMENTAL SPILL REPORTING

CERCLA, EPCRA and RCRA

The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and the Emergency Planning and Community Right-to-Know Act (EPCRA) require that a release of a reportable quantity or more of a hazardous substance to the environment be reported immediately to the appropriate authorities when the release is discovered.

Under CERCLA, reportable quantities were established for hazardous substances listed or designated under other environmental statutes. These include:

- all hazardous air pollutants (HAPs) listed under Section 112(b) of the Clean Air Act.
- all toxic pollutants designated under Section 307(a) or Section 311(b)(2)(A) of the Clean Water Act.
- all Resource Conservation and Recovery Act (RCRA) characteristic and listed hazardous wastes.
- any element, compound, or substance designated under Section 102 of CERCLA.

EPCRA established a list of extremely hazardous substances (EHS) that could cause serious irreversible health effects from accidental releases. Many substances appear on both the CERCLA and EPCRA lists. EPCRA extremely hazardous substances that are also CERCLA hazardous substances have the same reportable quantity (RQ) as under CERCLA. EPCRA extremely hazardous substances that are not listed under CERCLA have a reportable quantity that is equal to their threshold planning quantity (TPQ). A list of CERCLA reportable quantities is included in 40 CFR Section 302.4. A list of EPCRA threshold planning quantities is included in 40 CFR Part 355 Appendices A & B.

CERCLA-reportable releases must be reported immediately to the National Response Center (NRC), while EPCRA-reportable releases must be reported immediately to the National Response Center, the State Emergency Response Commission (SERC) and the affected Local Emergency Planning Committee (LEPC). If the release is an EPCRA extremely hazardous substance, but not a CERCLA hazardous substance, and there is absolutely no potential to affect off-site persons, then only the State Emergency Planning Commission (represented by CDPHE for reporting purposes) and the Local Emergency Planning Committee need to be notified.

In the case of a release of hazardous waste stored in tanks, RCRA-permitted facilities and large quantity generators must also notify CDPHE within 24 hours of any release to the environment that is greater than one (1) pound.

Radiation Control

Each licensee or registrant must report to the Radiation Incident Reporting Line in the event of lost, stolen or missing licensed or registered radioactive materials or radiation machines, releases of radioactive materials, contamination events, and fires or explosions involving radioactive materials. Releases of radionuclides are reportable under CERCLA.

Clean Water Act

The Clean Water Act requires the person in charge of a facility or vessel to immediately report to the National Response Center all discharges of oil or designated hazardous substances to water. Oil means oil of any kind or form. Designated hazardous substances are included in the CERCLA list.

The Clean Water Act also requires that facilities with a National Pollutant Discharge Elimination System (NPDES) permit report to the National Response Center within 24 hours of becoming aware of any unanticipated bypasses or upsets that cause an exceedance of the effluent limits in their permit and any violations of their maximum daily discharge limits for pollutants listed in their permit.

A release of any chemical, oil, petroleum product, sewage, etc., which may enter waters of the state of Colorado (which include surface water, ground water and dry gullies and storm sewers leading to surface water) must be reported immediately to CDPHE. Any accidental discharge to the sanitary sewer system must be reported immediately to the local sewer authority and the affected wastewater treatment plant. For additional regarding releases to water, please see "Guidance for Reporting Spills under the Colorado Water Quality Control Act and Colorado Discharge Permits" at http://www.cdphe.state.co.us/op/wqcc/Resources/Guidance/spillguidance.pdf.

Clean Air Act

Hazardous air pollutants (HAPs) are designated as hazardous substances under CERCLA. If a facility has an air permit but the permit does not allow for or does not specify the release of a substance, or if the facility does not have an air permit, then all releases in excess of the CERCLA / EPCRA reportable quantity for that substance must be reported to the National Response Center and CDPHE. If the facility releases more of a substance than is allowed under its air permit, the facility must also report the release. Discharges of a substance that are within the allowable limits specified in the facility's permit do not need to be reported.

Regulated Storage Tanks

Owners and operators of regulated storage tank systems must report a release or suspected release of regulated substances to the Division of Oil and Public Safety at the Colorado Department of Labor and Employment within 24 hours. Under this program, the reportable quantity for petroleum releases is 25 gallons or more, or any amount that causes a sheen on nearby surface water. Spills of less than 25 gallons of petroleum must be immediately contained and cleaned up. If cleanup cannot be accomplished within 24 hours, the Division of Oil and Public Safety must be notified immediately.

Spills of hazardous substances from tanks in excess of the CERCLA or EPCRA reportable quantity must be reported immediately to the National Response Center, CDPHE and the local fire authority, and to the Division of Oil and Public Safety within 24 hours.

Transportation and Pipelines

The person in physical possession of a hazardous material must notify the National Response Center as soon as practical, but not to exceed 12 hours after the incident, if as a direct result of the hazardous material, a person is killed or injured, there is an evacuation of the general public lasting more than an hour, a major transportation artery is shut down for an hour or more, the flight pattern of an aircraft is altered, there is fire, spillage or suspected contamination

Colorado Water Quality Control Division

WATER QUALITY CONTROL DIVISION

Policy No: WQE-10
Initiated By: Dave Akers
Approved By:
Effective Date: 3/1/08
Revision No.:
Revision Date:

Guidance for Reporting Spills under the Colorado Water Quality Control Act and Colorado Discharge Permits

I. Purpose

To provide guidance on applicable Colorado reporting requirements pursuant to § 25-8-601(2), C.R.S., that pertains to spills or discharges that may cause pollution of State waters. This guidance does not relieve an entity of any other statutory or regulatory requirements applicable to a spill. Facilities possessing a Colorado Discharge Permit System (CDPS) permit should follow applicable permit terms and conditions regarding spill reporting and response. This guidance is not intended to supersede or modify such permit terms and conditions or the applicable statute and regulations. This guidance does not limit the existing rights or responsibilities of persons with respect to spill reporting. For example, persons retain the right and responsibility to determine in the first instance whether a particular spill is covered by an existing permit or may cause pollution to State waters (i.e., surface or ground waters).

II. Statutory Requirement Addressed

Colorado Water Quality Control Act - Spill Reporting Requirements - § 25-8-601(2), C.R.S.

> "Any person engaged in any operation or activity which results in a spill or discharge of oil or other substance which may cause pollution of the waters of the state contrary to the provisions of this article as soon as he has knowledge thereof, shall notify the division of such discharge."

State waters means any and all surface and subsurface waters which are contained in or flow in or through this state, but does not include waters in sewage systems, waters in treatment works of disposal systems, waters in potable water distribution systems, and all water withdrawn for use until use and treatment have been completed (§ 25-8-103 (19), C.R.S.).

Examples of State waters include, but are not limited to, perennial streams, intermittent or ephemeral gulches and arroyos, ponds, lakes, reservoirs, irrigation canals or ditches, wetlands, stormwater conveyances (when they discharge to a surface water), and groundwater.

III. Policy/Applicability

The Division distinguishes between reporting requirements for spills that occur with respect to activities that result in a discharge that is authorized under a CDPS permit and those that are not. For non-permitted activities, or in the case of an activity where a permit does not address reporting of or response to a given spill, the Division recommends that the responsible person(s) take the following actions:

1. Immediately report spills that may result in a non-permitted discharge of pollutants to State waters to the Environmental Release and Incident Reporting Line at 1-877-518-5608;
2. Include the following information, if available, when notifying the Division of a spill:
   a. The name of the responsible person and, if not reported by that person, the name of the person reporting the spill and the name of the responsible person if known;
   b. An estimate of the date and time that the spill began or the actual date and time, if known;

c. The location of the spill, its source (e.g., manhole, tanker truck), and identification of the type of material spilled (e.g., untreated wastewater, biosolids, specific chemical);

d. The estimated volume of the spill and, if known, the actual date and time the spill was fully controlled/stopped.

e. Whether the spill is ongoing and, if it is, the rate of flow and an estimate of the time that the spill will be fully controlled, if known;

f. Measures that are being or have been taken to contain, reduce, and/or clean up the spill;

g. A list of any potentially affected area and any known downstream water uses (e.g., public water supplies, irrigation diversions, public use areas such as parks or swim beaches) that will be or have been notified; and

h. A phone number and e-mail to contact a representative of the responsible person that is in charge of the response. Where a non-responsible person is reporting the spill, they are encouraged, but not required, to provide contact information.

Reporting and management of spills that occur with respect to activities resulting in a discharge authorized under a permit should be performed in accordance with the specific requirements of that permit. If the permit does not provide specific reporting or management response requirements for a given spill that may pollute State waters, the Division recommends that the responsible person report the spill in accordance with the procedures listed above.

This guidance only addresses reporting requirements under the Division's authority. The person or entity engaged in any operation or activity that results in a spill is responsible for any other applicable reporting requirements associated with the spill to other regulatory agencies.

Section 25-8-601(2), C.R.S. only addresses spill reporting to the Division. Section 25-8-202(7), C.R.S. provides certain water quality responsibilities to other state "implementing agencies." The Division's position is that, where a spill to the ground that may impact ground water only is fully and timely reported to an implementing agency having jurisdiction over that spill, the intent of section 601(2) has been fulfilled, and the spill need not also be reported to the Division. The Division suggests that the responsible person confirm with the implementing agency that a spill falls under the jurisdiction of the implementing agency at the time it is reported in order to avoid possible legal liability should it fall under the Division's jurisdiction.

IV. Division Examples of Non-Reportable Spills

The Division has identified the following examples of types of spills that are considered "non-reportable" under § 25-8-601(2), C.R.S. Documentation of such spills, including the information listed in section III.2.a – III.2.f above, should be maintained by the responsible person for Division review for a period of three years.

1. A spill to a generally impervious surface or structure (e.g., paved street/parking lot, storm sewer, warehouse floor, manhole, vault, concrete basement), or onto soils, that is fully contained in/on the impervious surface/structure or soils, or that is managed in a manner so that it will not reach State waters at the time of the spill or in the future. Such spills that are cleaned up within 24 hours will be considered by the Division to have no potential to reach State waters. However, even if such spills are not cleaned up within 24 hours, the responsible person may be able to "fully contain" or otherwise manage a spill such that it will not reach State waters. Where there is a sump pump present in a basement to which a spill occurred, the responsible person must establish that the pump did not discharge to State waters during the time between the start of the spill and the completion of clean-up in accordance with best management practices.
2. A spill or discharge that is managed consistent with best management practices that are established in accordance with a CDPS discharge permit or any Water Quality Control Commission-adopted control regulation related to spill management or reporting.
3. A spill of potable water from a public water system that does not reach surface waters.

Colorado Department of Public Health and Environment
Water Quality Control Division

Incident / Spill / SSO Release Reporting
Five (5) Day Reporting Form

☒ Field Services – Grand Junction 222 South 6th Street, Room 232 Grand Junction, CO 81501 Telephone: 970-248-7150 Fax: 970-248-7198 Contact email: michelle.thiebaud@state.co.us	☐ Field Services – Pueblo 140 Central Main, Suite 300 Pueblo, CO 81003 Telephone: 719-295-5060 Fax: 719-543-8441 Contact email: carol.keever@state.co.us	☐ Field Services – Denver 4300 Cherry Creek Dr. South, B2 Denver, Colorado 80246-1530 Phone: 303-692-3650 Fax: 303-782-0390 Contact email: annemarie.goolsby@state.co.us

Reporting Form: Incident / Spill / Sanitary Sewer Overflow (SSO)

The Water Quality Control Division distinguishes between reporting requirements for spills that occur with respect to activities that result in a discharge that is authorized under a CDPS permit and those that are not. Reporting and management of spills that occur with respect to activities resulting in a discharge authorized under a permit should be performed in accordance with the specific requirements of that permit. If the permit does not require a 5-day report, please provide the information below in writing. For non-permitted activities, or in the case of an activity where a permit does not address reporting of or response to a given spill, please submit this written response to the Water Quality Control Division within five (5) working days of the date of the event. If sufficient space is not provided, please attach other sheets. Please send the completed form with signature via fax or email to the Division's Field Services office indicated above. If you have any questions please contact the Division's Field Services Engineer at your earliest convenience. The Field Services County list is available at: http://www.colorado.gov/cdphe/wqcd (Contacts, Inspection services contacts, then Field services contacts).

Prior to the five (5) working day deadline, you may request an extension to submit the report if sample analyses justifiably are going to require more time to analyze than the reporting time allows. To request an extension please send an email to the Division's Field Services Engineer for the County that the incident / spill / SSO took place or to the email listed above.

Incident Background Information			
County			
Incident / Spill Number (Division provided) and Spill Date			
Type of Incident / Spill / SSO (check one)	☐ Sanitary Sewer Overflow/Reuse	☐ Petroleum Product	☐ Chemical
	☐ WW Treatment Plant Bypass or Upset (through an authorized outfall point)	☐ WW Treatment Plant Spill or Overflow (other than outfall)	☐ Biosolids
	☐ Unplanned potable water release (e.g., water line break)		☐ Other

Contact Information			
Potentially Responsible Party (PRP): Contact Name		Potentially Responsible Party (PRP): Company / Agency	
PRP Phone / Fax	Phone: Fax:	PRP email address	
CDPS Permit Number:		CDPS Permittee Name:	
Reported by (if not PRP): Contact Name		Reported by (if not PRP): Company / Agency	
Reported by (if not PRP): Phone / Fax	Phone: Fax:	Reported by (if not PRP): email address	

Incident Information: Please provide the following information.	
A	Incident / spill / SSO source, cause, and event description. Response:
B	Material released (e.g., untreated wastewater, biosolids, specific chemicals or products) and estimated total quantity (e.g., gallons). Please attach MSDS for any and all chemicals or products involved in spill or release. Response:
C	Actual or estimated dates and times of the event, including duration and actual date and time spill was fully controlled/stopped. If release is still occurring, the date and time the release is expected to be stopped. Response:

D	Location of release (e.g., address, lat/long, road name and mile marker).
	Response:
E	Describe measures taken or planned to contain, reduce, and clean up spill or release.
	Response:
F	Steps taken or planned to prevent reoccurrence of the event.
	Response:
Incident Impact to State Waters (As defined in § 25-8-103(19), C.R.S.). *Examples of State waters include: perennial streams, intermittent or ephemeral gulches, ditches, ponds, lakes, reservoirs, irrigation canals, wetlands, stormwater conveyances (when they discharge to surface water), and groundwater.*	
G	Did flow or materials reach surface waters of the State? If so, please describe the path of flow to State waters and which State water body was impacted (e.g., spill impacted a storm drain which was directly connected to Cherry Creek, Colorado River, etc.). If yes, what quantity of material (e.g., gallons) reached the surface water and what was the resulting impact?
	Response:
H	Were any water quality samples or other samples taken? If so, please describe sampling process and attached results.
	Response:
I	Did flow or materials reach groundwater of the State? If so, please describe the path of flow to State waters and which State water body impacted (e.g, spill soaked into ground and wet soil was not excavated). If yes, what quantity of material (e.g., gallons) reached the ground or groundwater and what was the resulting impact?
	Response:
J	Did the incident include any of the following (check if yes)? If so, please include additional details below.
	☐ Toxic Chemical Release ☐ Fish Kill
	Response:
Incident Impact to Areas or Water Users	
K	Did the incident / spill / SSO impact any areas (e.g., public use areas including parks or swim beaches) or downstream water users (e.g., public water suppliers, irrigation diversions)? Please list impacted areas and/or users, their location, and potential impacts.
	Response:
L	How were the impacted area users (e.g., park patrons) and downstream water users notified (e.g., signs posted, list downstream users contact via phone).
	Response:

I hereby certify that the information presented above is accurate and complete.

Date	Company	Typed Name and Title	Signature

BMP CONSTRUCTION DETAILS

Vehicle Tracking Control (VTC) SM-4

Description

Vehicle tracking controls provide stabilized construction site access where vehicles exit the site onto paved public roads. An effective vehicle tracking control helps remove sediment (mud or dirt) from vehicles, reducing tracking onto the paved surface.

Photograph VTC-1. A vehicle tracking control pad constructed with properly sized rock reduces off-site sediment tracking.

Appropriate Uses

Implement a stabilized construction entrance or vehicle tracking control where frequent heavy vehicle traffic exits the construction site onto a paved roadway. An effective vehicle tracking control is particularly important during the following conditions:

- Wet weather periods when mud is easily tracked off site.
- During dry weather periods where dust is a concern.
- When poorly drained, clayey soils are present on site.

Although wheel washes are not required in designs of vehicle tracking controls, they may be needed at particularly muddy sites.

Design and Installation

Construct the vehicle tracking control on a level surface. Where feasible, grade the tracking control towards the construction site to reduce off-site runoff. Place signage, as needed, to direct construction vehicles to the designated exit through the vehicle tracking control. There are several different types of stabilized construction entrances including:

VTC-1. Aggregate Vehicle Tracking Control. This is a coarse-aggregate surfaced pad underlain by a geotextile. This is the most common vehicle tracking control, and when properly maintained can be effective at removing sediment from vehicle tires.

VTC-2. Vehicle Tracking Control with Construction Mat or Turf Reinforcement Mat. This type of control may be appropriate for site access at very small construction sites with low traffic volume over vegetated areas. Although this application does not typically remove sediment from vehicles, it helps protect existing vegetation and provides a stabilized entrance.

Vehicle Tracking Control	
Functions	
Erosion Control	Moderate
Sediment Control	Yes
Site/Material Management	Yes

VTC-3. Stabilized Construction Entrance/Exit with Wheel Wash. This is an aggregate pad, similar to VTC-1, but includes equipment for tire washing. The wheel wash equipment may be as simple as hand-held power washing equipment to more advance proprietary systems. When a wheel wash is provided, it is important to direct wash water to a sediment trap prior to discharge from the site.

Vehicle tracking controls are sometimes installed in combination with a sediment trap to treat runoff.

Maintenance and Removal

Inspect the area for degradation and replace aggregate or material used for a stabilized entrance/exit as needed. If the area becomes clogged and ponds water, remove and dispose of excess sediment or replace material with a fresh layer of aggregate as necessary.

With aggregate vehicle tracking controls, ensure rock and debris from this area do not enter the public right-of-way.

Remove sediment that is tracked onto the public right of way daily or more frequently as needed. Excess sediment in the roadway indicates that the stabilized construction entrance needs maintenance.

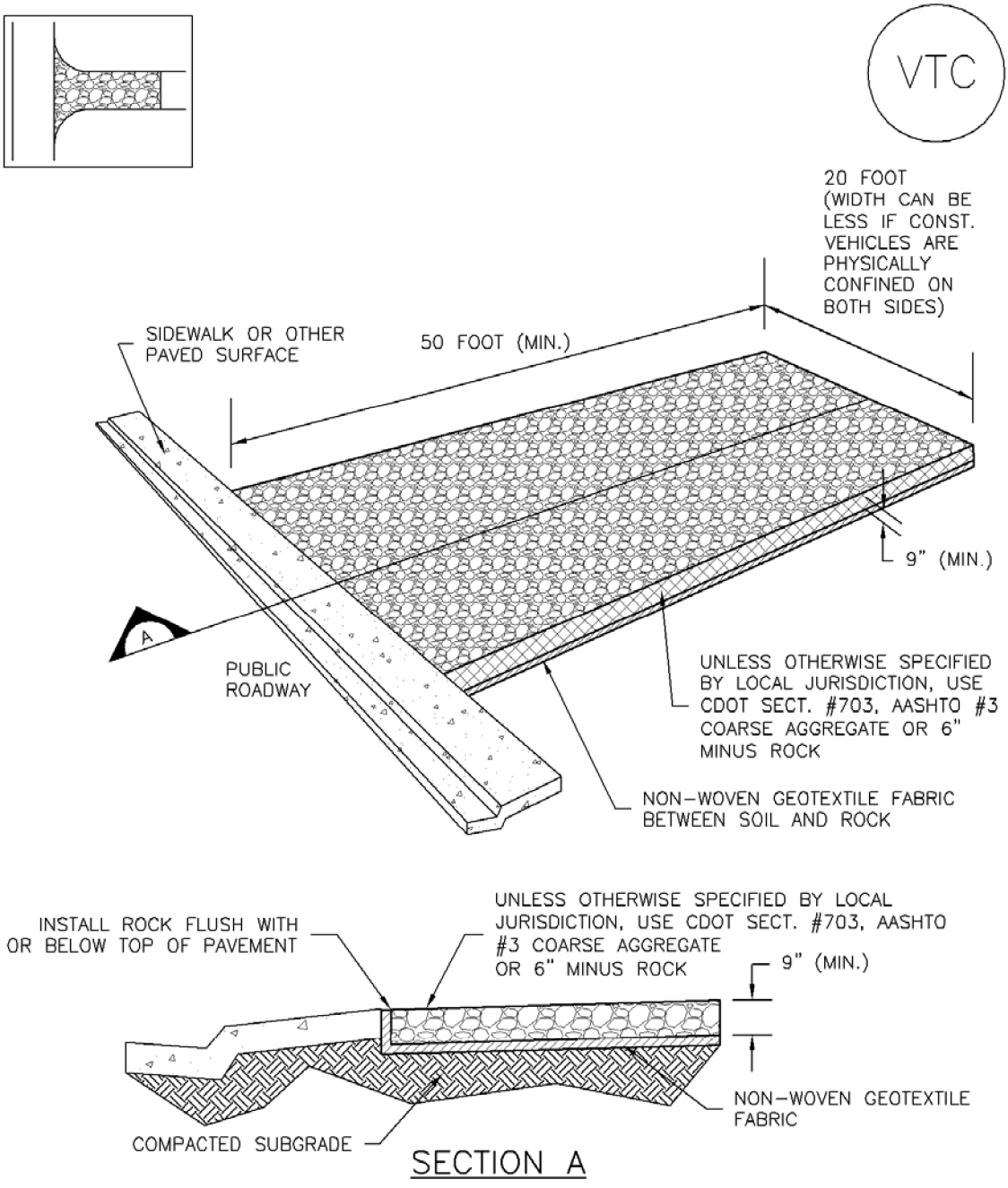
Ensure that drainage ditches at the entrance/exit area remain clear.

Photograph VTC-2. A vehicle tracking control pad with wheel wash facility. Photo courtesy of Tom Gore.

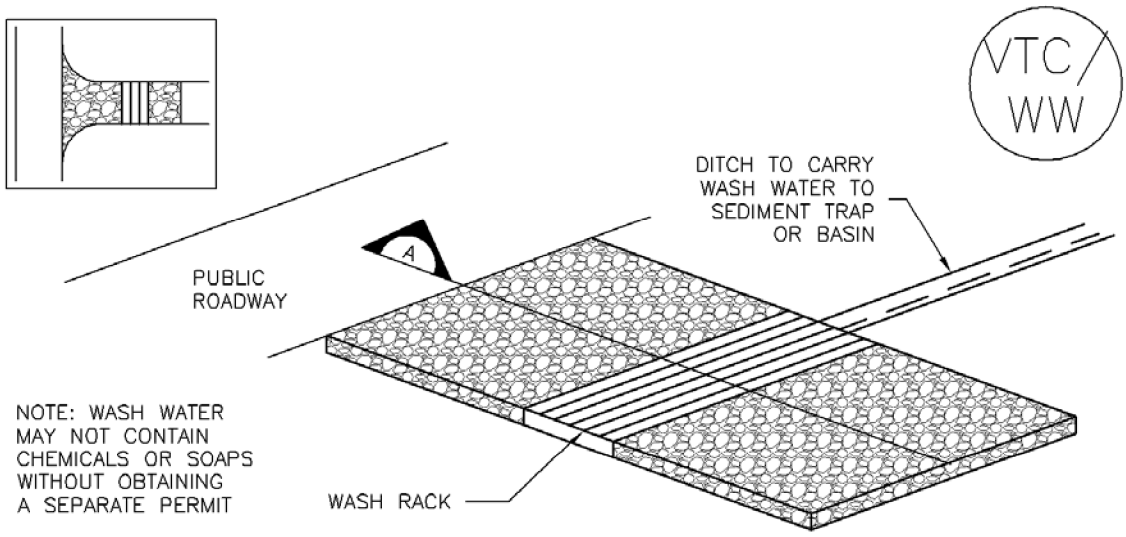
A stabilized entrance should be removed only when there is no longer the potential for vehicle tracking to occur. This is typically after the site has been stabilized.

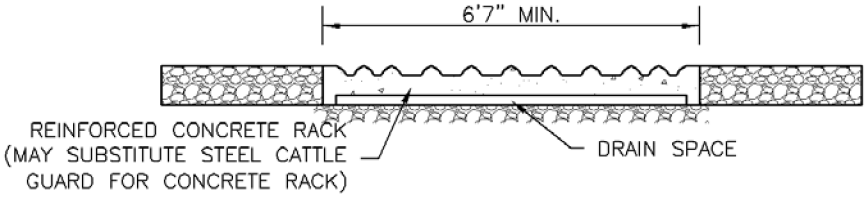
When wheel wash equipment is used, be sure that the wash water is discharged to a sediment trap prior to discharge. Also inspect channels conveying the water from the wash area to the sediment trap and stabilize areas that may be eroding.

When a construction entrance/exit is removed, excess sediment from the aggregate should be removed and disposed of appropriately. The entrance should be promptly stabilized with a permanent surface following removal, typically by paving.



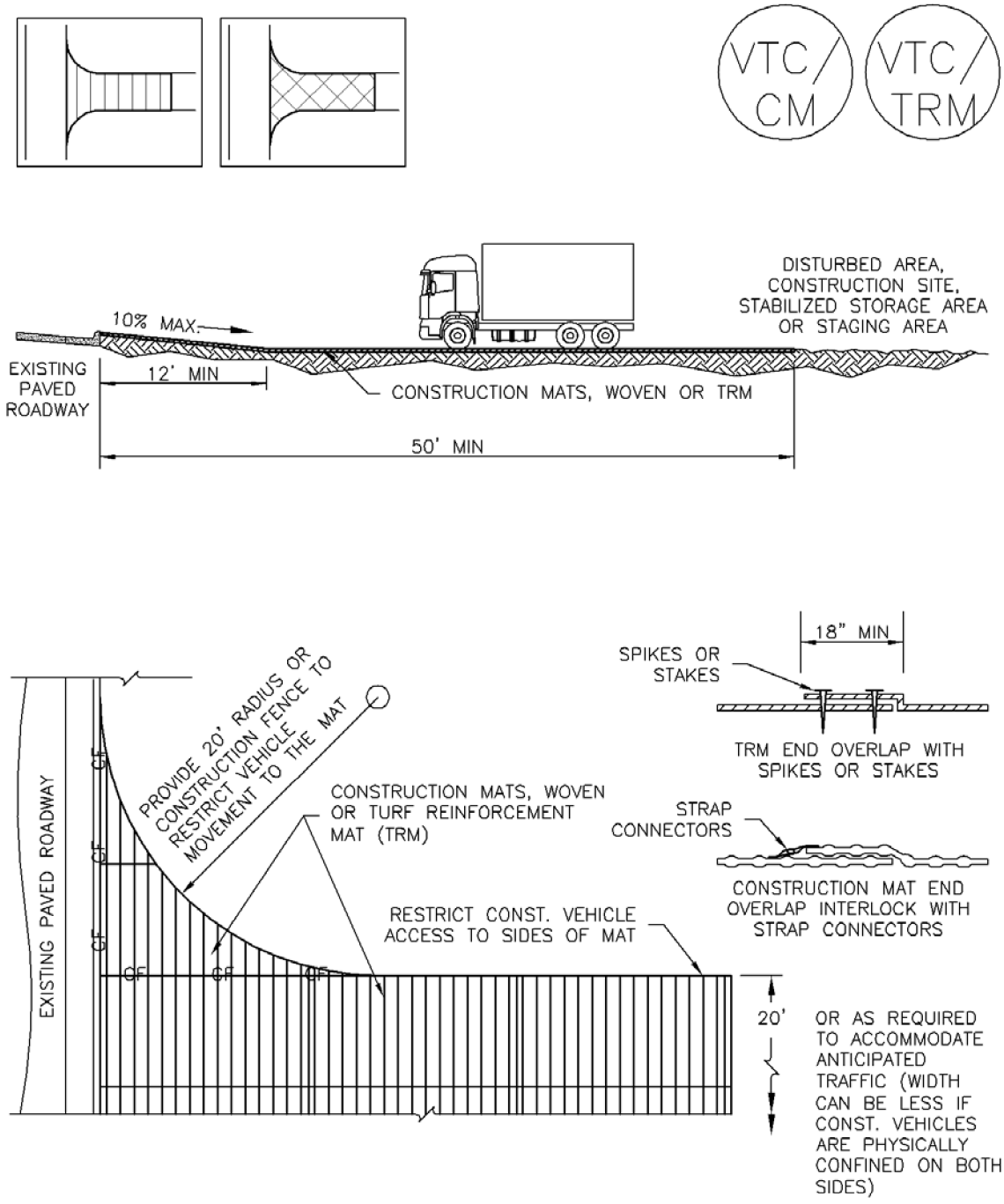
VTC-1. AGGREGATE VEHICLE TRACKING CONTROL





SECTION A

VTC–2. AGGREGATE VEHICLE TRACKING CONTROL WITH WASH RACK



VTC–3. VEHICLE TRACKING CONTROL W/ CONSTRUCTION MAT OR TURF REINFORCEMENT MAT (TRM)

STABILIZED CONSTRUCTION ENTRANCE/EXIT INSTALLATION NOTES

1. SEE PLAN VIEW FOR
   -LOCATION OF CONSTRUCTION ENTRANCE(S)/EXIT(S).
   -TYPE OF CONSTRUCTION ENTRANCE(S)/EXITS(S) (WITH/WITHOUT WHEEL WASH, CONSTRUCTION MAT OR TRM).

2. CONSTRUCTION MAT OR TRM STABILIZED CONSTRUCTION ENTRANCES ARE ONLY TO BE USED ON SHORT DURATION PROJECTS (TYPICALLY RANGING FROM A WEEK TO A MONTH) WHERE THERE WILL BE LIMITED VEHICULAR ACCESS.

3. A STABILIZED CONSTRUCTION ENTRANCE/EXIT SHALL BE LOCATED AT ALL ACCESS POINTS WHERE VEHICLES ACCESS THE CONSTRUCTION SITE FROM PAVED RIGHT-OF-WAYS.

4. STABILIZED CONSTRUCTION ENTRANCE/EXIT SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.

5. A NON-WOVEN GEOTEXTILE FABRIC SHALL BE PLACED UNDER THE STABILIZED CONSTRUCTION ENTRANCE/EXIT PRIOR TO THE PLACEMENT OF ROCK.

6. UNLESS OTHERWISE SPECIFIED BY LOCAL JURISDICTION, ROCK SHALL CONSIST OF DOT SECT. #703, AASHTO #3 COARSE AGGREGATE OR 6" (MINUS) ROCK.

STABILIZED CONSTRUCTION ENTRANCE/EXIT MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. ROCK SHALL BE REAPPLIED OR REGRADED AS NECESSARY TO THE STABILIZED ENTRANCE/EXIT TO MAINTAIN A CONSISTENT DEPTH.

5. SEDIMENT TRACKED ONTO PAVED ROADS IS TO BE REMOVED THROUGHOUT THE DAY AND AT THE END OF THE DAY BY SHOVELING OR SWEEPING. SEDIMENT MAY NOT BE WASHED DOWN STORM SEWER DRAINS.

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

(DETAILS ADAPTED FROM CITY OF BROOMFIELD, COLORADO, NOT AVAILABLE IN AUTOCAD)

Silt Fence (SF) SC-1

Description

A silt fence is a woven geotextile fabric attached to wooden posts and trenched into the ground. It is designed as a sediment barrier to intercept sheet flow runoff from disturbed areas.

Photograph SF-1. Silt fence creates a sediment barrier, forcing sheet flow runoff to evaporate or infiltrate.

Appropriate Uses

A silt fence can be used where runoff is conveyed from a disturbed area as sheet flow. Silt fence is not designed to receive concentrated flow or to be used as a filter fabric. Typical uses include:

- Down slope of a disturbed area to accept sheet flow.
- Along the perimeter of a receiving water such as a stream, pond or wetland.
- At the perimeter of a construction site.

Design and Installation

Silt fence should be installed along the contour of slopes so that it intercepts sheet flow. The maximum recommended tributary drainage area per 100 lineal feet of silt fence, installed along the contour, is approximately 0.25 acres with a disturbed slope length of up to 150 feet and a tributary slope gradient no steeper than 3:1. Longer and steeper slopes require additional measures. This recommendation only applies to silt fence installed along the contour. Silt fence installed for other uses, such as perimeter control, should be installed in a way that will not produce concentrated flows. For example, a "J-hook" installation may be appropriate to force runoff to pond and evaporate or infiltrate in multiple areas rather than concentrate and cause erosive conditions parallel to the silt fence.

See Detail SF-1 for proper silt fence installation, which involves proper trenching, staking, securing the fabric to the stakes, and backfilling the silt fence. Properly installed silt fence should not be easily pulled out by hand and there should be no gaps between the ground and the fabric.

Silt fence must meet the minimum allowable strength requirements, depth of installation requirement, and other specifications in the design details. Improper installation of silt fence is a common reason for silt fence failure; however, when properly installed and used for the appropriate purposes, it can be highly effective.

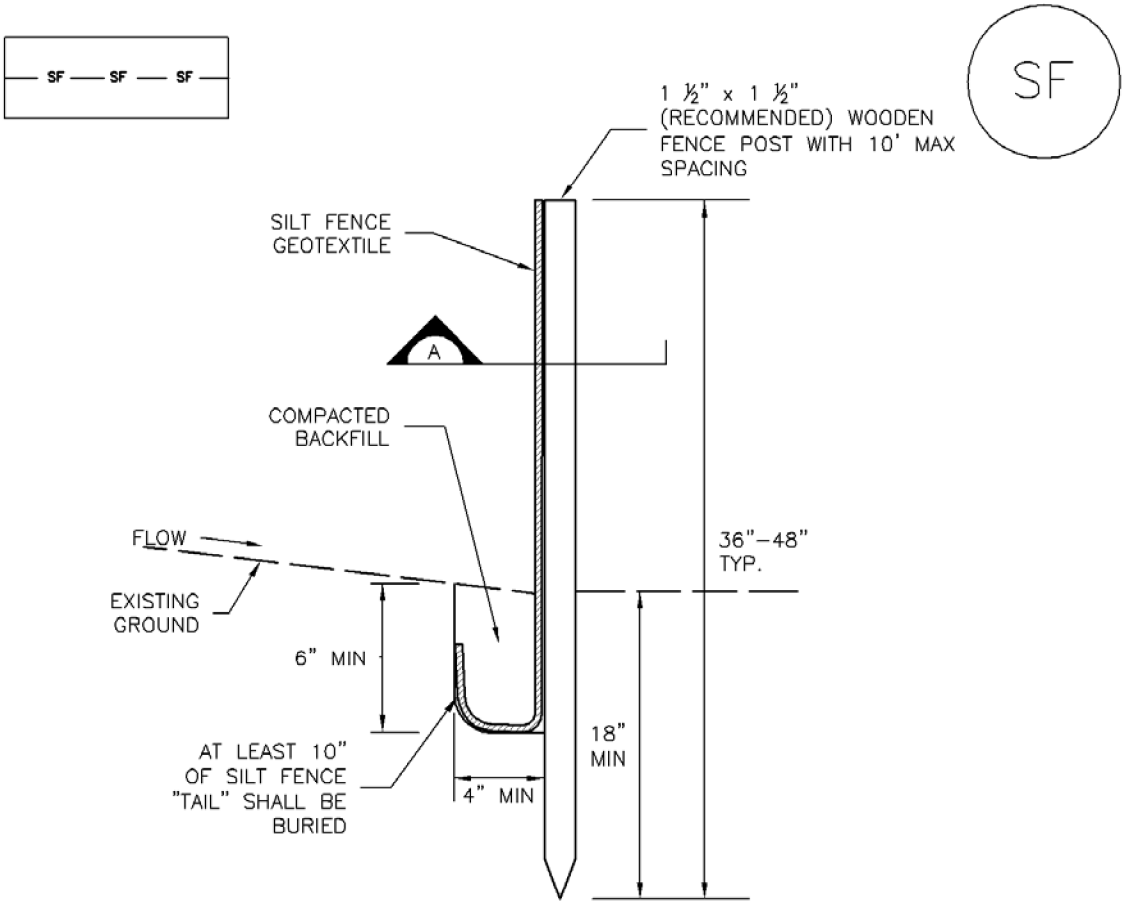
Silt Fence	
Functions	
Erosion Control	No
Sediment Control	Yes
Site/Material Management	No

Maintenance and Removal

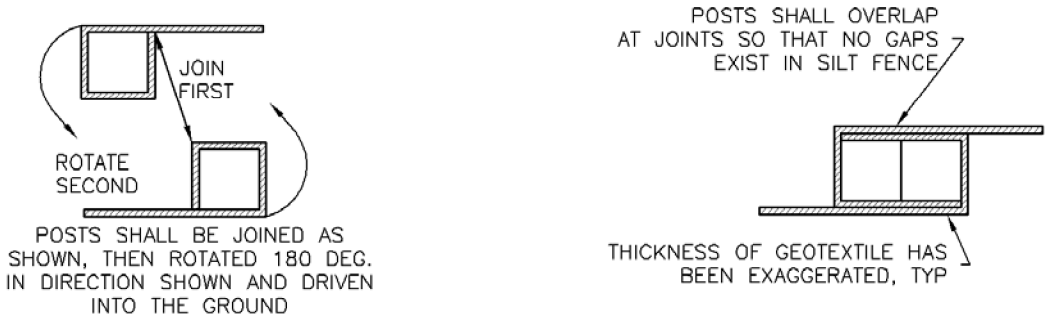
Inspection of silt fence includes observing the material for tears or holes and checking for slumping fence and undercut areas bypassing flows. Repair of silt fence typically involves replacing the damaged section with a new section. Sediment accumulated behind silt fence should be removed, as needed to maintain BMP effectiveness, typically before it reaches a depth of 6 inches.

Silt fence may be removed when the upstream area has reached final stabilization.

Photograph SF-2. When silt fence is not installed along the contour, a "J-hook" installation may be appropriate to ensure that the BMP does not create concentrated flow parallel to the silt fence. Photo courtesy of Tom Gore.



SILT FENCE



SECTION A

SF–1. SILT FENCE

SILT FENCE INSTALLATION NOTES

1. SILT FENCE MUST BE PLACED AWAY FROM THE TOE OF THE SLOPE TO ALLOW FOR WATER PONDING. SILT FENCE AT THE TOE OF A SLOPE SHOULD BE INSTALLED IN A FLAT LOCATION AT LEAST SEVERAL FEET (2–5 FT) FROM THE TOE OF THE SLOPE TO ALLOW ROOM FOR PONDING AND DEPOSITION.

2. A UNIFORM 6" X 4" ANCHOR TRENCH SHALL BE EXCAVATED USING TRENCHER OR SILT FENCE INSTALLATION DEVICE. NO ROAD GRADERS, BACKHOES, OR SIMILAR EQUIPMENT SHALL BE USED.

3. COMPACT ANCHOR TRENCH BY HAND WITH A "JUMPING JACK" OR BY WHEEL ROLLING. COMPACTION SHALL BE SUCH THAT SILT FENCE RESISTS BEING PULLED OUT OF ANCHOR TRENCH BY HAND.

4. SILT FENCE SHALL BE PULLED TIGHT AS IT IS ANCHORED TO THE STAKES. THERE SHOULD BE NO NOTICEABLE SAG BETWEEN STAKES AFTER IT HAS BEEN ANCHORED TO THE STAKES.

5. SILT FENCE FABRIC SHALL BE ANCHORED TO THE STAKES USING 1" HEAVY DUTY STAPLES OR NAILS WITH 1" HEADS. STAPLES AND NAILS SHOULD BE PLACED 3" ALONG THE FABRIC DOWN THE STAKE.

6. AT THE END OF A RUN OF SILT FENCE ALONG A CONTOUR, THE SILT FENCE SHOULD BE TURNED PERPENDICULAR TO THE CONTOUR TO CREATE A "J–HOOK." THE "J–HOOK" EXTENDING PERPENDICULAR TO THE CONTOUR SHOULD BE OF SUFFICIENT LENGTH TO KEEP RUNOFF FROM FLOWING AROUND THE END OF THE SILT FENCE (TYPICALLY 10' – 20').

7. SILT FENCE SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.

SILT FENCE MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. SEDIMENT ACCUMULATED UPSTREAM OF THE SILT FENCE SHALL BE REMOVED AS NEEDED TO MAINTAIN THE FUNCTIONALITY OF THE BMP, TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY 6".

5. REPAIR OR REPLACE SILT FENCE WHEN THERE ARE SIGNS OF WEAR, SUCH AS SAGGING, TEARING, OR COLLAPSE.

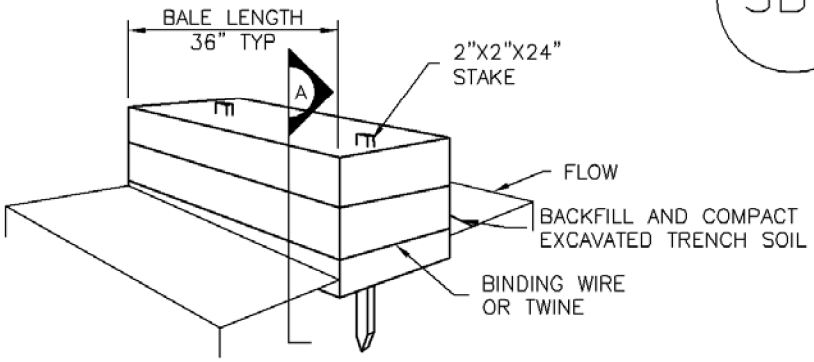
6. SILT FENCE IS TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION, OR IS REPLACED BY AN EQUIVALENT PERIMETER SEDIMENT CONTROL BMP.

7. WHEN SILT FENCE IS REMOVED, ALL DISTURBED AREAS SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION.

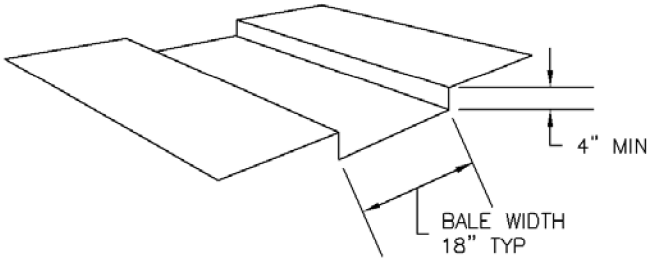
(DETAIL ADAPTED FROM TOWN OF PARKER, COLORADO AND CITY OF AURORA, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

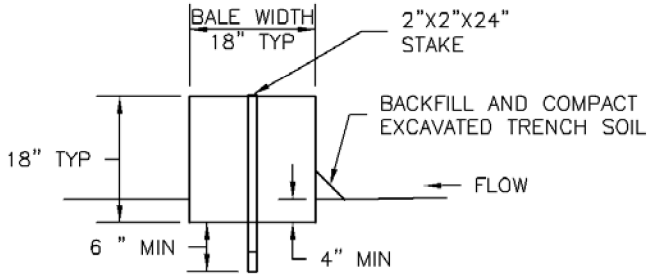
SBB



STRAW BALE



TRENCH FOR STRAW BALE



SECTION A

SBB–1. STRAW BALE

STRAW BALE INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   –LOCATION(S) OF STRAW BALES.

2. STRAW BALES SHALL CONSIST OF CERTIFIED WEED FREE STRAW OR HAY. LOCAL JURISDICTIONS MAY REQUIRE PROOF THAT BALES ARE WEED FREE.

3. STRAW BALES SHALL CONSIST OF APPROXIMATELY 5 CUBIC FEET OF STRAW OR HAY AND WEIGH NOT LESS THAN 35 POUNDS.

4. WHEN STRAW BALES ARE USED IN SERIES AS A BARRIER, THE END OF EACH BALE SHALL BE TIGHTLY ABUTTING ONE ANOTHER.

5. STRAW BALE DIMENSIONS SHALL BE APPROXIMATELY 36"X18"X18".

6. A UNIFORM ANCHOR TRENCH SHALL BE EXCAVATED TO A DEPTH OF 4". STRAW BALES SHALL BE PLACED SO THAT BINDING TWINE IS ENCOMPASSING THE VERTICAL SIDES OF THE BALE(S). ALL EXCAVATED SOIL SHALL BE PLACED ON THE UPHILL SIDE OF THE STRAW BALE(S) AND COMPACTED.

7. TWO (2) WOODEN STAKES SHALL BE USED TO HOLD EACH BALE IN PLACE. WOODEN STAKES SHALL BE 2"X2"X24". WOODEN STAKES SHALL BE DRIVEN 6" INTO THE GROUND.

STRAW BALE MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. STRAW BALES SHALL BE REPLACED IF THEY BECOME HEAVILY SOILED, ROTTEN, OR DAMAGED BEYOND REPAIR.

5. SEDIMENT ACCUMULATED UPSTREAM OF STRAW BALE BARRIER SHALL BE REMOVED AS NEEDED TO MAINTAIN FUNCTIONALITY OF THE BMP, TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY ¼ OF THE HEIGHT OF THE STRAW BALE BARRIER.

6. STRAW BALES ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION.

7. WHEN STRAW BALES ARE REMOVED, ALL DISTURBED AREAS SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION.

(DETAILS ADAPTED FROM TOWN OF PARKER, COLORADO, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

Inlet Protection (IP) SC-6

Description

Inlet protection consists of permeable barriers installed around an inlet to filter runoff and remove sediment prior to entering a storm drain inlet. Inlet protection can be constructed from rock socks, sediment control logs, silt fence, block and rock socks, or other materials approved by the local jurisdiction. Area inlets can also be protected by over-excavating around the inlet to form a sediment trap.

Photograph IP-1. Inlet protection for a curb opening inlet.

Appropriate Uses

Install protection at storm sewer inlets that are operable during construction. Consider the potential for tracked-out sediment or temporary stockpile areas to contribute sediment to inlets when determining which inlets must be protected. This may include inlets in the general proximity of the construction area, not limited to downgradient inlets. Inlet protection is not a stand-alone BMP and should be used in conjunction with other upgradient BMPs.

Design and Installation

To function effectively, inlet protection measures must be installed to ensure that flows do not bypass the inlet protection and enter the storm drain without treatment. However, designs must also enable the inlet to function without completely blocking flows into the inlet in a manner that causes localized flooding. When selecting the type of inlet protection, consider factors such as type of inlet (e.g., curb or area, sump or on-grade conditions), traffic, anticipated flows, ability to secure the BMP properly, safety and other site-specific conditions. For example, block and rock socks will be better suited to a curb and gutter along a roadway, as opposed to silt fence or sediment control logs, which cannot be properly secured in a curb and gutter setting, but are effective area inlet protection measures.

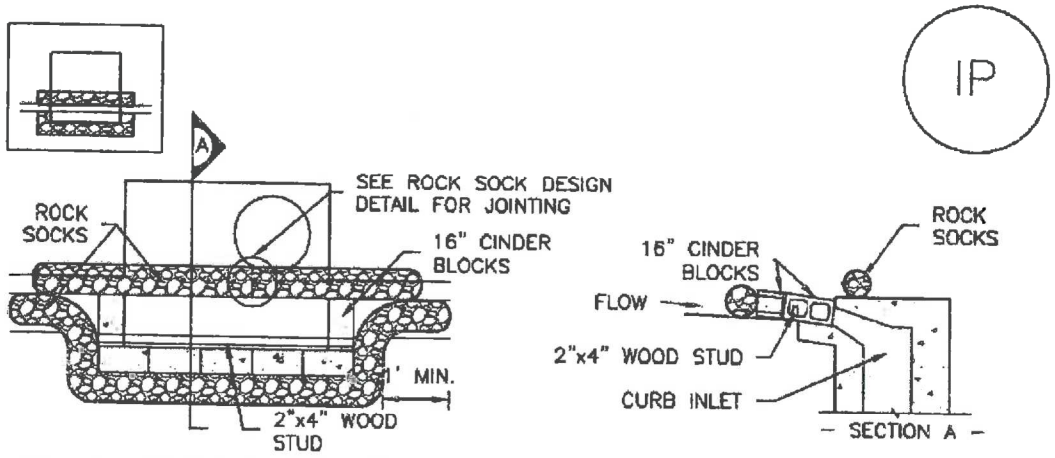
Several inlet protection designs are provided in the Design Details. Additionally, a variety of proprietary products are available for inlet protection that may be approved for use by local governments. If proprietary products are used, design details and installation procedures from the manufacturer must be followed. Regardless of the type of inlet protection selected, inlet protection is most effective when combined with other BMPs such as curb socks and check dams. Inlet protection is often the last barrier before runoff enters the storm sewer or receiving water.

Design details with notes are provided for these forms of inlet protection:

IP-1. Block and Rock Sock Inlet Protection for Sump or On-grade Inlets

IP-2. Curb (Rock) Socks Upstream of Inlet Protection, On-grade Inlets

Inlet Protection (various forms)	
Functions	
Erosion Control	No
Sediment Control	Yes
Site/Material Management	No



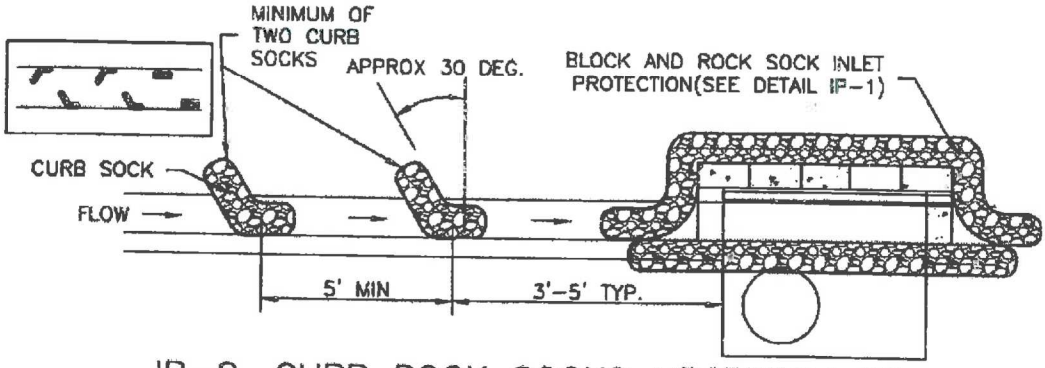
IP-1. BLOCK AND ROCK SOCK SUMP OR ON GRADE INLET PROTECTION

BLOCK AND CURB SOCK INLET PROTECTION INSTALLATION NOTES

1. SEE ROCK SOCK DESIGN DETAIL FOR INSTALLATION REQUIREMENTS.

2. CONCRETE "CINDER" BLOCKS SHALL BE LAID ON THEIR SIDES AROUND THE INLET IN A SINGLE ROW, ABUTTING ONE ANOTHER WITH THE OPEN END FACING AWAY FROM THE CURB.

3. GRAVEL BAGS SHALL BE PLACED AROUND CONCRETE BLOCKS, CLOSELY ABUTTING ONE ANOTHER AND JOINTED TOGETHER IN ACCORDANCE WITH ROCK SOCK DESIGN DETAIL.



IP-2. CURB ROCK SOCKS UPSTREAM OF INLET PROTECTION

CURB ROCK SOCK INLET PROTECTION INSTALLATION NOTES

1. SEE ROCK SOCK DESIGN DETAIL INSTALLATION REQUIREMENTS.

2. PLACEMENT OF THE SOCK SHALL BE APPROXIMATELY 30 DEGREES FROM PERPENDICULAR IN THE OPPOSITE DIRECTION OF FLOW.

3. SOCKS ARE TO BE FLUSH WITH THE CURB AND SPACED A MINIMUM OF 5 FEET APART.

4. AT LEAST TWO CURB SOCKS IN SERIES ARE REQUIRED UPSTREAM OF ON-GRADE INLETS.

GENERAL INLET PROTECTION INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   -LOCATION OF INLET PROTECTION.
   -TYPE OF INLET PROTECTION (IP.1, IP.2, IP.3, IP.4, IP.5, IP.6)

2. INLET PROTECTION SHALL BE INSTALLED PROMPTLY AFTER INLET CONSTRUCTION OR PAVING IS COMPLETE (TYPICALLY WITHIN 48 HOURS). IF A RAINFALL/RUNOFF EVENT IS FORECAST, INSTALL INLET PROTECTION PRIOR TO ONSET OF EVENT.

3. MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

INLET PROTECTION MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. SEDIMENT ACCUMULATED UPSTREAM OF INLET PROTECTION SHALL BE REMOVED AS NECESSARY TO MAINTAIN BMP EFFECTIVENESS, TYPICALLY WHEN STORAGE VOLUME REACHES 50% OF CAPACITY, A DEPTH OF 6" WHEN SILT FENCE IS USED, OR ¼ OF THE HEIGHT FOR STRAW BALES.

5. INLET PROTECTION IS TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS PERMANENTLY STABILIZED, UNLESS THE LOCAL JURISDICTION APPROVES EARLIER REMOVAL OF INLET PROTECTION IN STREETS.

6. WHEN INLET PROTECTION AT AREA INLETS IS REMOVED, THE DISTURBED AREA SHALL BE COVERED WITH TOP SOIL, SEEDED AND MULCHED, OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

(DETAIL ADAPTED FROM TOWN OF PARKER, COLORADO AND CITY OF AURORA, COLORADO, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

NOTE: THE DETAILS INCLUDED WITH THIS FACT SHEET SHOW COMMONLY USED, CONVENTIONAL METHODS OF INLET PROTECTION IN THE DENVER METROPOLITAN AREA. THERE ARE MANY PROPRIETARY INLET PROTECTION METHODS ON THE MARKET. UDFCD NEITHER ENDORSES NOR DISCOURAGES USE OF PROPRIETARY INLET PROTECTION; HOWEVER, IN THE EVENT PROPRIETARY METHODS ARE USED, THE APPROPRIATE DETAIL FROM THE MANUFACTURER MUST BE INCLUDED IN THE SWMP AND THE BMP MUST BE INSTALLED AND MAINTAINED AS SHOWN IN THE MANUFACTURER'S DETAILS.

NOTE: SOME MUNICIPALITIES DISCOURAGE OR PROHIBIT THE USE OF STRAW BALES FOR INLET PROTECTION. CHECK WITH LOCAL JURISDICTION TO DETERMINE IF STRAW BALE INLET PROTECTION IS ACCEPTABLE.

IP-3. Rock Sock Inlet Protection for Sump/Area Inlet

IP-4. Silt Fence Inlet Protection for Sump/Area Inlet

IP-5. Over-excavation Inlet Protection

IP-6. Straw Bale Inlet Protection for Sump/Area Inlet

CIP-1. Culvert Inlet Protection

Propriety inlet protection devices should be installed in accordance with manufacturer specifications.

More information is provided below on selecting inlet protection for sump and on-grade locations.

Inlets Located in a Sump

When applying inlet protection in sump conditions, it is important that the inlet continue to function during larger runoff events. For curb inlets, the maximum height of the protective barrier should be lower than the top of the curb opening to allow overflow into the inlet during larger storms without excessive localized flooding. If the inlet protection height is greater than the curb elevation, particularly if the filter becomes clogged with sediment, runoff will not enter the inlet and may bypass it, possibly causing localized flooding, public safety issues, and downstream erosion and damage from bypassed flows.

Area inlets located in a sump setting can be protected through the use of silt fence, concrete block and rock socks (on paved surfaces), sediment control logs/straw wattles embedded in the adjacent soil and stacked around the area inlet (on pervious surfaces), over-excavation around the inlet, and proprietary products providing equivalent functions.

Inlets Located on a Slope

For curb and gutter inlets on paved sloping streets, block and rock sock inlet protection is recommended in conjunction with curb socks in the gutter leading to the inlet. For inlets located along unpaved roads, also see the Check Dam Fact Sheet.

Maintenance and Removal

Inspect inlet protection frequently. Inspection and maintenance guidance includes:

- Inspect for tears that can result in sediment directly entering the inlet, as well as result in the contents of the BMP (e.g., gravel) washing into the inlet.
- Check for improper installation resulting in untreated flows bypassing the BMP and directly entering the inlet or bypassing to an unprotected downstream inlet. For example, silt fence that has not been properly trenched around the inlet can result in flows under the silt fence and directly into the inlet.
- Look for displaced BMPs that are no longer protecting the inlet. Displacement may occur following larger storm events that wash away or reposition the inlet protection. Traffic or equipment may also crush or displace the BMP.
- Monitor sediment accumulation upgradient of the inlet protection.

- Remove sediment accumulation from the area upstream of the inlet protection, as needed to maintain BMP effectiveness, typically when it reaches no more than half the storage capacity of the inlet protection. For silt fence, remove sediment when it accumulates to a depth of no more than 6 inches. Remove sediment accumulation from the area upstream of the inlet protection as needed to maintain the functionality of the BMP.

- Propriety inlet protection devices should be inspected and maintained in accordance with manufacturer specifications. If proprietary inlet insert devices are used, sediment should be removed in a timely manner to prevent devices from breaking and spilling sediment into the storm drain.

Inlet protection must be removed and properly disposed of when the drainage area for the inlet has reached final stabilization.

Concrete Washout Area (CWA) MM-1

Description

Concrete waste management involves designating and properly managing a specific area of the construction site as a concrete washout area. A concrete washout area can be created using one of several approaches designed to receive wash water from washing of tools and concrete mixer chutes, liquid concrete waste from dump trucks, mobile batch mixers, or pump trucks. Three basic approaches are available: excavation of a pit in the ground, use of an above ground storage area, or use of prefabricated haul-away concrete washout containers. Surface discharges of concrete washout water from construction sites are prohibited.

Photograph CWA-1. Example of concrete washout area. Note gravel tracking pad for access and sign.

Appropriate Uses

Concrete washout areas must be designated on all sites that will generate concrete wash water or liquid concrete waste from onsite concrete mixing or concrete delivery.

Because pH is a pollutant of concern for washout activities, when unlined pits are used for concrete washout, the soil must have adequate buffering capacity to result in protection of state groundwater standards; otherwise, a liner/containment must be used. The following management practices are recommended to prevent an impact from unlined pits to groundwater:

- The use of the washout site should be temporary (less than 1 year), and
- The washout site should be not be located in an area where shallow groundwater may be present, such as near natural drainages, springs, or wetlands.

Design and Installation

Concrete washout activities must be conducted in a manner that does not contribute pollutants to surface waters or stormwater runoff. Concrete washout areas may be lined or unlined excavated pits in the ground, commercially manufactured prefabricated washout containers, or aboveground holding areas constructed of berms, sandbags or straw bales with a plastic liner.

Although unlined washout areas may be used, lined pits may be required to protect groundwater under certain conditions.

Do not locate an unlined washout area within 400 feet of any natural drainage pathway or waterbody or within 1,000 feet of any wells or drinking water sources. Even for lined concrete washouts, it is advisable to locate the facility away from waterbodies and drainage paths. If site constraints make these

Concrete Washout Area	
Functions	
Erosion Control	No
Sediment Control	No
Site/Material Management	Yes

setbacks infeasible or if highly permeable soils exist in the area, then the pit must be installed with an impermeable liner (16 mil minimum thickness) or surface storage alternatives using prefabricated concrete washout devices or a lined aboveground storage area should be used.

Design details with notes are provided in Detail CWA-1 for pits and CWA-2 for aboveground storage areas. Pre-fabricated concrete washout container information can be obtained from vendors.

Maintenance and Removal

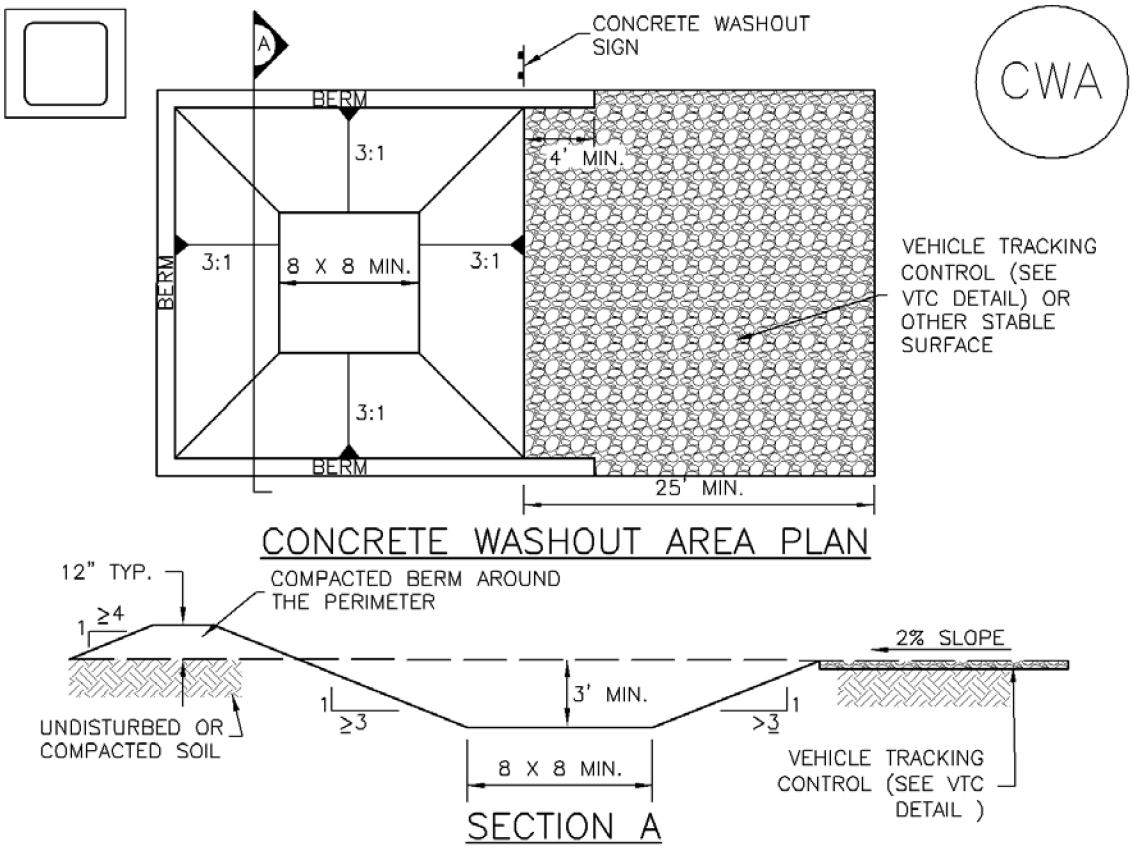
A key consideration for concrete washout areas is to ensure that adequate signage is in place identifying the location of the washout area. Part of inspecting and maintaining washout areas is ensuring that adequate signage is provided and in good repair and that the washout area is being used, as opposed to washout in non-designated areas of the site.

Remove concrete waste in the washout area, as needed to maintain BMP function (typically when filled to about two-thirds of its capacity). Collect concrete waste and deliver offsite to a designated disposal location.

Upon termination of use of the washout site, accumulated solid waste, including concrete waste and any contaminated soils, must be removed from the site to prevent on-site disposal of solid waste. If the wash water is allowed to evaporate and the concrete hardens, it may be recycled.

Photograph CWA-2. Prefabricated concrete washout. Photo courtesy of CDOT.

Photograph CWA-3. Earthen concrete washout. Photo courtesy of CDOT.



CWA–1. CONCRETE WASHOUT AREA

CWA INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   –CWA INSTALLATION LOCATION.

2. DO NOT LOCATE AN UNLINED CWA WITHIN 400' OF ANY NATURAL DRAINAGE PATHWAY OR WATERBODY. DO NOT LOCATE WITHIN 1,000' OF ANY WELLS OR DRINKING WATER SOURCES. IF SITE CONSTRAINTS MAKE THIS INFEASIBLE, OR IF HIGHLY PERMEABLE SOILS EXIST ON SITE, THE CWA MUST BE INSTALLED WITH AN IMPERMEABLE LINER (16 MIL MIN. THICKNESS) OR SURFACE STORAGE ALTERNATIVES USING PREFABRICATED CONCRETE WASHOUT DEVICES OR A LINED ABOVE GROUND STORAGE ARE SHOULD BE USED.

3. THE CWA SHALL BE INSTALLED PRIOR TO CONCRETE PLACEMENT ON SITE.

4. CWA SHALL INCLUDE A FLAT SUBSURFACE PIT THAT IS AT LEAST 8' BY 8' SLOPES LEADING OUT OF THE SUBSURFACE PIT SHALL BE 3:1 OR FLATTER. THE PIT SHALL BE AT LEAST 3' DEEP.

5. BERM SURROUNDING SIDES AND BACK OF THE CWA SHALL HAVE MINIMUM HEIGHT OF 1'.

6. VEHICLE TRACKING PAD SHALL BE SLOPED 2% TOWARDS THE CWA.

7. SIGNS SHALL BE PLACED AT THE CONSTRUCTION ENTRANCE, AT THE CWA, AND ELSEWHERE AS NECESSARY TO CLEARLY INDICATE THE LOCATION OF THE CWA TO OPERATORS OF CONCRETE TRUCKS AND PUMP RIGS.

8. USE EXCAVATED MATERIAL FOR PERIMETER BERM CONSTRUCTION.

CWA MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. THE CWA SHALL BE REPAIRED, CLEANED, OR ENLARGED AS NECESSARY TO MAINTAIN CAPACITY FOR CONCRETE WASTE. CONCRETE MATERIALS, ACCUMULATED IN PIT, SHALL BE REMOVED ONCE THE MATERIALS HAVE REACHED A DEPTH OF 2'.

5. CONCRETE WASHOUT WATER, WASTED PIECES OF CONCRETE AND ALL OTHER DEBRIS IN THE SUBSURFACE PIT SHALL BE TRANSPORTED FROM THE JOB SITE IN A WATER–TIGHT CONTAINER AND DISPOSED OF PROPERLY.

6. THE CWA SHALL REMAIN IN PLACE UNTIL ALL CONCRETE FOR THE PROJECT IS PLACED.

7. WHEN THE CWA IS REMOVED, COVER THE DISTURBED AREA WITH TOP SOIL, SEED AND MULCH OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

(DETAIL ADAPTED FROM DOUGLAS COUNTY, COLORADO AND THE CITY OF PARKER, COLORADO, NOT AVAILABLE IN AUTOCAD).

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

Description

A sediment basin is a temporary pond built on a construction site to capture eroded or disturbed soil transported in storm runoff prior to discharge from the site. Sediment basins are designed to capture site runoff and slowly release it to allow time for settling of sediment prior to discharge. Sediment basins are often constructed in locations that will later be modified to serve as post-construction stormwater basins.

Photograph SB-1. Sediment basin at the toe of a slope. Photo courtesy of WWE.

Appropriate Uses

Most large construction sites (typically greater than 2 acres) will require one or more sediment basins for effective management of construction site runoff. On linear construction projects, sediment basins may be impractical; instead, sediment traps or other combinations of BMPs may be more appropriate.

Sediment basins should not be used as stand-alone sediment controls. Erosion and other sediment controls should also be implemented upstream.

When feasible, the sediment basin should be installed in the same location where a permanent post-construction detention pond will be located.

Design and Installation

The design procedure for a sediment basin includes these steps:

- **Basin Storage Volume**: Provide a storage volume of at least 3,600 cubic feet per acre of drainage area. To the extent practical, undisturbed and/or off-site areas should be diverted around sediment basins to prevent "clean" runoff from mixing with runoff from disturbed areas. For undisturbed areas (both on-site and off-site) that cannot be diverted around the sediment basin, provide a minimum of 500 ft^3/acre of storage for undeveloped (but stable) off-site areas in addition to the 3,600 ft^3/acre for disturbed areas. For stable, developed areas that cannot be diverted around the sediment basin, storage volume requirements are summarized in Table SB-1.

- **Basin Geometry:** Design basin with a minimum length-to-width ratio of 2:1 (L:W). If this cannot be achieved because of site space constraints, baffling may be required to extend the effective distance between the inflow point(s) and the outlet to minimize short-circuiting.

- **Dam Embankment**: It is recommended that embankment slopes be 4:1 (H:V) or flatter and no steeper than 3:1 (H:V) in any location.

Sediment Basins	
Functions	
Erosion Control	No
Sediment Control	Yes
Site/Material Management	No

- **Inflow Structure**: For concentrated flow entering the basin, provide energy dissipation at the point of inflow.

Table SB-1. Additional Volume Requirements for Undisturbed and Developed Tributary Areas Draining through Sediment Basins

Imperviousness (%)	Additional Storage Volume (ft^3) Per Acre of Tributary Area
Undeveloped	500
10	800
20	1230
30	1600
40	2030
50	2470
60	2980
70	3560
80	4360
90	5300
100	6460

- **Outlet Works**: The outlet pipe shall extend through the embankment at a minimum slope of 0.5 percent. Outlet works can be designed using one of the following approaches:

  - **Riser Pipe (Simplified Detail):** Detail SB-1 provides a simplified design for basins treating no more than 15 acres.

  - **Orifice Plate or Riser Pipe**: Follow the design criteria for Full Spectrum Detention outlets in the EDB Fact Sheet provided in Chapter 4 of this manual for sizing of outlet perforations with an emptying time of approximately 72 hours. In lieu of the trash rack, pack uniformly sized 1½ - to 2-inch gravel in front of the plate or surrounding the riser pipe. This gravel will need to be cleaned out frequently during the construction period as sediment accumulates within it. The gravel pack will need to be removed and disposed of following construction to reclaim the basin for use as a permanent detention facility. If the basin will be used as a permanent extended detention basin for the site, a trash rack will need to be installed once contributing drainage areas have been stabilized and the gravel pack and accumulated sediment have been removed.

  - **Floating Skimmer**: If a floating skimmer is used, install it using manufacturer's recommendations. Illustration SB-1 provides an illustration of a Faircloth Skimmer Floating Outlet™, one of the more commonly used floating skimmer outlets. A skimmer should be designed to release the design volume in no less than 48 hours. The use of a floating skimmer outlet can increase the sediment capture efficiency of a basin significantly. A floating outlet continually decants cleanest water off the surface of the pond and releases cleaner water than would discharge from a perforated riser pipe or plate.

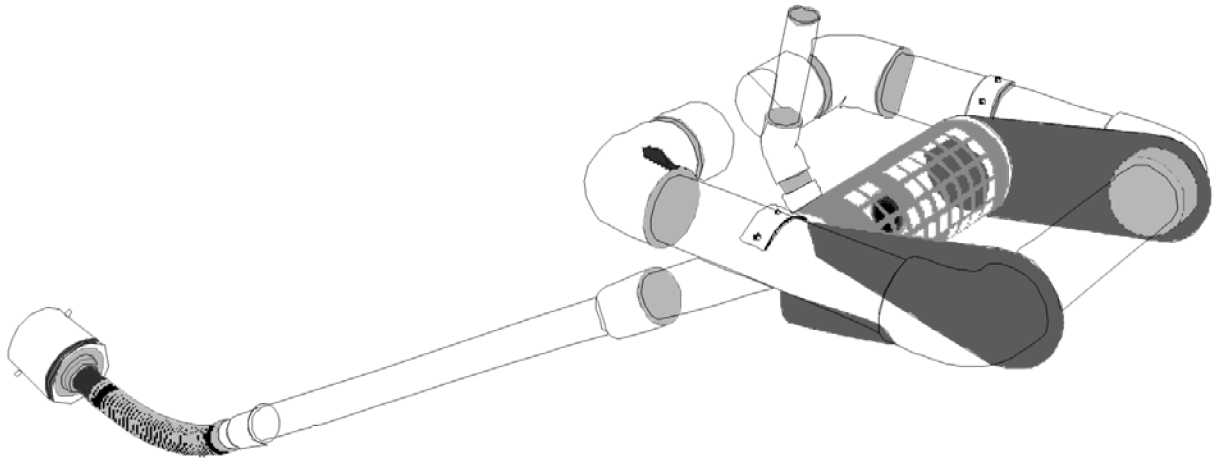


Illustration SB-1. Outlet structure for a temporary sediment basin - Faircloth Skimmer Floating Outlet. Illustration courtesy of J. W. Faircloth & Sons, Inc., FairclothSkimmer.com.

- **Outlet Protection and Spillway:** Consider all flow paths for runoff leaving the basin, including protection at the typical point of discharge as well as overtopping.
  - **Outlet Protection:** Outlet protection should be provided where the velocity of flow will exceed the maximum permissible velocity of the material of the waterway into which discharge occurs. This may require the use of a riprap apron at the outlet location and/or other measures to keep the waterway from eroding.
  - **Emergency Spillway:** Provide a stabilized emergency overflow spillway for rainstorms that exceed the capacity of the sediment basin volume and its outlet. Protect basin embankments from erosion and overtopping. If the sediment basin will be converted to a permanent detention basin, design and construct the emergency spillway(s) as required for the permanent facility. If the sediment basin will not become a permanent detention basin, it may be possible to substitute a heavy polyvinyl membrane or properly bedded rock cover to line the spillway and downstream embankment, depending on the height, slope, and width of the embankments.

Maintenance and Removal

Maintenance activities include the following:

- Dredge sediment from the basin, as needed to maintain BMP effectiveness, typically when the design storage volume is no more than one-third filled with sediment.
- Inspect the sediment basin embankments for stability and seepage.
- Inspect the inlet and outlet of the basin, repair damage, and remove debris. Remove, clean and replace the gravel around the outlet on a regular basis to remove the accumulated sediment within it and keep the outlet functioning.
- Be aware that removal of a sediment basin may require dewatering and associated permit requirements.
- Do not remove a sediment basin until the upstream area has been stabilized with vegetation.

Final disposition of the sediment basin depends on whether the basin will be converted to a permanent post-construction stormwater basin or whether the basin area will be returned to grade. For basins being converted to permanent detention basins, remove accumulated sediment and reconfigure the basin and outlet to meet the requirements of the final design for the detention facility. If the sediment basin is not to be used as a permanent detention facility, fill the excavated area with soil and stabilize with vegetation.

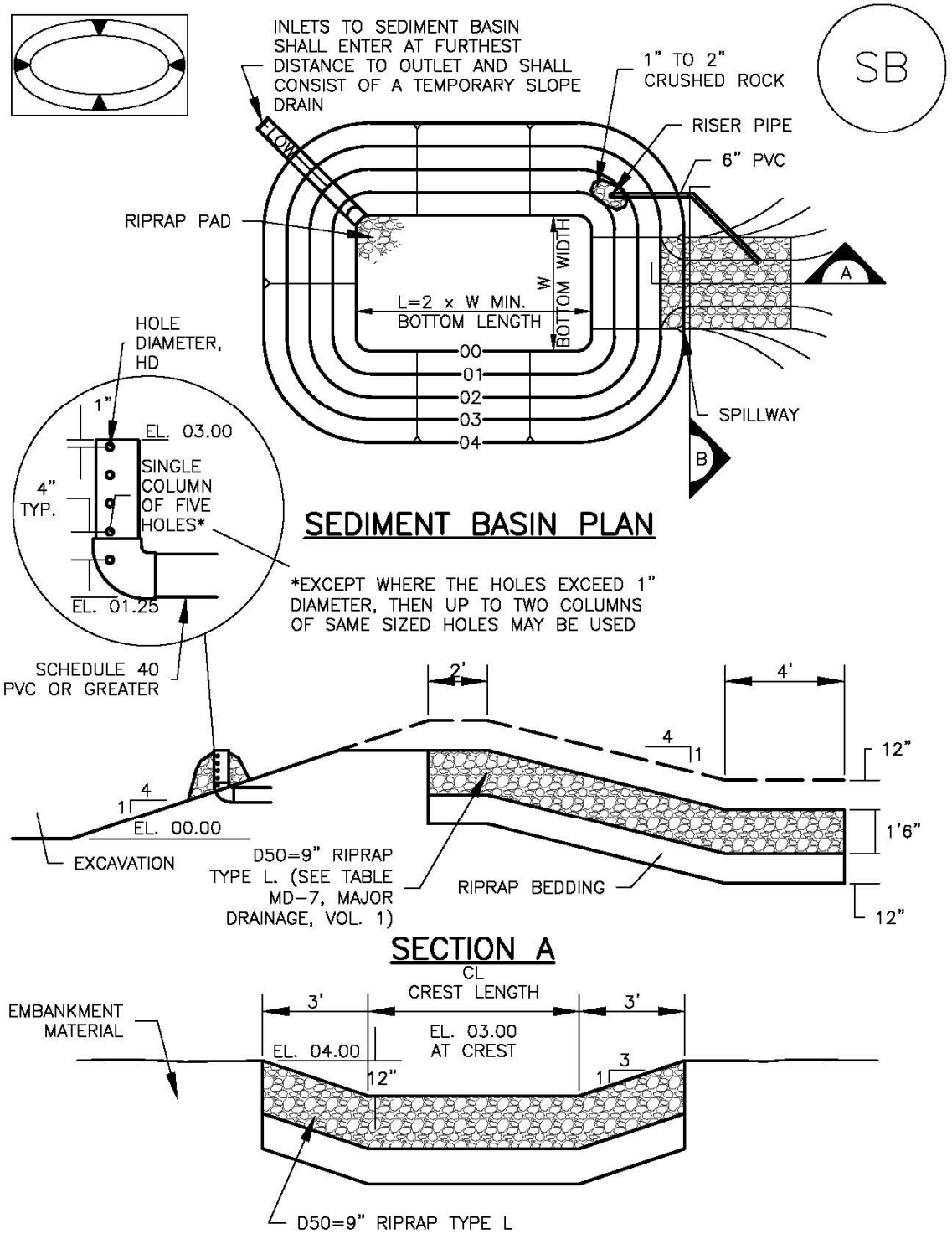

SB
INLETS TO SEDIMENT BASIN SHALL ENTER AT FURTHEST DISTANCE TO OUTLET AND SHALL CONSIST OF A TEMPORARY SLOPE DRAIN
FLOW
1" TO 2" CRUSHED ROCK
RISER PIPE
6" PVC
RIPRAP PAD
W BOTTOM WIDTH
L=2 x W MIN. BOTTOM LENGTH
00
01
02
03
04
A
B
SPILLWAY
HOLE DIAMETER, HD
1"
EL. 03.00
4" TYP.
SINGLE COLUMN OF FIVE HOLES*
EL. 01.25
SCHEDULE 40 PVC OR GREATER
SEDIMENT BASIN PLAN
*EXCEPT WHERE THE HOLES EXCEED 1" DIAMETER, THEN UP TO TWO COLUMNS OF SAME SIZED HOLES MAY BE USED
2'
4'
4
1
12"
4
1
EL. 00.00
EXCAVATION
D50=9" RIPRAP TYPE L. (SEE TABLE MD-7, MAJOR DRAINAGE, VOL. 1)
RIPRAP BEDDING
1'6"
12"
SECTION A
CL
CREST LENGTH
3'
3'
EMBANKMENT MATERIAL
EL. 04.00
EL. 03.00 AT CREST
12"
3
1
D50=9" RIPRAP TYPE L

TABLE SB–1. SIZING INFORMATION FOR STANDARD SEDIMENT BASIN			
Upstream Drainage Area (rounded to nearest acre), (ac)	Basin Bottom Width (W), (ft)	Spillway Crest Length (CL), (ft)	Hole Diameter (HD), (in)
1	12 ½	2	9/32
2	21	3	13/16
3	28	5	½
4	33 ½	6	9/16
5	38 ½	8	21/32
6	43	9	21/32
7	47 ¼	11	25/32
8	51	12	27/32
9	55	13	⅞
10	58 ¼	15	15/16
11	61	16	31/32
12	64	18	1
13	67 ½	19	1 1/16
14	70 ½	21	1 ⅛
15	73 ¼	22	1 3/16

SEDIMENT BASIN INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   - –LOCATION OF SEDIMENT BASIN.
   - –TYPE OF BASIN (STANDARD BASIN OR NONSTANDARD BASIN).
   - –FOR STANDARD BASIN, BOTTOM WIDTH W, CREST LENGTH CL, AND HOLE DIAMETER, HD.
   - –FOR NONSTANDARD BASIN, SEE CONSTRUCTION DRAWINGS FOR DESIGN OF BASIN INCLUDING RISER HEIGHT H, NUMBER OF COLUMNS N, HOLE DIAMETER HD AND PIPE DIAMETER D.

2. FOR STANDARD BASIN, BOTTOM DIMENSION MAY BE MODIFIED AS LONG AS BOTTOM AREA IS NOT REDUCED.

3. SEDIMENT BASINS SHALL BE INSTALLED PRIOR TO ANY OTHER LAND–DISTURBING ACTIVITY THAT RELIES ON ON BASINS AS AS A STORMWATER CONTROL.

4. EMBANKMENT MATERIAL SHALL CONSIST OF SOIL FREE OF DEBRIS, ORGANIC MATERIAL, AND ROCKS OR CONCRETE GREATER THAN 3 INCHES AND SHALL HAVE A MINIMUM OF 15 PERCENT BY WEIGHT PASSING THE NO. 200 SIEVE.

5. EMBANKMENT MATERIAL SHALL BE COMPACTED TO AT LEAST 95 PERCENT OF MAXIMUM DENSITY IN ACCORDANCE WITH ASTM D698.

6. PIPE SCH 40 OR GREATER SHALL BE USED.

7. THE DETAILS SHOWN ON THESE SHEETS PERTAIN TO STANDARD SEDIMENT BASIN(S) FOR DRAINAGE AREAS LESS THAN 15 ACRES. SEE CONSTRUCTION DRAWINGS FOR EMBANKMENT, STORAGE VOLUME, SPILLWAY, OUTLET, AND OUTLET PROTECTION DETAILS FOR ANY SEDIMENT BASIN(S) THAT HAVE BEEN INDIVIDUALLY DESIGNED FOR DRAINAGE AREAS LARGER THAN 15 ACRES.

SEDIMENT BASIN MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. SEDIMENT ACCUMULATED IN BASIN SHALL BE REMOVED AS NEEDED TO MAINTAIN BMP EFFECTIVENESS, TYPICALLY WHEN SEDIMENT DEPTH REACHES ONE FOOT (I.E., TWO FEET BELOW THE SPILLWAY CREST).

5. SEDIMENT BASINS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVER IS ACCEPTED BY THE LOCAL JURISDICTION.

6. WHEN SEDIMENT BASINS ARE REMOVED, ALL DISTURBED AREAS SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION.

(DETAILS ADAPTED FROM DOUGLAS COUNTY, COLORADO)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

Temporary and Permanent Seeding (TS/PS) EC-2

Description

Temporary seeding can be used to stabilize disturbed areas that will be inactive for an extended period. Permanent seeding should be used to stabilize areas at final grade that will not be otherwise stabilized. Effective seeding includes preparation of a seedbed, selection of an appropriate seed mixture, proper planting techniques, and protection of the seeded area with mulch, geotextiles, or other appropriate measures.

Photograph TS/PS -1. Equipment used to drill seed. Photo courtesy of Douglas County.

Appropriate Uses

When the soil surface is disturbed and will remain inactive for an extended period (typically 30 days or longer), proactive stabilization measures should be implemented. If the inactive period is short-lived (on the order of two weeks), techniques such as surface roughening may be appropriate. For longer periods of inactivity, temporary seeding and mulching can provide effective erosion control. Permanent seeding should be used on finished areas that have not been otherwise stabilized.

Typically, local governments have their own seed mixes and timelines for seeding. Check jurisdictional requirements for seeding and temporary stabilization.

Design and Installation

Effective seeding requires proper seedbed preparation, selection of an appropriate seed mixture, use of appropriate seeding equipment to ensure proper coverage and density, and protection with mulch or fabric until plants are established.

The USDCM Volume 2 *Revegetation* Chapter contains detailed seed mix, soil preparations, and seeding and mulching recommendations that may be referenced to supplement this Fact Sheet.

Drill seeding is the preferred seeding method. Hydroseeding is not recommended except in areas where steep slopes prevent use of drill seeding equipment, and even in these instances it is preferable to hand seed and mulch. Some jurisdictions do not allow hydroseeding or hydromulching.

Seedbed Preparation

Prior to seeding, ensure that areas to be revegetated have soil conditions capable of supporting vegetation. Overlot grading can result in loss of topsoil, resulting in poor quality subsoils at the ground surface that have low nutrient value, little organic matter content, few soil microorganisms, rooting restrictions, and conditions less conducive to infiltration of precipitation. As a result, it is typically necessary to provide stockpiled topsoil, compost, or other

Temporary and Permanent Seeding	
Functions	
Erosion Control	Yes
Sediment Control	No
Site/Material Management	No

soil amendments and rototill them into the soil to a depth of 6 inches or more.

Topsoil should be salvaged during grading operations for use and spread on areas to be revegetated later. Topsoil should be viewed as an important resource to be utilized for vegetation establishment, due to its water-holding capacity, structure, texture, organic matter content, biological activity, and nutrient content. The rooting depth of most native grasses in the semi-arid Denver metropolitan area is 6 to 18 inches. At a minimum, the upper 6 inches of topsoil should be stripped, stockpiled, and ultimately respread across areas that will be revegetated.

Where topsoil is not available, subsoils should be amended to provide an appropriate plant-growth medium. Organic matter, such as well digested compost, can be added to improve soil characteristics conducive to plant growth. Other treatments can be used to adjust soil pH conditions when needed. Soil testing, which is typically inexpensive, should be completed to determine and optimize the types and amounts of amendments that are required.

If the disturbed ground surface is compacted, rip or rototill the surface prior to placing topsoil. If adding compost to the existing soil surface, rototilling is necessary. Surface roughening will assist in placement of a stable topsoil layer on steeper slopes, and allow infiltration and root penetration to greater depth.

Prior to seeding, the soil surface should be rough and the seedbed should be firm, but neither too loose nor compacted. The upper layer of soil should be in a condition suitable for seeding at the proper depth and conducive to plant growth. Seed-to-soil contact is the key to good germination.

Seed Mix for Temporary Vegetation

To provide temporary vegetative cover on disturbed areas which will not be paved, built upon, or fully landscaped or worked for an extended period (typically 30 days or more), plant an annual grass appropriate for the time of planting and mulch the planted areas. Annual grasses suitable for the Denver metropolitan area are listed in Table TS/PS-1. These are to be considered only as general recommendations when specific design guidance for a particular site is not available. Local governments typically specify seed mixes appropriate for their jurisdiction.

Seed Mix for Permanent Revegetation

To provide vegetative cover on disturbed areas that have reached final grade, a perennial grass mix should be established. Permanent seeding should be performed promptly (typically within 14 days) after reaching final grade. Each site will have different characteristics and a landscape professional or the local jurisdiction should be contacted to determine the most suitable seed mix for a specific site. In lieu of a specific recommendation, one of the perennial grass mixes appropriate for site conditions and growth season listed in Table TS/PS-2 can be used. The pure live seed (PLS) rates of application recommended in these tables are considered to be absolute minimum rates for seed applied using proper drill-seeding equipment.

If desired for wildlife habitat or landscape diversity, shrubs such as rubber rabbitbrush (*Chrysothamnus nauseosus*), fourwing saltbush (*Atriplex canescens*) and skunkbrush sumac (*Rhus trilobata*) could be added to the upland seedmixes at 0.25, 0.5 and 1 pound PLS/acre, respectively. In riparian zones, planting root stock of such species as American plum (*Prunus americana*), woods rose (*Rosa woodsii*), plains cottonwood (*Populus sargentii*), and willow (*Populus spp.*) may be considered. On non-topsoiled upland sites, a legume such as Ladak alfalfa at 1 pound PLS/acre can be included as a source of nitrogen for perennial grasses.

Seeding dates for the highest success probability of perennial species along the Front Range are generally in the spring from April through early May and in the fall after the first of September until the ground freezes. If the area is irrigated, seeding may occur in summer months, as well. See Table TS/PS-3 for appropriate seeding dates.

Table TS/PS-1. Minimum Drill Seeding Rates for Various Temporary Annual Grasses

Species[a] (Common name)	Growth Season[b]	Pounds of Pure Live Seed (PLS)/acre[c]	Planting Depth (inches)
1. Oats	Cool	35 - 50	1 - 2
2. Spring wheat	Cool	25 - 35	1 - 2
3. Spring barley	Cool	25 - 35	1 - 2
4. Annual ryegrass	Cool	10 - 15	½
5. Millet	Warm	3 - 15	½ - ¾
6. Sudangrass	Warm	5–10	½ - ¾
7. Sorghum	Warm	5–10	½ - ¾
8. Winter wheat	Cool	20–35	1 - 2
9. Winter barley	Cool	20–35	1 - 2
10. Winter rye	Cool	20–35	1 - 2
11. Triticale	Cool	25–40	1 - 2

[a] Successful seeding of annual grass resulting in adequate plant growth will usually produce enough dead-plant residue to provide protection from wind and water erosion for an additional year. This assumes that the cover is not disturbed or mowed closer than 8 inches.

Hydraulic seeding may be substituted for drilling only where slopes are steeper than 3:1 or where access limitations exist. When hydraulic seeding is used, hydraulic mulching should be applied as a separate operation, when practical, to prevent the seeds from being encapsulated in the mulch.

[b] See Table TS/PS-3 for seeding dates. Irrigation, if consistently applied, may extend the use of cool season species during the summer months.

[c] Seeding rates should be doubled if seed is broadcast, or increased by 50 percent if done using a Brillion Drill or by hydraulic seeding.

Table TS/PS-2. Minimum Drill Seeding Rates for Perennial Grasses

Common[a] Name	Botanical Name	Growth Season[b]	Growth Form	Seeds/ Pound	Pounds of PLS/acre
Alakali Soil Seed Mix					
Alkali sacaton	*Sporobolus airoides*	Cool	Bunch	1,750,000	0.25
Basin wildrye	*Elymus cinereus*	Cool	Bunch	165,000	2.5
Sodar streambank wheatgrass	*Agropyron riparium 'Sodar'*	Cool	Sod	170,000	2.5
Jose tall wheatgrass	*Agropyron elongatum 'Jose'*	Cool	Bunch	79,000	7.0
Arriba western wheatgrass	*Agropyron smithii 'Arriba'*	Cool	Sod	110,000	5.5
Total					**17.75**
Fertile Loamy Soil Seed Mix					
Ephriam crested wheatgrass	*Agropyron cristatum 'Ephriam'*	Cool	Sod	175,000	2.0
Dural hard fescue	*Festuca ovina 'duriuscula'*	Cool	Bunch	565,000	1.0
Lincoln smooth brome	*Bromus inermis leyss 'Lincoln'*	Cool	Sod	130,000	3.0
Sodar streambank wheatgrass	*Agropyron riparium 'Sodar'*	Cool	Sod	170,000	2.5
Arriba western wheatgrass	*Agropyron smithii 'Arriba'*	Cool	Sod	110,000	7.0
Total					**15.5**
High Water Table Soil Seed Mix					
Meadow foxtail	*Alopecurus pratensis*	Cool	Sod	900,000	0.5
Redtop	*Agrostis alba*	Warm	Open sod	5,000,000	0.25
Reed canarygrass	*Phalaris arundinacea*	Cool	Sod	68,000	0.5
Lincoln smooth brome	*Bromus inermis leyss 'Lincoln'*	Cool	Sod	130,000	3.0
Pathfinder switchgrass	*Panicum virgatum 'Pathfinder'*	Warm	Sod	389,000	1.0
Alkar tall wheatgrass	*Agropyron elongatum 'Alkar'*	Cool	Bunch	79,000	5.5
Total					**10.75**
Transition Turf Seed Mix[c]					
Ruebens Canadian bluegrass	*Poa compressa 'Ruebens'*	Cool	Sod	2,500,000	0.5
Dural hard fescue	*Festuca ovina 'duriuscula'*	Cool	Bunch	565,000	1.0
Citation perennial ryegrass	*Lolium perenne 'Citation'*	Cool	Sod	247,000	3.0
Lincoln smooth brome	*Bromus inermis leyss 'Lincoln'*	Cool	Sod	130,000	3.0
Total					**7.5**

Table TS/PS-2. Minimum Drill Seeding Rates for Perennial Grasses (cont.)

Common Name	Botanical Name	Growth Season[b]	Growth Form	Seeds/ Pound	Pounds of PLS/acre
Sandy Soil Seed Mix					
Blue grama	*Bouteloua gracilis*	Warm	Sod-forming bunchgrass	825,000	0.5
Camper little bluestem	*Schizachyrium scoparium 'Camper'*	Warm	Bunch	240,000	1.0
Prairie sandreed	*Calamovilfa longifolia*	Warm	Open sod	274,000	1.0
Sand dropseed	*Sporobolus cryptandrus*	Cool	Bunch	5,298,000	0.25
Vaughn sideoats grama	*Bouteloua curtipendula 'Vaughn'*	Warm	Sod	191,000	2.0
Arriba western wheatgrass	*Agropyron smithii 'Arriba'*	Cool	Sod	110,000	5.5
Total					**10.25**
Heavy Clay, Rocky Foothill Seed Mix					
Ephriam crested wheatgrass[d]	*Agropyron cristatum 'Ephriam'*	Cool	Sod	175,000	1.5
Oahe Intermediate wheatgrass	*Agropyron intermedium 'Oahe'*	Cool	Sod	115,000	5.5
Vaughn sideoats grama[e]	*Bouteloua curtipendula 'Vaughn'*	Warm	Sod	191,000	2.0
Lincoln smooth brome	*Bromus inermis leyss 'Lincoln'*	Cool	Sod	130,000	3.0
Arriba western wheatgrass	*Agropyron smithii 'Arriba'*	Cool	Sod	110,000	5.5
Total					**17.5**

[a] All of the above seeding mixes and rates are based on drill seeding followed by crimped straw mulch. These rates should be doubled if seed is broadcast and should be increased by 50 percent if the seeding is done using a Brillion Drill or is applied through hydraulic seeding. Hydraulic seeding may be substituted for drilling only where slopes are steeper than 3:1. If hydraulic seeding is used, hydraulic mulching should be done as a separate operation.

[b] See Table TS/PS-3 for seeding dates.

[c] If site is to be irrigated, the transition turf seed rates should be doubled.

[d] Crested wheatgrass should not be used on slopes steeper than 6H to 1V.

[e] Can substitute 0.5 lbs PLS of blue grama for the 2.0 lbs PLS of Vaughn sideoats grama.

Table TS/PS-3. Seeding Dates for Annual and Perennial Grasses

	Annual Grasses (Numbers in table reference species in Table TS/PS-1)		Perennial Grasses	
Seeding Dates	**Warm**	**Cool**	**Warm**	**Cool**
January 1–March 15			✓	✓
March 16–April 30	4	1,2,3	✓	✓
May 1–May 15	4		✓	
May 16–June 30	4,5,6,7			
July 1–July 15	5,6,7			
July 16–August 31				
September 1–September 30		8,9,10,11		
October 1–December 31			✓	✓

Mulch

Cover seeded areas with mulch or an appropriate rolled erosion control product to promote establishment of vegetation. Anchor mulch by crimping, netting or use of a non-toxic tackifier. See the Mulching BMP Fact Sheet for additional guidance.

Maintenance and Removal

Monitor and observe seeded areas to identify areas of poor growth or areas that fail to germinate. Reseed and mulch these areas, as needed.

An area that has been permanently seeded should have a good stand of vegetation within one growing season if irrigated and within three growing seasons without irrigation in Colorado. Reseed portions of the site that fail to germinate or remain bare after the first growing season.

Seeded areas may require irrigation, particularly during extended dry periods. Targeted weed control may also be necessary.

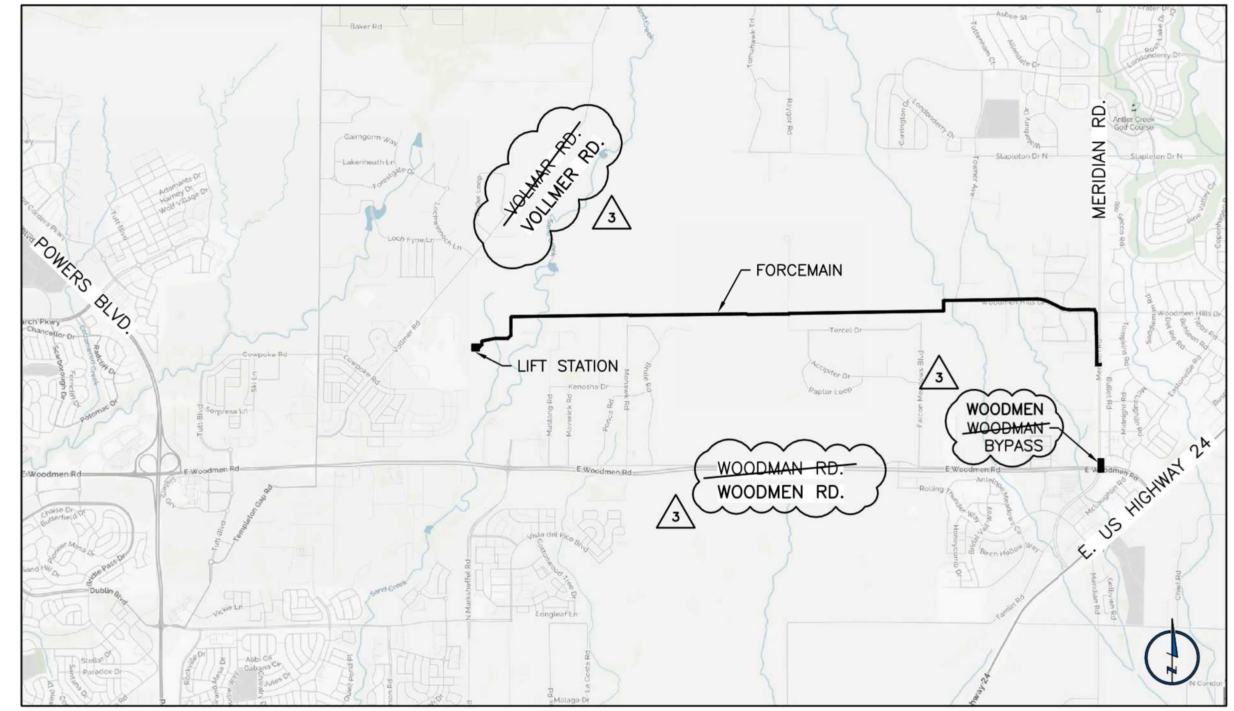
Protect seeded areas from construction equipment and vehicle access.

SWMP GRADING AND EROSION CONTROL PLANS

STERLING RANCH
LIFT STATION AND FORCE MAIN

EL PASO COUNTY, COLORADO

APRIL 24, 2017



LOCATION MAP
N.T.S.

CONTACTS

OWNER:	SR SEWER, LLC 20 BOULDER CRESCENT, STUIE 201 COLORADO SPRINGS, CO 80903 JIM MORLEY 719-471-1742
CIVIL ENGINEER:	LAMP RYNEARSON COMPANIES TZA WATER 12596 W. BAYUAD AVE. SUITE 330 LAKEWOOD, CO 80228 BRAD SIMONS, 303-971-0077
	LARKIN LAMP RYNEARSON 9001 STATE LINE ROAD, SUITE 200 KANSAS CITY, MO 64114 ISAAC CRABTREE, 816-361-0440
	LAMP RYNEARSON & ASSOCIATES, INC. 4715 INNOVATION DR., SUITE 100 FORT COLLINS, CO 80525 SHAR SHADOWEN, 970-226-0342
	LAMP RYNEARSON & ASSOCIATES, INC. 14710 W. DODGE ROAD, #100 OMAHA, NE 68154 ~~JOHN HILL, 402-496-2498~~
PROJECT MANAGER:	MMI WATER ENGINEERS, LLC 7262 S. GARRISON COURT LITTLETON, CO 80128 BRADLEY A. SIMONS, P.E., 720-234-8398
TRAFFIC ENGINEERING:	EL PASO COUNTY PUBLIC SERVICES & TRANSPORTATION DEPARTMENT 3275 AKERS DRIVE COLORADO SPRINGS, CO 80922 ANDRE BRACKIN, P.E. 719-668-8769
GAS:	CITY OF COLORADO SPRINGS
GAS:	COLORADO INTERSTATE GAS
GAS:	MAGELLAN MIDSTREAM
FORCE MAIN & SEWER	STERLING RANCH METROPOLITAN DISTRICT NO. 1
~~ELECTRIC:~~	~~MOUNTAIN VIEW ELECTRIC~~
SANITARY SEWER SERVICE PROVIDER:	MERIDIAN SERVICE METROPOLITAN DISTRICT 11886 STAPLETON DRIVE FALCON, CO 80831 BRADEN McCRORY 719-495-6567

2 2 2

EROSION CONTROL STATEMENT:

ENGINEER'S STATEMENT:

THIS EROSION AND STORMWATER QUALITY CONTROL/GRADING PLAN WAS PREPARED UNDER MY DIRECTION AND SUPERVISION AND IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. IF SUCH WORK IS PERFORMED IN ACCORDANCE WITH THE GRADING AND EROSION CONTROL PLAN, THE WORK WILL NOT BECOME A HAZARD TO LIFE AND LIMB, ENDANGER PROPERTY, OR ADVERSELY AFFECT THE SAFETY, USE OR STABILITY OF A PUBLIC WAY, DRAINAGE CHANNEL OR OTHER PROPERTY.

____
ENGINEER, COLORADO P.E. #__________.

PROJECT CONTROL

HORIZONTAL CONTROL:

N 1/4 CORNER, SEC 3, T13S, R65W
NORTHING: 410191.1110
EASTING: 241732.9390
ELEVATION: 7010.07
DESCRIPTION: 2 1/2" ALUM CAP W/ 2" ALUM PIPE, LS 11624

NW CORNER, SEC 3, T13S, R65W
NORTHING: 410154.8270
EASTING : 239010.5240
ELEVATION: 7028.15
DESCRIPTION: 2 1/2" ALUM CAP W/ 3/4" REBAR, LS 11624

VERTICAL DATUM:

STERLING RANCH DEVELOPMENT BENCHMARK
NORTHING: 413533.64
EASTING: 235994.01
ELEVATION: 7076.93
DESCRIPTION: 1/2" REBAR WITH 1" PLASTIC CAP

FORCE MAIN & SEWER MAIN EXTENSIONS

ANY CHANGE OR ALTERATIONS AFFECTING THE GRADING, ALIGNMENT, ELEVATION AND/OR DEPTH OF COVER OF ANY FORCE MAIN, SEWER MAINS OR OTHER APPURTENANCES SHOWN ON THIS DRAWING SHALL BE THE RESPONSIBILITY OF THE OWNER/DEVELOPER. THE OWNER/DEVELOPER SHALL BE RESPONSIBLE FOR ALL OPERATION DAMAGE AND DEFECTS IN INSTALLATION AND MATERIAL FOR MAINS AND SERVICES FROM THE DATE OF APPROVAL UNTIL FINAL ACCEPTANCE IS ISSUED.

SIGNED: ______________________ DATE:__________
OWNER/DEVELOPER

PRINT NAME: JAMES F. MORLEY

DBA: SR SEWER LLC

ADDRESS: 20 BOULDER CRESCENT #200
COLORADO SPRINGS, COLORADO 80903

DISTRICT APPROVAL

THE STERLING RANCH METROPOLITAN DISTRICT RECOGNIZED THE DESIGN ENGINEER AS HAVING RESPONSIBILITY FOR THE DESIGN AND HAS LIMITED ITS SCOPE OF REVIEW ACCORDINGLY.

STERLING RANCH METROPOLITAN DISTRICT
WASTEWATER DESIGN APPROVAL

SIGNED: ______________________ DATE:__________
DISTRICT ENGINEER

PROJECT NO. ______________________

DEVELOPER'S STATEMENT – EROSION CONTROL

THE OWNER WILL COMPLY WITH THE REQUIREMENTS OF THE EROSION AND STORMWATER QUALITY CONTROL PLAN INCLUDING TEMPORARY BMP INSPECTION REQUIREMENTS AND FINAL STABILIZATION REQUIREMENTS. I ACKNOWLEDGE THE RESPONSIBILITY TO DETERMINE WHETHER THE CONSTRUCTION ACTIVITIES ON THIS PLAN REQUIRE COLORADO DISCHARGE PERMIT SYSTEM (CDPS) PERMITTING FOR STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY.

BY: ______________________
JAMES F. MORLEY

DBA: SR SEWER LLC

TITLE: PRESIDENT

ADDRESS: 20 BOULDER CRESCENT #200
COLORADO SPRINGS, COLORADO 80903

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MERIDIAN SERVICE METROPOLITAN DISTRICT APPROVAL

THE MERIDIAN SERVICE METROPOLITAN DISTRICT HAS REVIEWED THESE PLANS PREPARED BY LAMP RYNEARSON & ASSOCIATES AND AMENDED BY MMI WATER ENGINEERS, LLC.

SIGNED: ______________________ DATE:__________
THOMAS A. KERBY, P.E. – DISTRICT ENGINEER

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EL PASO COUNTY STANDARD CD SIGNATURE BLOCK:

COUNTY PLAN REVIEW IS PROVIDED ONLY FOR GENERAL CONFORMANCE WITH COUNTY DESIGN CRITERIA. THE COUNTY IS NOT RESPONSIBLE FOR THE ACCURACY AND ADEQUACY OF THE DESIGN, DIMENSIONS, AND/OR ELEVATIONS WHICH SHALL BE CONFIRMED AT THE JOB SITE. THE COUNTY THROUGH THE APPROVAL OF THIS DOCUMENT ASSUMES NO RESPONSIBILITY FOR COMPLETENESS AND/OR ACCURACY OF THIS DOCUMENT.

FILED IN ACCORDANCE WITH THE REQUIREMENTS OF THE EL PASO COUNTY LAND DEVELOPMENT CODE, DRAINAGE CRITERIA MANUAL, VOLUMES 1 AND 2, AND ENGINEERING CRITERIA MANUAL AS AMENDED.

IN ACCORDANCE WITH ECM SECTION 1.12, THESE CONSTRUCTION DOCUMENTS WILL BE VALID FOR CONSTRUCTION FOR A PERIOD OF 2 YEARS FROM THE DATE SIGNED BY THE EL PASO COUNTY ENGINEER. IF CONSTRUCTION HAS NOT STARTED WITHIN THOSE 2 YEARS, THE PLANS WILL NEED TO BE RESUBMITTED FOR APPROVAL, INCLUDING PAYMENT OF REVIEW FEES AT THE PLANNING AND COMMUNITY DEVELOPMENT DIRECTORS DISCRETION.

______________________ __________
JENNIFER IRVINE, P.E. DATE
COUNTY ENGINEER / ECM ADMINISTRATOR

INDEX OF SHEETS

LAMP RYNEARSON & ASSOCIATES
12596 West Bayaud Avenue, Suite 330
Lakewood, Colorado 80228
LRA-Inc.com / tza4water.com
303.971.0030 | P
303.971.0077 | F

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MMI water engineers

COLORADO 811 KNOW WHAT'S BELOW CALL BEFORE YOU DIG.

STANDARD NOTES:

1. CONSTRUCTION MAY NOT COMMENCE UNTIL A CONSTRUCTION PERMIT IS OBTAINED FROM PLANNING AND COMMUNITY DEVELOPMENT (PCD) AND A PRECONSTRUCTION CONFERENCE IS HELD WITH PCD INSPECTIONS.
2. STORMWATER DISCHARGES FROM CONSTRUCTION SITES SHALL NOT CAUSE OR THREATEN TO CAUSE POLLUTION, CONTAMINATION, OR DEGRADATION OF STATE WATERS. ALL WORK AND EARTH DISTURBANCE SHALL BE DONE IN A MANNER THAT MINIMIZES POLLUTION OF ANY ON-SITE OR OFF SITE WATERS, INCLUDING WETLANDS.
3. NOTWITHSTANDING ANYTHING DEPICTED IN THESE PLANS IN WORDS OR GRAPHIC REPRESENTATION, ALL DESIGN AND CONSTRUCTION RELATED TO ROADS, STORM DRAINAGE AND EROSION CONTROL SHALL CONFORM TO THE STANDARDS AND REQUIREMENTS OF THE MOST RECENT VERSION OF THE RELEVANT ADOPTED EL PASO COUNTY STANDARDS, INCLUDING THE LAND DEVELOPMENT CODE, THE ENGINEERING CRITERIA MANUAL, THE DRAINAGE CRITERIA MANUAL, AND THE DRAINAGE CRITERIA MANUAL VOLUME 2. ANY DEVIATIONS FROM REGULATIONS AND STANDARDS MUST BE REQUESTED, AND APPROVED, IN WRITING.
4. A SEPARATE STORMWATER MANAGEMENT PLAN (SWMP) FOR THIS PROJECT SHALL BE COMPLETED AND AN EROSION AND STORMWATER QUALITY CONTROL PERMIT (ESQCP) ISSUED PRIOR TO COMMENCING CONSTRUCTION. DURING CONSTRUCTION THE SWMP IS THE RESPONSIBILITY OF THE DESIGNATED STORMWATER MANAGER, SHALL BE LOCATED ON SITE AT ALL TIMES AND SHALL BE KEPT UP TO DATE WITH WORK PROGRESS AND CHANGES IN THE FIELD.
5. ONCE THE ESQCP HAS BEEN ISSUED, THE CONTRACTOR MAY INSTALL THE INITIAL STAGE EROSION AND SEDIMENT CONTROL BMPS AS INDICATED ON THE GEC. A PRECONSTRUCTION MEETING BETWEEN THE CONTRACTOR, ENGINEER, AND EL PASO COUNTY WILL BE HELD PRIOR TO ANY CONSTRUCTION. IT IS THE RESPONSIBILITY OF THE APPLICANT TO COORDINATE THE MEETING TIME AND PLACE WITH COUNTY PCD INSPECTIONS STAFF.
6. SOIL EROSION CONTROL MEASURES FOR ALL SLOPES, CHANNELS, DITCHES, OR ANY DISTURBED LAND AREA SHALL BE COMPLETED WITHIN 21 CALENDAR DAYS AFTER FINAL GRADING, OR FINAL EARTH DISTURBANCE, HAS BEEN COMPLETED. DISTURBED AREAS AND STOCKPILES WHICH ARE NOT AT FINAL GRADE BUT WILL REMAIN DORMANT FOR LONGER THAN 30 DAYS SHALL ALSO BE MULCHED WITHIN 21 DAYS AFTER INTERIM GRADING. AN AREA THAT IS GOING TO REMAIN IN AN INTERIM STATE FOR MORE THAN 60 DAYS SHALL ALSO BE SEEDED. ALL TEMPORARY SOIL EROSION CONTROL MEASURES AND BMPS SHALL BE MAINTAINED UNTIL PERMANENT SOIL EROSION CONTROL MEASURES ARE IMPLEMENTED AND ESTABLISHED.
7. TEMPORARY SOIL EROSION CONTROL FACILITIES SHALL BE REMOVED AND EARTH DISTURBANCE AREAS GRADED AND STABILIZED WITH PERMANENT SOIL EROSION CONTROL MEASURES PURSUANT TO STANDARDS AND SPECIFICATION PRESCRIBED IN THE DCM VOLUME II AND THE ENGINEERING CRITERIA MANUAL (ECM) APPENDIX I.
8. ALL PERSONS ENGAGED IN EARTH DISTURBANCE SHALL IMPLEMENT AND MAINTAIN ACCEPTABLE SOIL EROSION AND SEDIMENT CONTROL MEASURES INCLUDING BMPS IN CONFORMANCE WITH THE EROSION CONTROL TECHNICAL STANDARDS OF THE DRAINAGE CRITERIA MANUAL (DCM) VOLUME II AND IN ACCORDANCE WITH THE STORMWATER MANAGEMENT PLAN (SWMP).
9. ALL TEMPORARY EROSION CONTROL FACILITIES INCLUDING BMPS AND ALL PERMANENT FACILITIES INTENDED TO CONTROL EROSION OF ANY EARTH DISTURBANCE OPERATIONS SHALL BE INSTALLED AS DEFINED IN THE APPROVED PLANS, THE SWMP AND THE DCM VOLUME II AND MAINTAINED THROUGHOUT THE DURATION OF THE EARTH DISTURBANCE OPERATION.
10. ANY EARTH DISTURBANCE SHALL BE CONDUCTED IN SUCH A MANNER SO AS TO EFFECTIVELY REDUCE ACCELERATED SOIL EROSION AND RESULTING SEDIMENTATION. ALL DISTURBANCES SHALL BE DESIGNED, CONSTRUCTED, AND COMPLETED SO THAT THE EXPOSED AREA OF ANY DISTURBED LAND SHALL BE LIMITED TO THE SHORTEST PRACTICAL PERIOD OF TIME.
11. ANY TEMPORARY OR PERMANENT FACILITY DESIGNED AND CONSTRUCTED FOR THE CONVEYANCE OF STORMWATER AROUND, THROUGH, OR FROM THE EARTH DISTURBANCE AREA SHALL BE DESIGNED TO LIMIT THE DISCHARGE TO A NON-EROSIVE VELOCITY.
12. CONCRETE WASH WATER SHALL BE CONTAINED AND DISPOSED OF IN ACCORDANCE WITH THE SWMP. NO WASH WATER SHALL BE DISCHARGED TO OR ALLOWED TO RUNOFF TO STATE WATERS, INCLUDING ANY SURFACE OR SUBSURFACE STORM DRAINAGE SYSTEM OR FACILITIES.
13. EROSION CONTROL BLANKETING SHALL BE USED ON SLOPES STEEPER THAN 3:1.
14. BUILDING, CONSTRUCTION, EXCAVATION, OR OTHER WASTE MATERIALS SHALL NOT BE TEMPORARILY PLACED OR STORED IN THE STREET, ALLEY, OR OTHER PUBLIC WAY, UNLESS IN ACCORDANCE WITH AN APPROVED TRAFFIC CONTROL PLAN. BMP'S MAY BE REQUIRED BY EL PASO COUNTY ENGINEERING IF DEEMED NECESSARY, BASED ON SPECIFIC CONDITIONS AND CIRCUMSTANCES.
15. VEHICLE TRACKING OF SOILS AND CONSTRUCTION DEBRIS OFF-SITE SHALL BE MINIMIZED. MATERIALS TRACKED OFFSITE SHALL BE CLEANED UP AND PROPERLY DISPOSED OF IMMEDIATELY.
16. CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL WASTES FROM THE CONSTRUCTION SITE FOR DISPOSAL IN ACCORDANCE WITH LOCAL AND STATE REGULATORY REQUIREMENTS. NO CONSTRUCTION DEBRIS, TREE SLASH, BUILDING MATERIAL WASTES OR UNUSED BUILDING MATERIALS SHALL BE BURIED, DUMPED, OR DISCHARGED AT THE SITE.
17. THE OWNER, SITE DEVELOPER, CONTRACTOR, AND/OR THEIR AUTHORIZED AGENTS SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL CONSTRUCTION DEBRIS, DIRT, TRASH, ROCK, SEDIMENT, AND SAND THAT MAY ACCUMULATE IN THE STORM SEWER OR OTHER DRAINAGE CONVEYANCE SYSTEM AND STORMWATER APPURTENANCES AS A RESULT OF SITE DEVELOPMENT.
18. THE QUANTITY OF MATERIALS STORED ON THE PROJECT SITE SHALL BE LIMITED, AS MUCH AS PRACTICAL, TO THAT QUANTITY REQUIRED TO PERFORM THE WORK IN AN ORDERLY SEQUENCE. ALL MATERIALS STORED ON-SITE SHALL BE STORED IN A NEAT, ORDERLY MANNER, IN THEIR ORIGINAL CONTAINERS, WITH ORIGINAL MANUFACTURER'S LABELS.
19. NO CHEMICALS ARE TO BE USED BY THE CONTRACTOR, WHICH HAVE THE POTENTIAL TO BE RELEASED IN STORMWATER UNLESS PERMISSION FOR THE USE OF A SPECIFIC CHEMICAL IS GRANTED IN WRITING BY THE ECM ADMINISTRATOR. IN GRANTING THE USE OF SUCH CHEMICALS, SPECIAL CONDITIONS AND MONITORING MAY BE REQUIRED.
20. BULK STORAGE STRUCTURES FOR PETROLEUM PRODUCTS AND OTHER CHEMICALS SHALL HAVE ADEQUATE PROTECTION SO AS TO CONTAIN ALL SPILLS AND PREVENT ANY SPILLED MATERIAL FROM ENTERING STATE WATERS, INCLUDING ANY SURFACE OR SUBSURFACE STORM DRAINAGE SYSTEM OR FACILITIES.
21. NO PERSON SHALL CAUSE THE IMPEDIMENT OF STORMWATER FLOW IN THE FLOW LINE OF THE CURB AND GUTTER OR IN THE DITCH LINE.
22. INDIVIDUALS SHALL COMPLY WITH THE "COLORADO WATER QUALITY CONTROL ACT" (TITLE 25, ARTICLE 8, CRS), AND THE "CLEAN WATER ACT" (33 USC 1344), IN ADDITION TO THE REQUIREMENTS INCLUDED IN THE DCM VOLUME II AND THE ECM APPENDIX I. ALL APPROPRIATE PERMITS MUST BE OBTAINED BY THE CONTRACTOR PRIOR TO CONSTRUCTION (NPDES, FLOODPLAIN, 404, FUGITIVE DUST, ETC.). IN THE EVENT OF CONFLICTS BETWEEN THESE REQUIREMENTS AND LAWS, RULES, OR REGULATIONS OF OTHER FEDERAL, STATE, OR COUNTY AGENCIES, THE MORE RESTRICTIVE LAWS, RULES, OR REGULATIONS SHALL APPLY.
23. ALL CONSTRUCTION TRAFFIC MUST ENTER/EXIT THE SITE AT APPROVED CONSTRUCTION ACCESS POINTS.
24. PRIOR TO ACTUAL CONSTRUCTION THE PERMITTEE SHALL VERIFY THE LOCATION OF EXISTING UTILITIES.
25. A WATER SOURCE SHALL BE AVAILABLE ON SITE DURING EARTHWORK OPERATIONS AND UTILIZED AS REQUIRED TO MINIMIZE DUST FROM EARTHWORK EQUIPMENT AND WIND.
26. THE SOILS REPORT FOR THIS SITE HAS BEEN PREPARED BY ___________ AND SHALL BE CONSIDERED A PART OF THESE PLANS.
27. AT LEAST TEN DAYS PRIOR TO THE ANTICIPATED START OF CONSTRUCTION, FOR PROJECTS THAT WILL DISTURB 1 ACRE OR MORE, THE OWNER OR OPERATOR OF CONSTRUCTION ACTIVITY SHALL SUBMIT A PERMIT APPLICATION FOR STORMWATER DISCHARGE TO THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT, WATER QUALITY DIVISION. THE APPLICATION CONTAINS CERTIFICATION OF COMPLETION OF A STORMWATER MANAGEMENT PLAN (SWMP), OF WHICH THIS GRADING AND EROSION CONTROL PLAN MAY BE A PART. FOR INFORMATION OR APPLICATION MATERIALS CONTACT:

   COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT
   WATER QUALITY CONTROL DIVISION
   WQCD – PERMITS
   4300 CHERRY CREEK DRIVE SOUTH
   DENVER, CO 80246-1530
   ATTN: PERMITS UNIT

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EROSION CONTROL NOTES:

1. STORMWATER DISCHARGES FROM CONSTRUCTION SITES SHALL NOT CAUSE OR THREATEN TO CAUSE POLLUTION, CONTAMINATION, OR DEGRADATION OF STATE WATERS. ALL WORK AND EARTH DISTURBANCE SHALL BE DONE IN A MANNER THAT MINIMIZES POLLUTION OF ANY ON-SITE OR OFF SITE WATERS, INCLUDING WETLANDS.
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3. A SEPARATE STORMWATER MANAGEMENT PLAN (SMWP) FOR THIS PROJECT SHALL BE COMPLETED AND AN EROSION AND STORMWATER QUALITY CONTROL PERMIT (ESQCP) ISSUED PRIOR TO COMMENCING CONSTRUCTION. DURING CONSTRUCTION THE SWMP IS THE RESPONSIBILITY OF THE DESIGNATED STORMWATER MANAGER, SHALL BE LOCATED ON SITE AT ALL TIMES AND SHALL BE KEPT UP TO DATE WITH WORK PROGRESS AND CHANGES IN THE FIELD.
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5. SOIL EROSION CONTROL MEASURES FOR ALL SLOPES, CHANNELS, DITCHES, OR ANY DISTURBED LAND AREA SHALL BE COMPLETED WITHIN 21 CALENDAR DAYS AFTER FINAL GRADING, OR FINAL EARTH DISTURBANCE, HAS BEEN COMPLETED. DISTURBED AREAS AND STOCKPILES WHICH ARE NOT AT FINAL GRADE BUT WILL REMAIN DORMANT FOR LONGER THAN 30 DAYS SHALL ALSO BE MULCHED WITHIN 21 DAYS AFTER INTERIM GRADING. AN AREA THAT IS GOING TO REMAIN IN AN INTERIM STATE FOR MORE THAN 60 DAYS SHALL ALSO BE SEEDED. ALL TEMPORARY SOIL EROSION CONTROL MEASURES AND BMPS SHALL BE MAINTAINED UNTIL PERMANENT SOIL EROSION CONTROL MEASURES ARE IMPLEMENTED AND ESTABLISHED.
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20. INDIVIDUALS SHALL COMPLY WITH THE "COLORADO WATER QUALITY CONTROL ACT" (TITLE 25, ARTICLE 8, CRS), AND THE "CLEAN WATER ACT" (33 USC 1344), IN ADDITION TO THE REQUIREMENTS INCLUDED IN THE DCM VOLUME II AND THE ECM APPENDIX I. ALL APPROPRIATE PERMITS MUST BE OBTAINED BY THE CONTRACTOR PRIOR TO CONSTRUCTION (NPDES, FLOODPLAIN, 404, FUGITIVE DUST, ETC.). IN THE EVENT OF CONFLICTS BETWEEN THESE REQUIREMENTS AND LAWS, RULES, OR REGULATIONS OF OTHER FEDERAL, STATE, OR COUNTY AGENCIES, THE MORE RESTRICTIVE LAWS, RULES, OR REGULATIONS SHALL APPLY.
21. ALL CONSTRUCTION TRAFFIC MUST ENTER/EXIT THE SITE AT APPROVED CONSTRUCTION ACCESS POINTS.
22. PRIOR TO ACTUAL CONSTRUCTION THE PERMITEE SHALL VERIFY THE LOCATION OF EXISTING UTILITIES.
23. A WATER SOURCE SHALL BE AVAILABLE ON SITE DURING EARTHWORK OPERATIONS AND UTILIZED AS REQUIRED TO MINIMIZE DUST FROM EARTHWORK EQUIPMENT AND WIND.
24. THE SOILS REPORT FOR THIS SITE HAS BEEN PREPARED BY ENTECH ENGINEERING, INC. AND SHALL BE CONSIDERED A PART OF THESE PLANS.
25. AT LEAST TEN DAYS PRIOR TO THE ANTICIPATED START OF CONSTRUCTION, FOR PROJECTS THAT WILL DISTURB 1 ACRE OR MORE, THE OWNER OR OPERATOR OF CONSTRUCTION ACTIVITY SHALL SUBMIT A PERMIT APPLICATION FOR STORMWATER DISCHARGE TO THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT, WATER QUALITY DIVISION. THE APPLICATION CONTAINS CERTIFICATION OF COMPLETION OF A STORMWATER MANAGEMENT PLAN (SWMP), OF WHICH THIS GRADING AND EROSION CONTROL PLAN MAY BE A PART. FOR INFORMATION OR APPLICATION MATERIALS CONTACT:

   COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT
   WATER QUALITY CONTROL DIVISION
   WQCD – PERMITS
   4300 CHERRY CREEK DRIVE SOUTH
   DENVER, CO 80246-1530
   ATTN: PERMITS UNIT

GENERAL NOTES:

1. ALL STATIONING IS CENTER LINE UNLESS OTHERWISE NOTED. ALL ELEVATIONS ARE CENTER LINE UNLESS OTHERWISE NOTED.
2. ALL MATERIALS AND WORKMANSHIP SHALL BE SUBJECT TO INSPECTION BY THE DISTRICT. THE DISTRICT RESERVES THE RIGHT TO ACCEPT OR REJECT ANY SUCH MATERIALS AND WORKMANSHIP THAT DOES NOT CONFORM TO ITS STANDARDS AND SPECIFICATIONS.
3. COMPACTION TESTS SHALL BE 95% STANDARD PROCTOR AS DETERMINED BY ASTM D698, UNLESS OTHERWISE APPROVED BY THE DISTRICT OR HIGHER STANDARD AS IMPOSED BY OTHER AGENCIES HAVING RIGHT-OF-WAY JURISDICTION. THIS SHALL INCLUDE ALL VALVES, FIRE HYDRANT RUNS, WATER & SEWER SERVICE LINES AND MANHOLES. ALL REPORTS SHALL BE SUBMITTED TO THE DISTRICT FOR REVIEW AND APPROVAL. MOISTURE CONTENT SHALL BE AS OUTLINED IN THE GEOTECHNICAL REPORT.
4. THE LOCATION OF ALL EXISTING UTILITIES SHOWN ON THE DRAWINGS ARE APPROXIMATE ONLY. THE LOCATION OF ALL UTILITIES SHALL BE FIELD VERIFIED PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES. THE DISTRICT SHALL BE NOTIFIED OF ANY DEVIATIONS TO THE LINE AND/OR GRADE AS DEPICTED ON THE PLANS. CONTRACTOR SHALL SUBMIT TO THE DISTRICT AND THE ENGINEER OF RECORD A REPORT OF THE FIELD VERIFIED INFORMATION PRIOR TO THE START OF CONSTRUCTION.
5. ALL PIPELINES, BENDS, AIR RELEASES, MANHOLES, TEST STATIONS, STRUCTURES, FENCES AND OTHER PERTINENT DESIGN COMPONENTS SHALL BE FIELD STAKED PRIOR TO THE START OF CONSTRUCTION.
6. BENDS, DEFLECTION & CUT PIPE LENGTHS SHALL BE USED TO HOLD HORIZONTAL ALIGNMENT OF SEWER AND WATER LINES TO NO MORE THAN 0.5' FROM THE DESIGNED ALIGNMENT. CONSTRUCTION STAKES TO BE AT 25' INTERVALS ALONG CURVES TO ASSURE LOCATION OF PIPE LINE CONSTRUCTION.
7. ALL UNUSED SALVAGED UTILITY MATERIAL SHALL BE RETURNED TO THE TOWN OF KEENESBURG AS REQUESTED.
8. AT THE CONTRACTOR'S EXPENSE, ALL UTILITY MAINS SHALL BE SUPPORTED AND PROTECTED SUCH THAT THEY SHALL FUNCTION CONTINUOUSLY DURING CONSTRUCTION OPERATIONS. SHOULD A UTILITY MAIN FAIL AS A RESULT OF THE CONTRACTOR'S OPERATION, IT SHALL BE REPLACED IMMEDIATELY BY THE CONTRACTOR OR BY THE DISTRICT AT FULL COST OF LABOR AND MATERIALS TO THE CONTRACTOR.
9. PUMPING OR BYPASS OPERATIONS SHALL BE REVIEWED AND APPROVED BY BOTH THE DISTRICT AND THE DISTRICT ENGINEER PRIOR TO EXECUTION.
10. THE CONTRACTOR SHALL REPLACE OR REPAIR DAMAGE TO ALL SURFACE IMPROVEMENTS, INCLUDING BUT NOT LIMITED TO FENCES, LANDSCAPING, CURB AND GUTTER AND/OR ASPHALT THAT MAY BE CAUSED DURING CONSTRUCTION.
11. ALL CONTRACTORS WORKING ON OR NEAR A WATER OR SEWER FACILITY (TO INCLUDE SERVICE LINES) SHALL HAVE LIABILITY INSURANCE NAMING THE DISTRICT AS AN ADDITIONAL INSURED AND SHALL PROVIDE A CURRENT COPY OF WORKERS COMPENSATION INSURANCE ON FILE WITH THE DISTRICT. NO WORK CAN PROCEED WITHOUT CURRENT CERTIFICATES ON FILE AT THE DISTRICT'S OFFICE.
12. THE CONTRACTOR SHALL NOTIFY THE DISTRICT AND ALL AFFECTED UTILITY COMPANIES ADJACENT TO THE PROPOSED UTILITY CONSTRUCTION A MINIMUM OF 48 HOURS AND A MAXIMUM OF 96 HOURS PRIOR TO THE START OF CONSTRUCTION. A WEEKLY CONSTRUCTION MEETING SHALL BE REQUIRED WITH THE CONTRACTOR, DISTRICT ENGINEER AND ALL OTHER PARTIES AS DEEMED NECESSARY BY THE DISTRICT.
13. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS FROM ALL JURISDICTIONS REQUIRED FOR THIS PROJECT.

TESTING OF FACILITIES:

14. THE CONTRACTOR SHALL NOTIFY THE DISTRICT A MINIMUM OF 48 HOURS AND A MAXIMUM OF 96 HOURS PRIOR TO THE START OF ANY TESTING.
15. ALL SECTIONS OF FORCE MAIN ARE TO MEET THE FOLLOWING PRESSURE TESTING REQUIREMENTS:
    - TEST 100% OF ALL LINES
    - MUST PASS PRESSURE TEST TO 200 PSI FOR TWO HOURS (UNLESS OTHERWISE APPROVED ON THE PLANS).

19. ALL SANITARY SEWER FACILITIES ARE TO MEET THE FOLLOWING TESTING REQUIREMENTS:
    - ALL LINES SHALL BE JET CLEANED PRIOR TO VACUUM OR PRESSURE TESTING.
    - ALL MANHOLES SHALL BE VACUUM TESTED WITH DISTRICT STAFF PRESENT PRIOR TO CCTV INSPECTION.
    - SEWER MAINS TO BE PRESSURE TEST PRIOR TO CCTV INSPECTION.
    - ALL LINES SHALL BE CCTV INSPECTED AND VIDEO SHALL TO BE SUBMITTED TO THE DISTRICT FOR REVIEW AND APPROVAL.

ACCEPTANCE:

25. PRELIMINARY ACCEPTANCE SHALL BE DEFINED AS THE POINT IN TIME THAT THE DISTRICT ACCEPTS THE FACILITY FOR USE. ALL SURFACE IMPROVEMENTS AND RESTORATION SHALL BE COMPLETED WITHIN 30 DAYS OF COMMENCEMENT. SHOULD THE CONTRACTOR FAIL TO COMPLETE ALL SURFACE IMPROVEMENTS AND RESTORATION WITHIN 30 DAYS OF COMMENCEMENT OF SERVICE, THE DISTRICT, AT THEIR DISCRETION, MAY ELECT TO COMPLETE THE IMPROVEMENTS AT THE CONTRACTORS COST.
26. ALL FORCE MAINS AND SEWER MAINS, INCLUDING SERVICE LINES, SHALL HAVE "AS-BUILT" DRAWINGS PREPARED AND APPROVED PRIOR TO PRELIMINARY ACCEPTANCE BY THE DISTRICT.

FORCE MAIN SYSTEM INSTALLATION NOTES:

1. ALL TEST STATIONS AND ASSOCIATED APPURTENCES WITH THE FORCE MAIN SYSTEM SHALL BE MARKED WITH CARSONITE MARKERS AS APPLICABLE.
2. ANY REQUIRED REALIGNMENT (HORIZONTAL OR VERTICAL) SHALL BE REVIEWED AND APPROVED BY THE DISTRICT.
3. ALL MAIN LINES (PVC, HDPE & DUCTILE IRON) SHALL BE INSTALLED WITH COATED #12 TRACER WIRE WITH TEST STATIONS AT INTERVALS NO GREATER THAN 1,000 FEET OR AS SHOWN (VALVE BOXES CAN BE USED AT INTERSECTIONS AND SERVICE STUBS).

COMMENCEMENT OF USE OF WATER LINES AND/OR SYSTEMS:

4. NO WATER OR FORCE MAIN FACILITY SHALL BE PLACED IN SERVICE UNTIL AFTER THE COMPLETION OF ALL PRESSURE TESTING, FLUSHING, BAC-T TESTING, COMPACTION TESTING, AND AS-BUILT DRAWINGS ARE SUBMITTED AND APPROVED BY THE DISTRICT.
5. NO FORCE MAIN FACILITY SHALL BE PLACED IN SERVICE UNTIL ALL SURFACE IMPROVEMENTS ARE COMPLETED.
6. ALL EASEMENTS (PLATTED OR DEEDED) ARE DEDICATED, EXECUTED BY THE DISTRICT, AND RECORDED.

SANITARY SEWER SYSTEM INSTALLATION NOTES:

1. SANITARY SEWER LENGTHS ARE MH CENTER-MH CENTER. ALL SANITARY SEWER PIPES SHALL BE SDR 35 PVC OR EQUAL. SEWER LINES MAY NOT EXCEED 7% GRADE FOR ANY SIZE WITHOUT PRIOR APPROVAL OF THE TOWN OF KEENESBURG.
2. ALL SANITARY SEWER MANHOLES SHALL BE WRAPPED WITH RU116 RUBR-NEK JOINT WRAP OR EQUIVALENT AND COATED.

COMMENCEMENT OF USE OF SEWER LINES AND/OR SYSTEMS:

3. NO SANITARY SEWER FACILITY SHALL BE PLACED IN SERVICE UNTIL THE COMPLETION OF ALL JET CLEANING, PRESSURE TESTING, VACUUM TESTING, CCTV INSPECTION, COMPACTION TESTING, AND AS-BUILT DRAWINGS ARE SUBMITTED AND APPROVED BY THE DISTRICT.
4. NO SANITARY SEWER FACILITY SHALL BE PLACED IN SERVICE UNTIL ALL SURFACE IMPROVEMENTS ARE COMPLETED.
5. ALL NECESSARY EASEMENTS (PLATTED OR DEEDED) ARE DEDICATED, EXECUTED BY THE DISTRICT, AND RECORDED.

DRAWN BY	JPM
DESIGNED BY	JPM
DATE	APRIL 24, 2017
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BOOK AND PAGE	

REVISIONS
3 – PER EPC COMMENTS – 05/31/2019

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STERLING RANCH LIFT STATION AND FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

FORCE MAIN
GENERAL NOTES

LAMP RYNEARSON - ENGINEERS

PRELIMINARY

BRADLEY A. SIMONS
34705

SHEET
G0.2

EXISTING LINE LEGEND

- ADJACENT LOT LINE
- EXISTING ELECTRIC
- EXISTING STORM SEWER
- EDGE PAVEMENT OR GRAVEL
- EXISTING FIBER OPTIC
- EXISTING TELEPHONE
- PROPERTY LINE
- EXISTING FLOWLINE
- EXISTING WATER
- SECTION LINE
- EXISTING GAS
- EXISTING WIRE FENCE
- EXISTING CABLE TELEVISION
- EXISTING OVERHEAD POWER
- EXISTING EASEMENT
- EXISTING SANITARY SEWER

EXISTING SYMBOL LEGEND & CODE ABBREVIATIONS

SYMBOL	DESCRIPTION	CODE ABBREVIATIONS
	BUILDING, A/C	BAC
	BUILDING, ROOF DRAIN	BRD
	BRIDGE, LOW CHORD	BRLC
	DRAINAGE, AREA INLET, ROUND	DAIR
	DRAINAGE, AREA INLET, SQUARE	DAIS
RCB	DRAINAGE, MANHOLE	DMH
	DRAINAGE, STORM, FES	DSF
	DRAINAGE, STORM, PIPE	DSP
	GROUND, BORE HOLE	GBH
	LANDSCAPE, BENCH	LBE
	LANDSCAPE, BOLLARD	LB
	LANDSCAPE, BOULDER	LBR
	LANDSCAPE, BUSH	LBU
	LANDSCAPE, FLAGPOLE	LFP
	LANDSCAPE, GROUND LIGHT	LGL
	LANDSCAPE, MAILBOX	LMB
	LANDSCAPE, MISCELLANEOUS POINT	LMP
	LANDSCAPE, TREE, CONIFEROUS	LTC
	LANDSCAPE, TREE, DECIDUOUS	LTD
MB	MONUMENT, BENCHMARK	MB
	MONUMENT, CONTROL	MC
	MONUMENT, FOUND	MF
	MONUMENT, FOUND, OFFSET	MFO
	MONUMENT, SET	MS
	MONUMENT, RIGHT-OF-WAY	MROW
	MONUMENT, SECTION CORNER	MSC
	MONUMENT, SECTION CORNER, CALCULATED	MSCC
	MONUMENT, SECTION CORNER, REFERENCE	MSCR
	MONUMENT, SECTION CORNER, TIE	MSCT
	MONUMENT, SECTION CORNER, WITNESS	MSCW
	RAILROAD, CROSSBUCK	RRCB
	RAILROAD, SIGN, CROSSING	RRSC
	SIGNS, BILLBOARD	SBLB
	SIGNS, DELINEATOR	SD
	SIGNS, INFORMATION	SI
	SIGNS, MONUMENT	SM
	SIGNS, REGULATORY	SR
	STRIPING, ARROW, LEFT	STAL
	STRIPING, ARROW, RIGHT	STAR
	STRIPING, ARROW, STRAIGHT	STAS
	STRIPING, BICYCLE	STBC
	STRIPING, HANDICAP	STHC
	STRIPING, ONLY	STO
	TRAFFIC CONTROL, CABINET	TCC
	TRAFFIC CONTROL, PEDESTRIAN CROSSING	TCPC
	TRAFFIC CONTROL, POLE WITH MAST	TCPM
	TRAFFIC CONTROL, PULLBOX	TCPB
	UTILITY, CABLE, PEDESTAL	UCP
	UTILITY, CABLE, PULLBOX	UCPB
	UTILITY, CABLE, WARNING SIGN	UCWS
	UTILITY, ELECTRIC, MANHOLE	UEMH
	UTILITY, ELECTRIC, METER	UEM
	UTILITY, ELECTRIC, POLE	UEP
	UTILITY, ELECTRIC, PULLBOX	UEPB
	UTILITY, ELECTRIC, TRANSFORMER	UET
	UTILITY, ELECTRIC, VAULT	UEV
	UTILITY, ELECTRIC, WARNING SIGN	UEWS
	UTILITY, FIBER OPTIC, PEDESTAL	UFP
	UTILITY, FIBER OPTIC, PULLBOX	UFPB
EV	UTILITY, FIBER OPTIC, VAULT	UFV
	UTILITY, FIBER OPTIC, WARNING SIGN	UFWS
	UTILITY, GAS, MANHOLE	UGMH
	UTILITY, GAS, METER	UGM
EV	UTILITY, GAS, VALVE	UGV
	UTILITY, GAS, WARNING SIGN	UGWS
	UTILITY, IRRIGATION, CONTROL VALVE	UICV
	UTILITY, IRRIGATION, SPRINKLER HEAD	UISH
	UTILITY, POLE, H-STRUCTURE	UPH
	UTILITY, POLE, PEDESTRIAN LIGHT	UPPL
	UTILITY, POLE, STEEL	UPS
	UTILITY, POLE, STREET LIGHT	UPSL
	UTILITY, POLE, WOOD	UPW
	UTILITY, POLE, WOOD WITH LIGHT	UPWL
	UTILITY, SEWER, CLEANOUT	USCO
	UTILITY, SEWER, MANHOLE	USMH
	UTILITY, SEWER, WARNING SIGN	USWS
	UTILITY, TELEPHONE, MANHOLE	UTMH
	UTILITY, TELEPHONE, POLE	UTP
	UTILITY, TELEPHONE, PULLBOX	UTPB
	UTILITY, TELEPHONE, WARNING SIGN	UTWS
	UTILITY, UNIDENTIFIED, MANHOLE	UUMH
	UTILTIY, UNIDENTIFIED, PEDESTAL	UUP
	UTILITY, UNIDENTIFIED, PULLBOX	UUPB
	UTILITY, WATER, CURB STOP	UWCS
	UTILITY, WATER, FIRE HYDRANT	UWFH
	UTILITY, WATER, MANHOLE	UWMH
	UTILITY, WATER, METER	UWM
	UTILITY, WATER, POST INDICATOR VALVE	UWPIV
	UTILITY, WATER, VALVE	UWV
	UTILITY, WATER, WARNING SIGN	UWWS
	UTILITY, WATER, YARD HYDRANT	UWYH

REMOVALS

- BUILDING TO BE REMOVED
- SIDEWALK TO BE REMOVED
- REMOVAL UTILITY
- REMOVE OBJECT

EROSION & SEDIMENT CONTROL (EC) LEGEND

- SILT FENCE
- WATTLE
- VEHICLE TRACKING CONTROL
- TEMPORARY SEEDING
- STRAW HAY BALE
- SLOPE PROTECTION
- PERMANENT SEEDING
- INLET PROTECTION
- CONCRETE WASHOUT PIT
- CHECK DAM
- CONSTRUCTION ROAD STABILIZATION
- CURB SOCK INLET PROTECTION
- DIVERSION DITCH AND DIKE, TEMPORARY
- DIVERSION CHANNEL, TEMPORARY
- EROSION CONTROL BLANKET
- MULCHING
- RIPRAP
- SEDIMENT BASIN
- SEDIMENT CONTROL LOG
- SURFACE ROUGHENING
- STABILIZED STAGING AREA
- TERRACING
- TEMPORARY STREAM CROSSING
- (COMPACTED) EARTH BERM

GRADING

- PROPOSED CONTOUR
- FUTURE CONTOUR
- EXISTING CONTOUR
- PROPOSED SWALE
- GRADE BREAK
- WETLANDS AREA NOT TO BE DISTURBED
- SPOT ELEVATION
- SPOT ELEVATION WITH DESCRIPTION SEE ABBREVIATIONS THIS SHEET

UTILITIES

- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- PROPOSED SANITARY SEWER SERVICE
- PROPOSED SLOTTED UNDER DRAIN
- PROPOSED UNDERGROUND POWER
- PROPOSED WATER LINE
- PROPOSED GAS
- PROPOSED TELEPHONE
- PROPOSED AIR TAP
- PROPOSED WATER SERVICE
- PROPOSED MANHOLE
- PROPOSED F.E.S.
- PROPOSED F.E.S. WITH ROCK APRON
- PROPOSED CURB INLET
- PROPOSED AREA INLET
- PROPOSED PIPE PLUG
- PROPOSED CLEANOUT
- PROPOSED VALVE
- PROPOSED FIRE HYDRANT ASSEMBLY
- PROPOSED REDUCER
- PROPOSED TEE WITH THRUST BLOCK
- PROPOSED BEND WITH THRUST BLOCK
- PROPOSED CROSS
- PROPOSED METER PIT AND METER VAULT

PAVING

- PROPOSED CURB AND GUTTER
- PROPOSED FLOWLINE
- PROPOSED RETAINING WALL
- PROPOSED X" CONCRETE SIDEWALK
- PROPOSED X" CONCRETE DECORATIVE
- PROPOSED ASPHALT PAVEMENT
- PROPOSED BARRICADE
- PROPOSED SIGN
- PROPOSED BUILDING
- PROPOSED FENCE
- PROPOSED PARKING STALL COUNT
- PROPOSED PAVEMENT MARKINGS
- SAWED TRANSVERSE CONTRACTION JOINT
- SAWED LONGITUDINAL JOINT
- KEYED LONGITUDINAL
- EXPANSION JOINT
- PROPOSED HANDY CAP PARKING

DRAINAGE (DR) LEGEND

- DRAINAGE BASIN ID
- DRAINAGE AREA (AC)
- MINOR STORM RUNOFF COEFFICIENT
- MAJOR STORM RUNOFF COEFFICIENT
- PROPOSED DRAINAGE BASIN BOUNDARY
- PROPOSED DRAINAGE SUB BASIN BOUNDARY
- EXISTING DRAINAGE BASIN BOUNDARY
- EXISTING DRAINAGE SUB BASIN BOUNDARY
- DRAINAGE FLOW PATH
- DESIGN POINT
- CHANNEL FLOW ARROW
- OVERLAND FLOW ARROW

GENERAL ABBREVIATIONS

AC	ACRES
A.D.	GRADE CHANGE
ADA	AMERICANS WITH DISABILITIES ACT
BLDG	BUILDING
BOC	BACK OF CURB
BOSW	BACK OF WALK
BOP	BOTTOM OF PIPE
BOW	BOTTOM OF WALL AT FINISHED GRADE
CATV	CABLE TELEVISION
CF	CUBIC FOOT
CL	CENTERLINE
CMP	CORRUGATED METAL PIPE
CP	CONTROL POINT
CY	CUBIC YARD
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
E	EAST
EOA	EDGE OF ASPHALT
EOB	EDGE OF BOX
ELEV.	ELEVATION
EOG	EDGE OF GRAVEL
FES	FLARED END SECTION
FFE	FINISH FLOOR ELEVATION
FH	FIRE HYDRANT
FL	FLOWLINE
G	GAS
G.B.	GRADE BREAK
HP	HIGH POINT
HORIZ	HORIZONTAL
I.E.	INVERT ELEVATION
L	LEGAL DIMENSIONS
LF	LINEAR FEET
LP	LOW POINT
M	MEASURED
MH	MANHOLE
ME	MATCH EXISTING
MOE	MINIMUM OPENING ELEVATION
N	NORTH
N.T.S.	NOT TO SCALE
P	PLAT DIMENSIONS
PC	POINT OF CURVATURE
PI	POINT OF INTERSECTION
PL	PROPERTY LINE
PT	POINT OF TANGENCY
PVC	POLYVINYL CHLORIDE
P.V.C.	POINT OF VERTICAL CURVE
PVI	POINT OF VERTICAL INTERSECTION
PVT	POINT OF VERTICAL TANGENCY
R	RECORD DIMENSIONS
RAD	RADIUS
RB	REBAR
RCP	REINFORCED CONCRETE PIPE
ROW	RIGHT OF WAY
S	SOUTH
SF	SQUARE FEET
SS	SANITARY SEWER
ST	STORM
STA	STATION
STD	STANDARD
T	TELEPHONE
TOC	TOP OF CURB
TOF	TOP OF FOUNDATION
TOG	TOP OF GRADE
TOI	TOP OF ISLAND
TOP	TOP OF PAVEMENT
TOW	TOP OF WALL
TYP.	TYPICAL
VERT	VERTICAL
W/	WITH
W	WEST
WQCV	WATER QUALITY CAPTURE VOLUME

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STERLING RANCH LIFT STATION AND FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

FORCE MAIN LEGEND

LAMP RYNEARSON - ENGINEERS

BRADLEY A. SIMONS
34705

SHEET
G0.3

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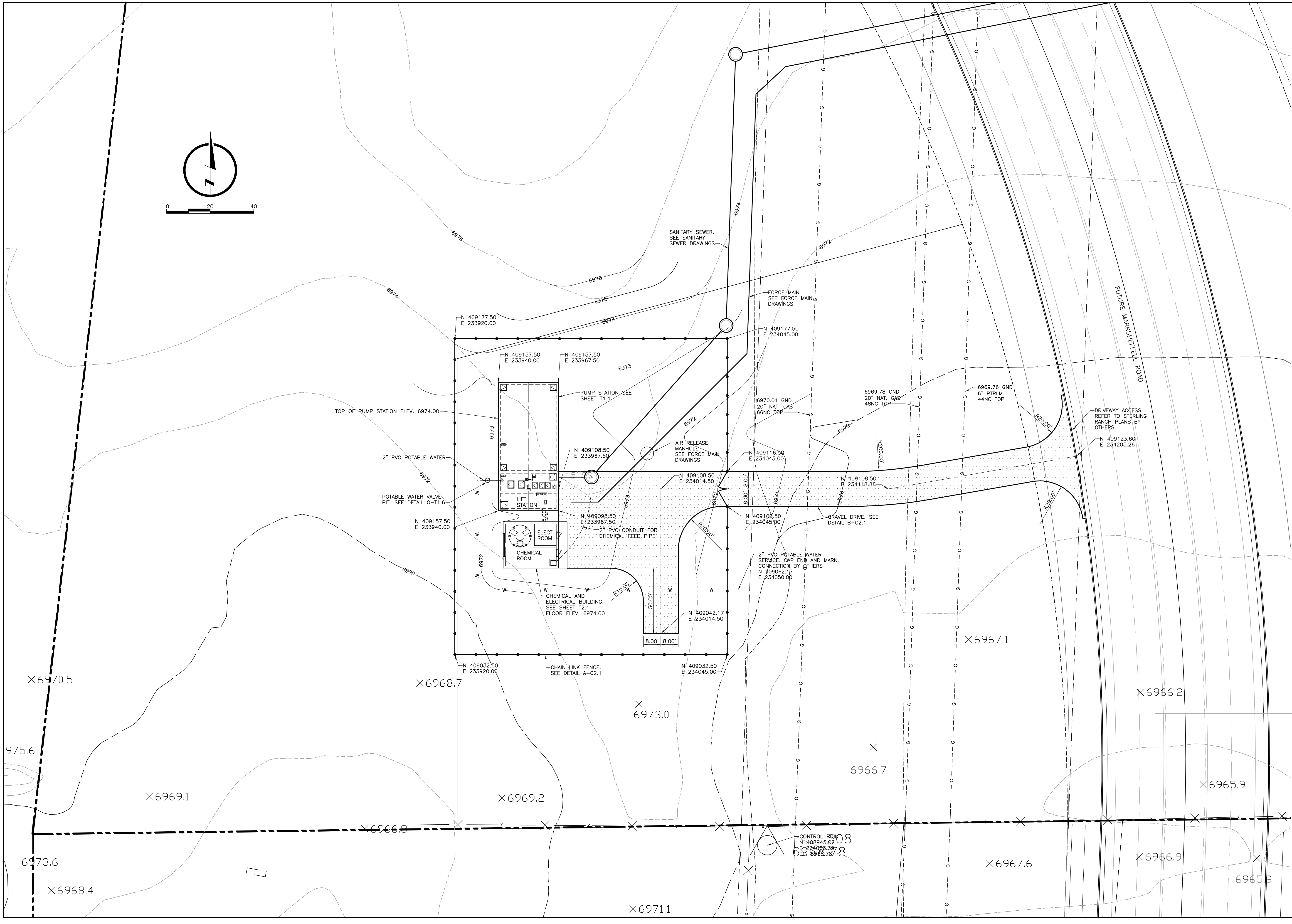
P:_Engineering\0416011 Sterling Ranch Lift Station\DRAWINGS\CONSTRUCTION DRAWINGS\0416011-CRV.dwg, 4/21/2017 2:32:18 PM, JASON MCNEILL LAMP RYNEARSON & ASSOCIATES



0
20
40
6976
6974
6976
6975
6974
6974
6972
SANITARY SEWER.
SEE SANITARY
SEWER DRAWINGS
FORCE MAIN
SEE FORCE MAIN
DRAWINGS
N 409177.50
E 233920.00
N 409177.50
E 234045.00
N 409157.50
E 233940.00
N 409157.50
E 233967.50
6973
PUMP STATION SEE
SHEET T1.1
TOP OF PUMP STATION ELEV. 6974.00
6973
2" PVC POTABLE WATER
6972
POTABLE WATER VALVE
PIT. SEE DETAIL G-T1.6
N 409157.50
E 233940.00
LIFT
STATION
N 409108.50
E 233967.50
AIR RELEASE
MANHOLE
SEE FORCE MAIN
DRAWINGS
N 409108.50
E 234014.50
N 409116.50
E 234045.00
N 409098.50
E 233967.50
2" PVC CONDUIT FOR
CHEMICAL FEED PIPE
ELECT.
ROOM
CHEMICAL
ROOM
5.00'
6972
6970
R15.00'
R20.00'
30.00'
8.00'
8.00'
8.00'
8.00'
CHEMICAL AND
ELECTRICAL BUILDING.
SEE SHEET T2.1
FLOOR ELEV. 6974.00
N 409042.17
E 234014.50
N 409100.50
E 234045.00
GRAVEL DRIVE. SEE
DETAIL B-C2.1
2" PVC POTABLE WATER
SERVICE. CAP END AND MARK.
CONNECTION BY OTHERS
N 409062.17
E 234050.00
6970.01 GND
20" NAT. GAS
66NC TOP
6969.78 GND
20" NAT. GAS
48NC TOP
6969.76 GND
6" PTRLM.
44NC TOP
6970
6971
6970
R200.00'
N 409108.50
E 234118.88
R20.00'
R20.00'
FUTURE MARKSHEFFELL ROAD
DRIVEWAY ACCESS.
REFER TO STERLING
RANCH PLANS BY
OTHERS
N 409123.60
E 234205.26
N 409032.50
E 233920.00
CHAIN LINK FENCE.
SEE DETAIL A-C2.1
N 409032.50
E 234045.00
×6970.5
×6968.7
×6973.0
×6967.1
×6966.2
975.6
×6969.1
×6969.2
6966.7
×6965.9
×6966.8
CONTROL POINT
N 408945.02
E 234063.39
EL 6968.78
6973.6
×6968.4
×6971.1
×6967.6
×6966.9
6965.9

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STERLING RANCH LIFT STATION & FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

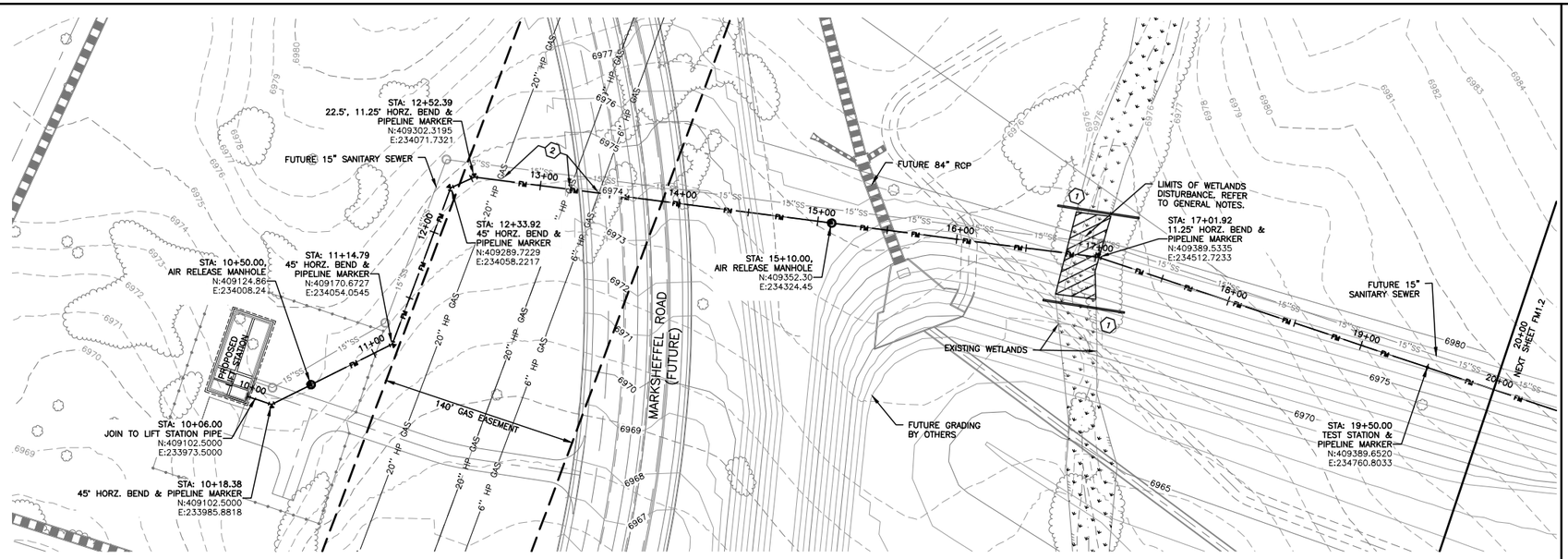
LIFT STATION SITE PLAN

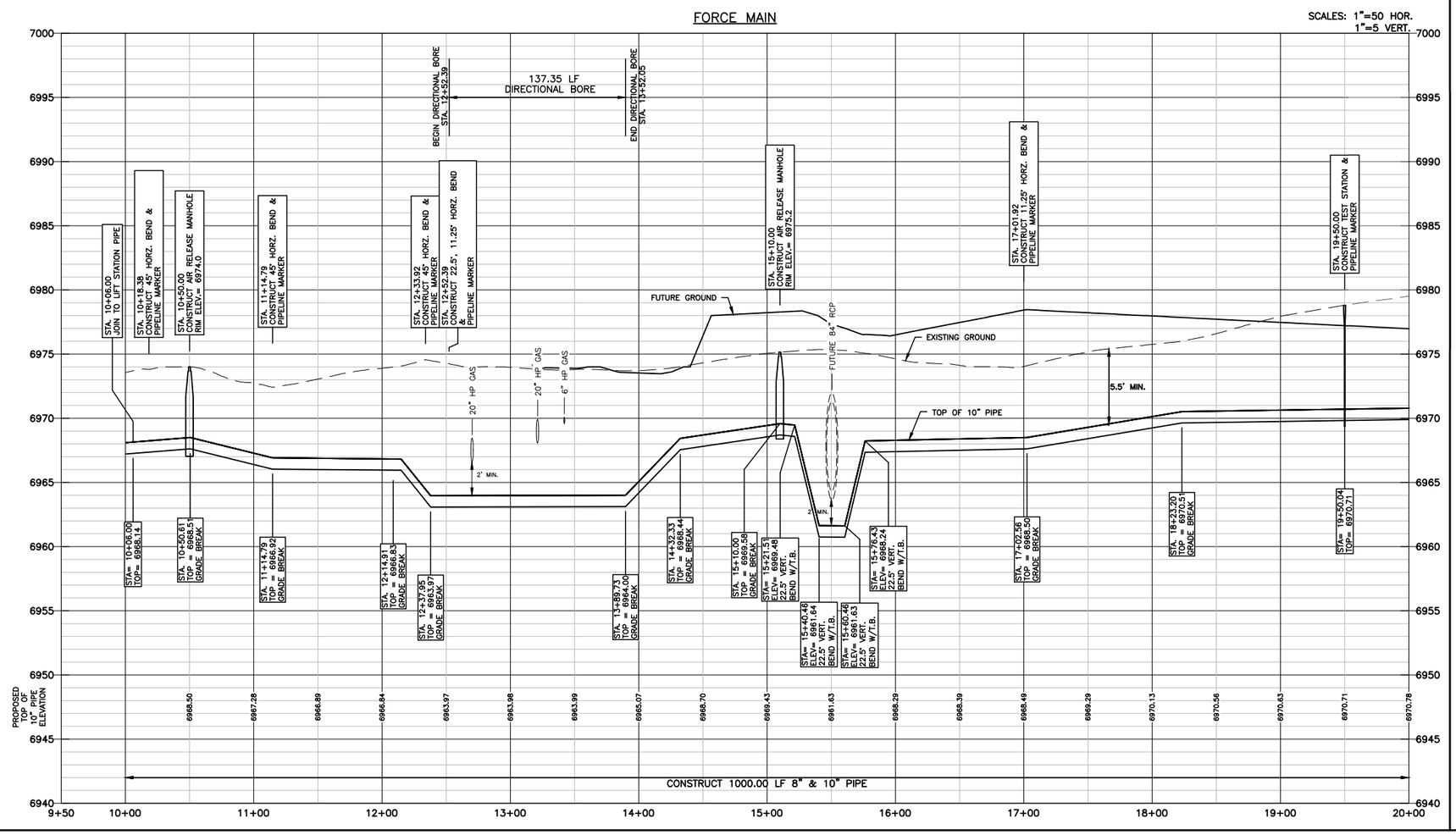
LAMP RYNEARSON - ENGINEERS

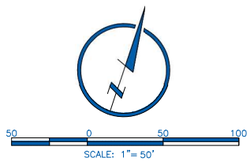
COLORADO REGISTERED PROFESSIONAL ENGINEER BRADLEY A. SIMONS 34705 4/24/17

BRADLEY A. SIMONS
34705

SHEET
C1.1







NOTES:

1. SEE SHEET G0.2 FOR GENERAL NOTES.
2. STATIONING IS BASED ON THE CENTERLINE BETWEEN THE 8" AND 10" FORCE MAINS.
3. CONTRACTOR SHALL INSTALL THRUST BLOCKS AT ALL HORIZONTAL AND VERTICAL BENDS PER DETAIL.
4. CONTRACTOR IS RESPONSIBLE FOR CONFIRMING THE HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UTILITIES WITHIN THE AREA OF WORK 7 DAYS PRIOR TO THE START OF INSTALLATION OF THE PIPELINE. THE CONTRACTOR SHALL NOTIFY OWNER AND ENGINEER OF ANY CONFLICTS THAT ARISE AND REQUIRE REDESIGN OF ANY PORTION OF THE PROJECT. REFER TO GENERAL NOTES FOR FURTHER INFORMATION.
5. CONTRACTOR SHALL BE REQUIRED TO STAY WITHIN THE CONSTRUCTION EASEMENTS AND/OR ROAD RIGHT OF WAY WHEN CONSTRUCTING THE PIPELINE. TRAFFIC CONTROL MEASURES SHALL BE IN PLACE DURING CONSTRUCTION PER EL PASO COUNTY REQUIREMENTS.
6. CONTRACTOR SHALL PROVIDE A MINIMUM 1' OF CLEARANCE BETWEEN ALL UTILITIES UNLESS OTHERWISE NOTED.
7. CONTRACTOR SHALL PLACE SEDIMENT CONTROL LOGS UPSTREAM OF ALL STORM DRAIN PIPES WITHIN THE PROJECT AREA.
8. CONTRACTOR SHALL BLADE A SMALL 6" HIGH BERM ALONG THE DOWNSTREAM SIDE OF TRENCHING OPERATIONS TO CONTROL STORM DRAINAGE FLOWS AND MINIMIZE TRANSPORTATION SEDIMENT DOWNSTREAM. SEE DETAIL SHEET FM2.4.
9. CONTRACTOR SHALL RESEED ALL AREAS DISTURBED DURING CONSTRUCTION, INCLUDING ANY SOD AND/OR LANDSCAPING.
10. CONTRACTOR SHALL PROTECT IN PLACE OR REMOVE AND REPLACE ANY SIGNS, MAILBOXES, LANDSCAPING, OR OTHER OBSTRUCTIONS DISTURBED DURING CONSTRUCTION.

KEYNOTE:

(1) SEDIMENT CONTROL LOG PER DETAIL SHEET FM2.4

(2) CONTRACTOR SHALL COORDINATE AND OBTAIN PERMITS WITH THE UTILITY COMPANIES PRIOR TO CONSTRUCTION AND CROSSING THE EXISTING HIGH PRESSURE GAS MAIN.
   A. COLORADO INTERSTATE GAS (719) 520-4816
   B. MAGELLAN MIDSTREAM GAS (918) 574-7098

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STERLING RANCH LIFT STATION AND FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

FORCE MAIN PLAN & PROFILE
STA. 10+00 TO STA. 20+00

LAMP RYNEARSON - ENGINEERS

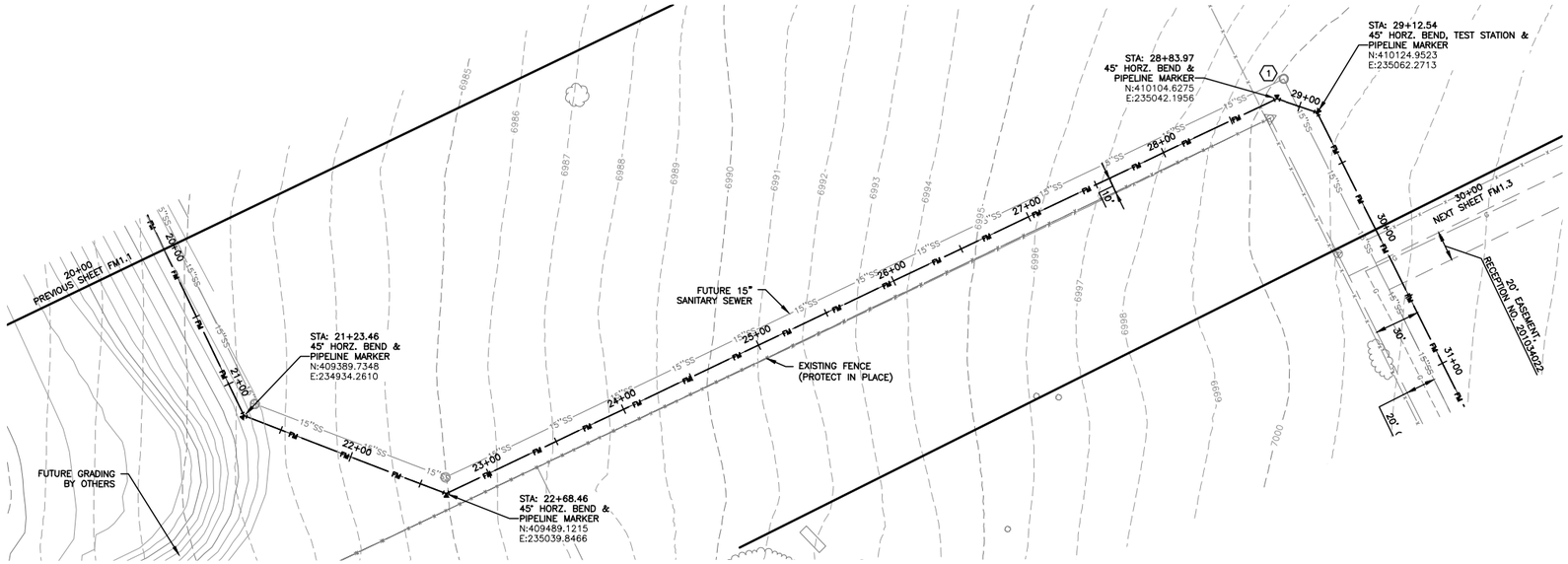
COLORADO PROFESSIONAL ENGINEER 34705 BRADLEY A. SIMONS 5/24/17

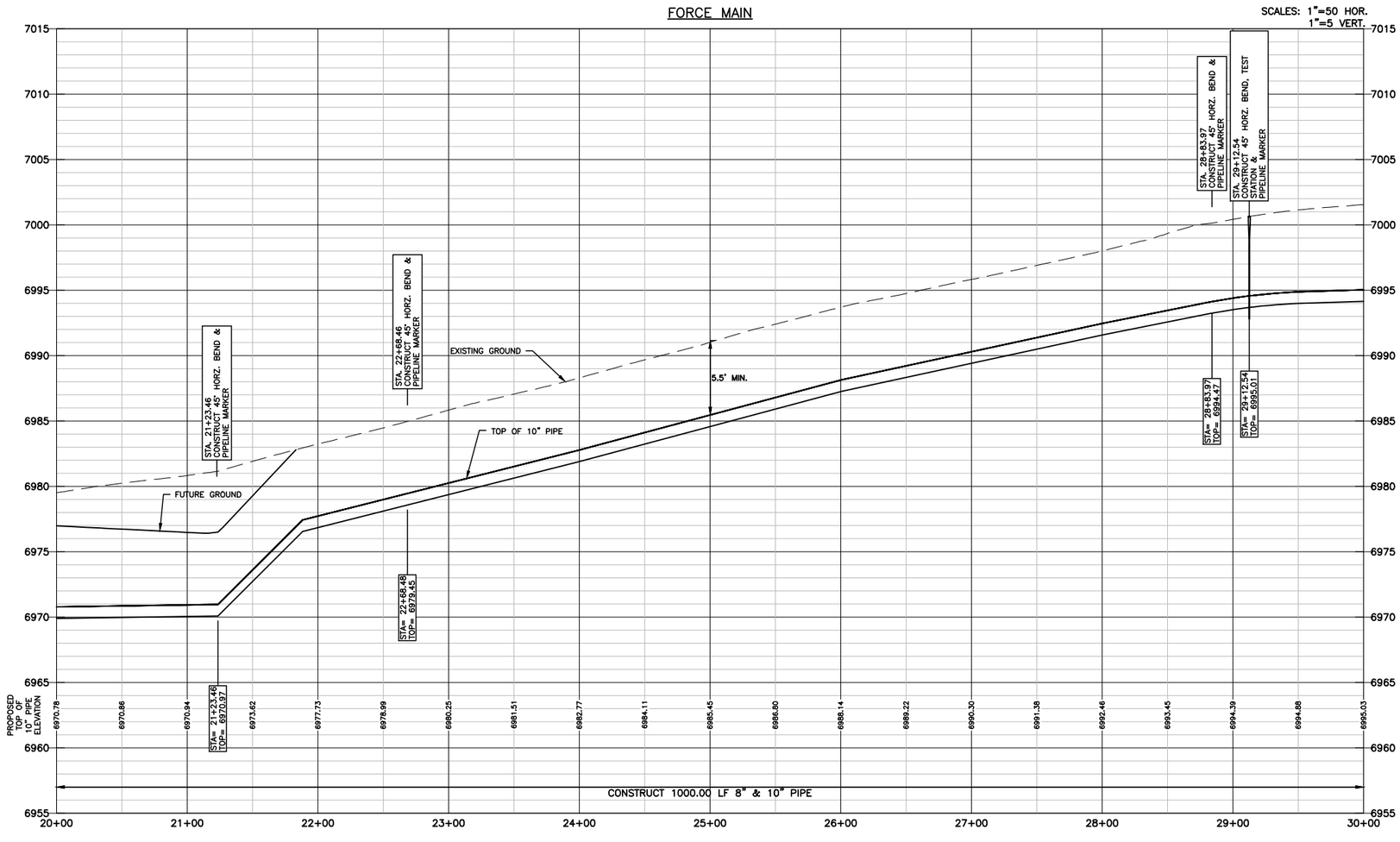
BRADLEY A. SIMONS
34705

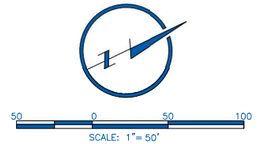
SHEET
FM1.1

COLORADO 811 KNOW WHAT'S BELOW. CALL BEFORE YOU DIG.

P:_Engineering\0416011 Sterling Ranch Lift Station\DRAWINGS\CONSTRUCTION DRAWINGS\0416011-SAN-001.dwg, 4/21/2017 2:35:57 PM, JASON MCNELL, LAMP RYNEARSON & ASSOCIATES







NOTES:

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KEYNOTE:

(1) REMOVE AND RE-INSTALL 50 LF OF EXISTING FENCE

DRAWN BY: JPM
DESIGNED BY: JPM
DATE: APRIL 24, 2017
JOB NUMBER-TASK#: 0416011
BOOK AND PAGE:

REVISIONS

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303.971.0077 | F
LRA-Inc.com / 72x4Water.com

STERLING RANCH LIFT STATION AND FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

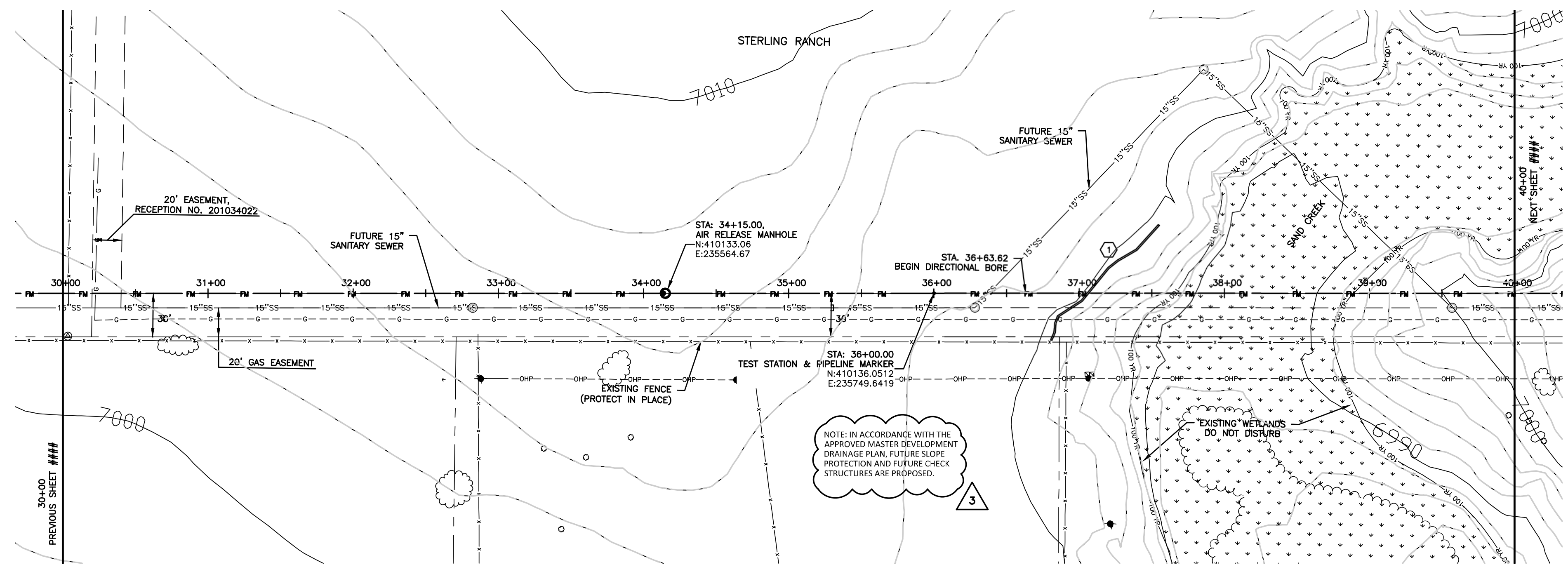
FORCE MAIN PLAN & PROFILE
STA. 20+00 TO STA. 30+00

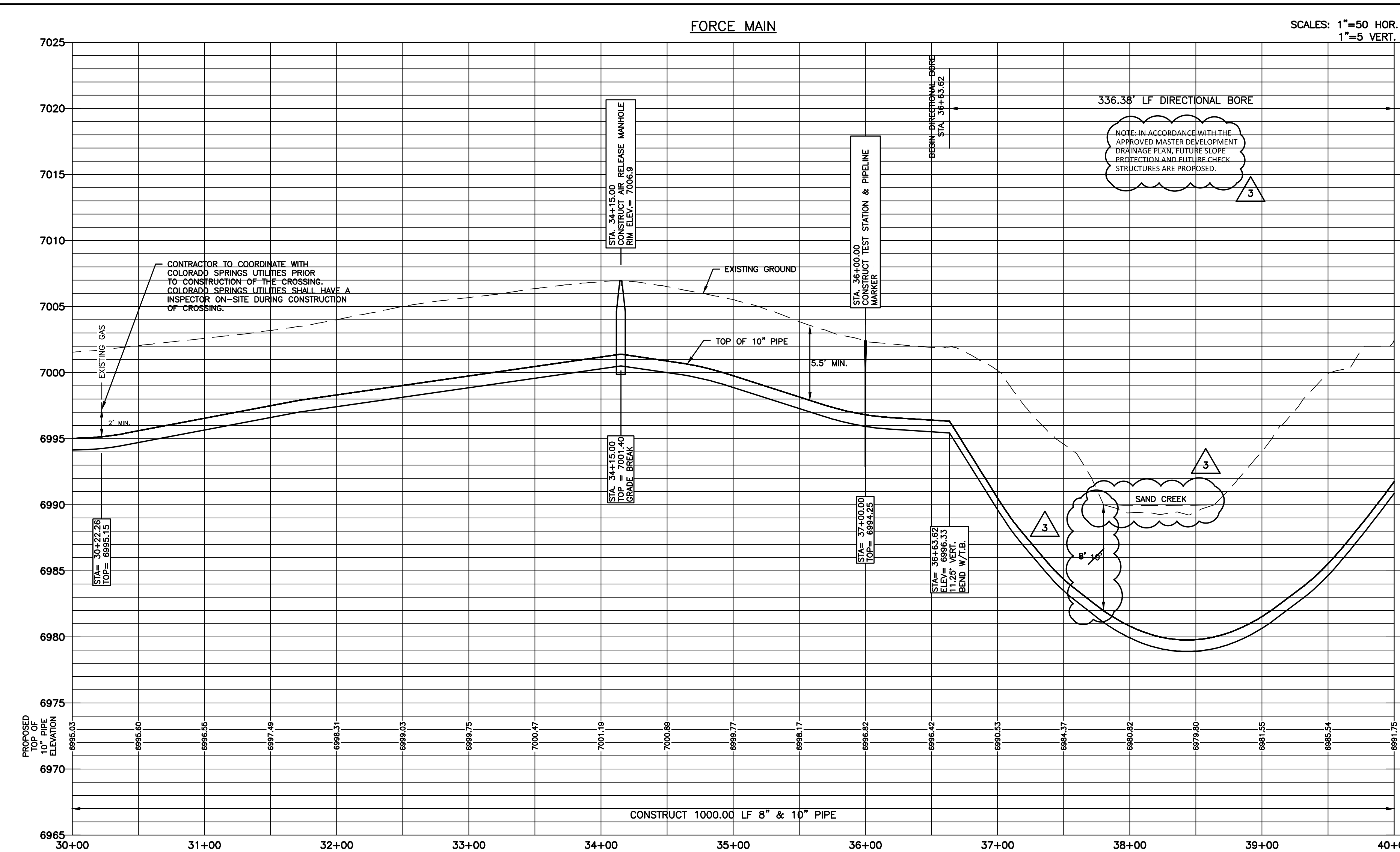
LAMP RYNEARSON - ENGINEERS

BRADLEY A. SIMONS
34705

SHEET
FM1.2

COLORADO 811 KNOW WHAT'S BELOW. CALL BEFORE YOU DIG.





SCALE: 1"= 50'

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KEYNOTE:

(1) SEDIMENT CONTROL LOG PER DETAIL SHEET FM2.4

DRAWN BY: JPM
DESIGNED BY: JPM
DATE: APRIL 24, 2017
JOB NUMBER-TASKS: 0416011
BOOK AND PAGE

REVISIONS
3 – PER EPC COMMENTS – 05/31/2019

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STERLING RANCH LIFT STATION AND FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

FORCE MAIN PLAN & PROFILE
STA. 30+00 TO STA. 40+00

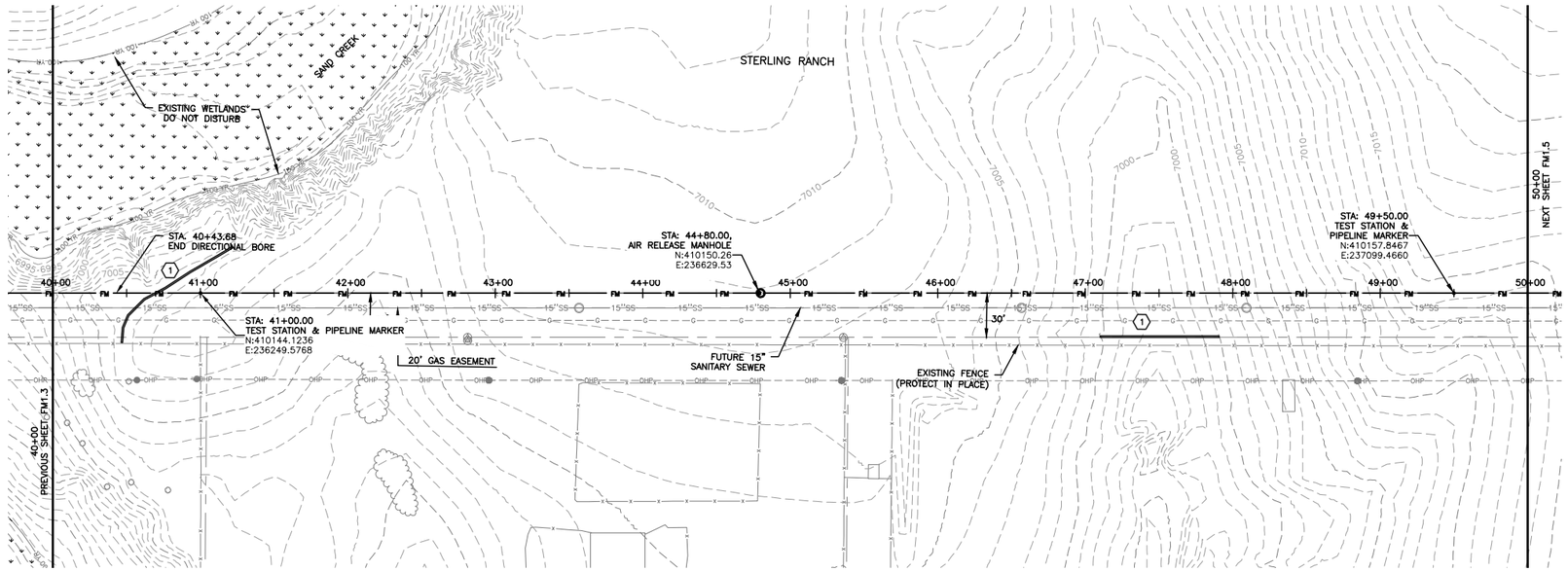
LAMP RYNEARSON - ENGINEERS

PRELIMINARY

BRADLEY A. SIMONS
34705

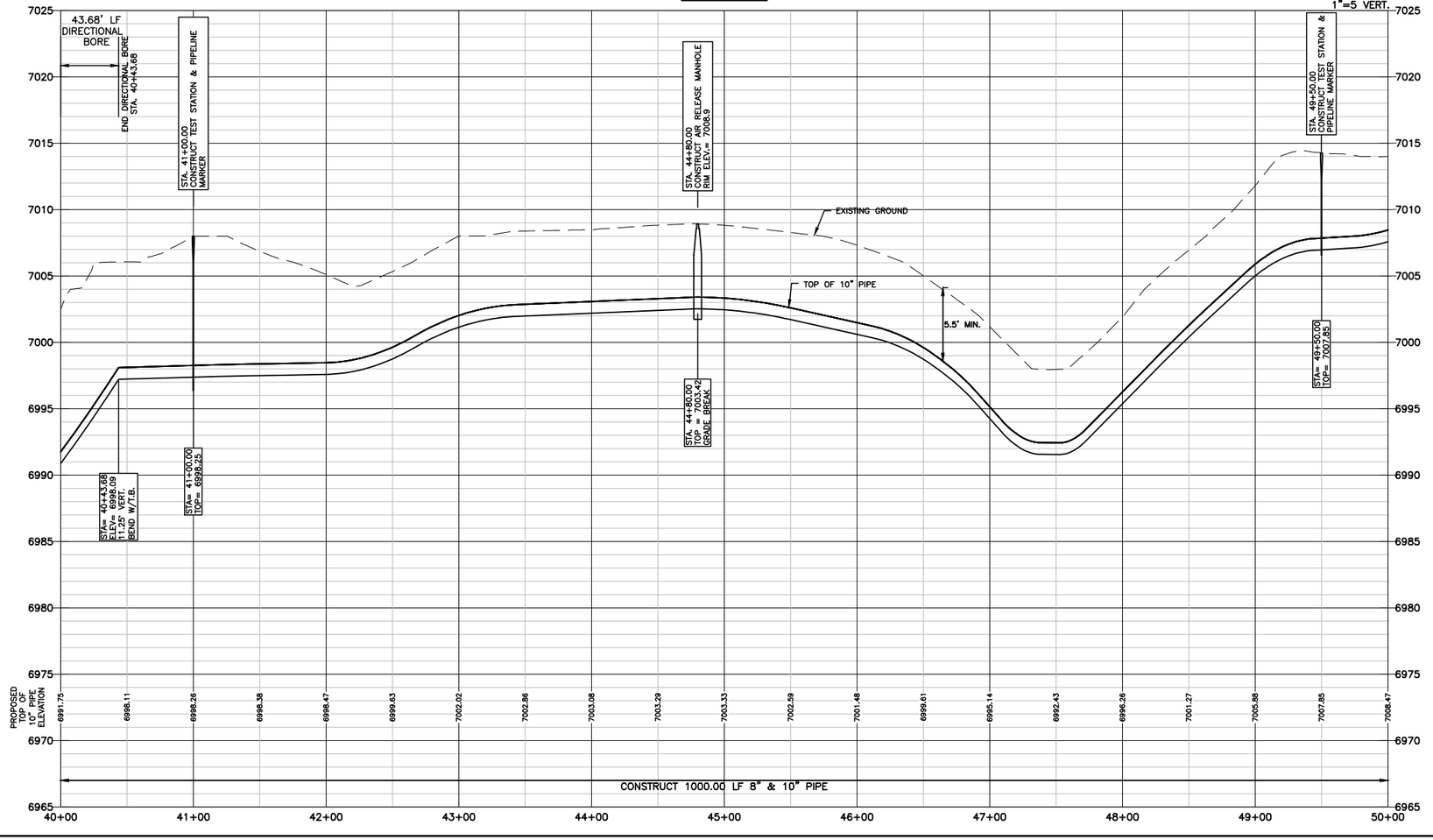
COLORADO 811 KNOW WHAT'S BELOW. CALL BEFORE YOU DIG.

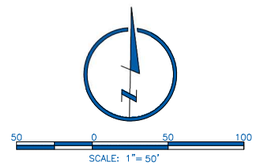
SHEET
FM1.3



FORCE MAIN

SCALES: 1"=50 HOR.
1"=5 VERT.





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DRAWN BY	JPM
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DATE	APRIL 24, 2017
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REVISIONS

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STERLING RANCH LIFT STATION AND FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

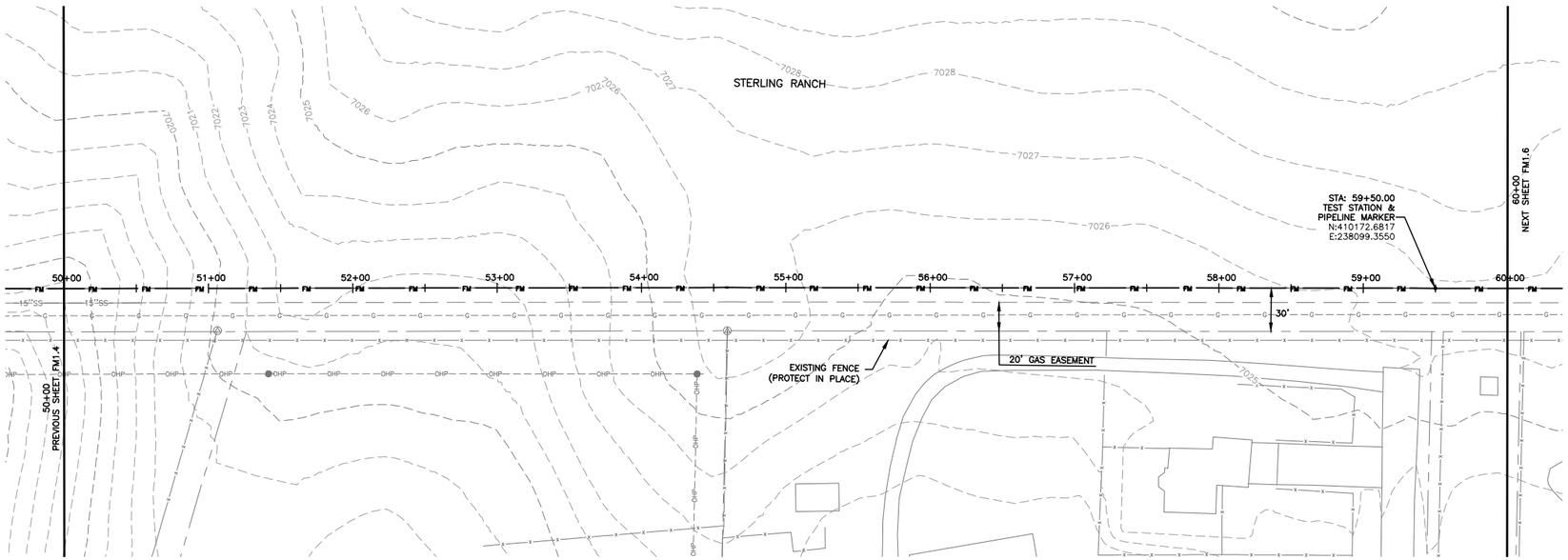
FORCE MAIN PLAN & PROFILE STA. 40+00 TO STA. 50+00

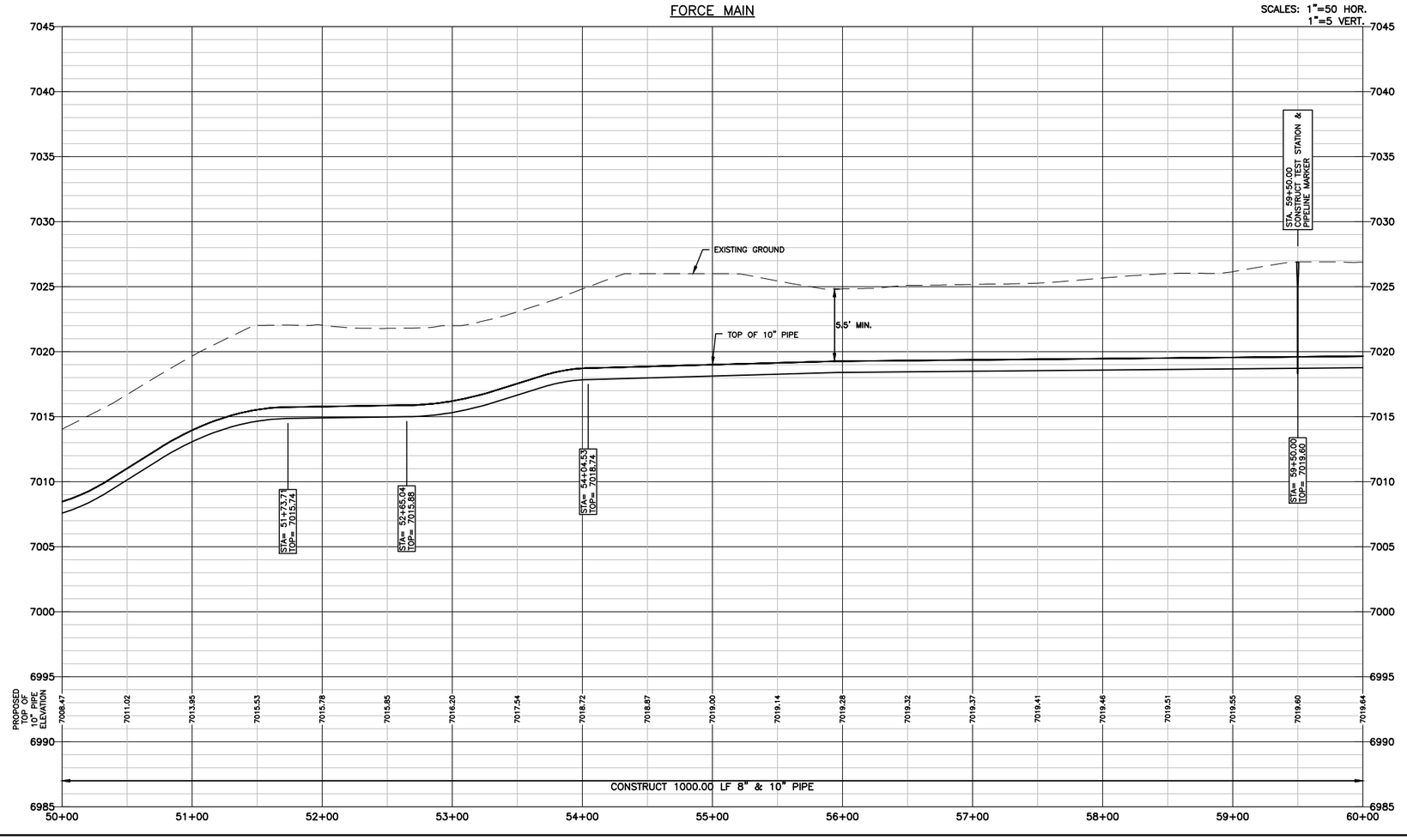
LAMP RYNEARSON - ENGINEERS

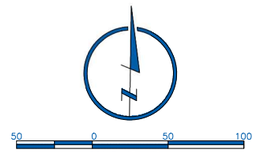
BRADLEY A. SIMONS
34705

SHEET
FM1.4

COLORADO 811 KNOW WHAT'S BELOW. CALL BEFORE YOU DIG.







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DRAWN BY: JPM
DESIGNED BY: JPM
DATE: APRIL 24, 2017
JOB NUMBER-TASK#: 0416011
BOOK AND PAGE:
REVISIONS

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303.971.0077 | F
LRA-Inc.com / 1224Water.com

STERLING RANCH LIFT STATION AND FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

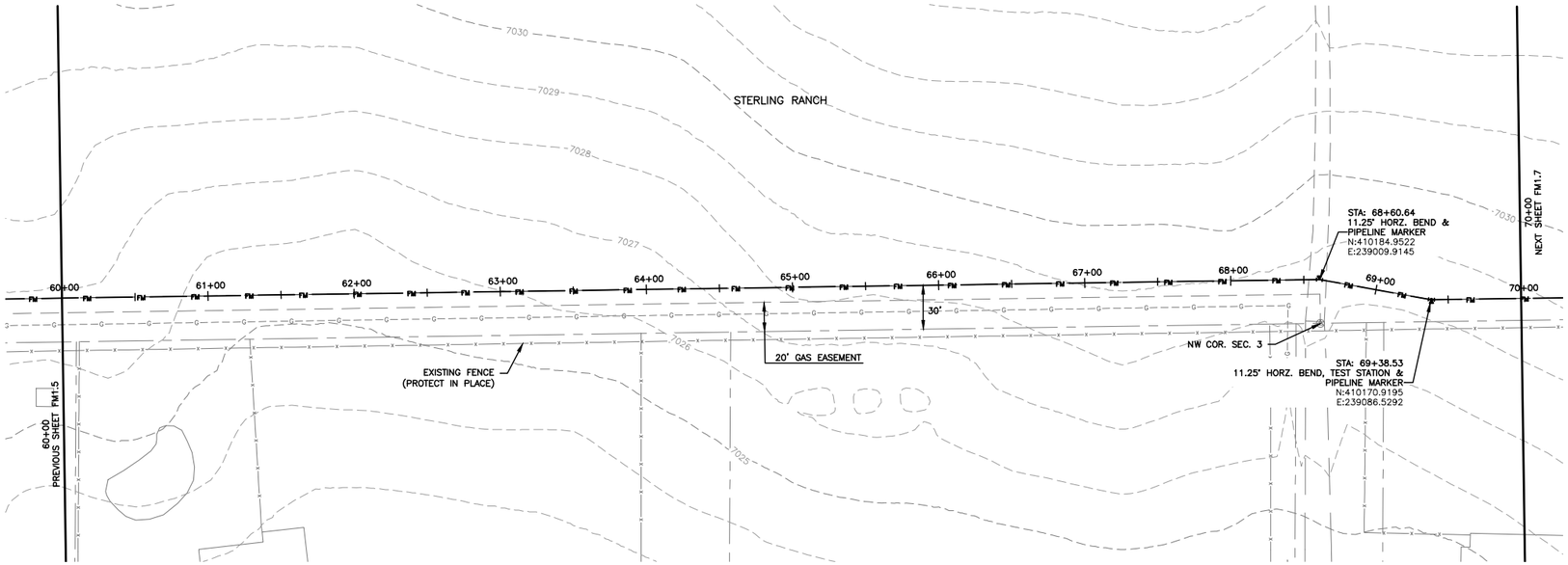
FORCE MAIN PLAN & PROFILE
STA. 50+00 TO STA. 60+00

LAMP RYNEARSON - ENGINEERS

BRADLEY A. SIMONS
34705

SHEET
FM1.5

COLORADO 811 KNOW WHAT'S BELOW. CALL BEFORE YOU DIG.



FORCE MAIN

SCALES: 1"=50 HOR.
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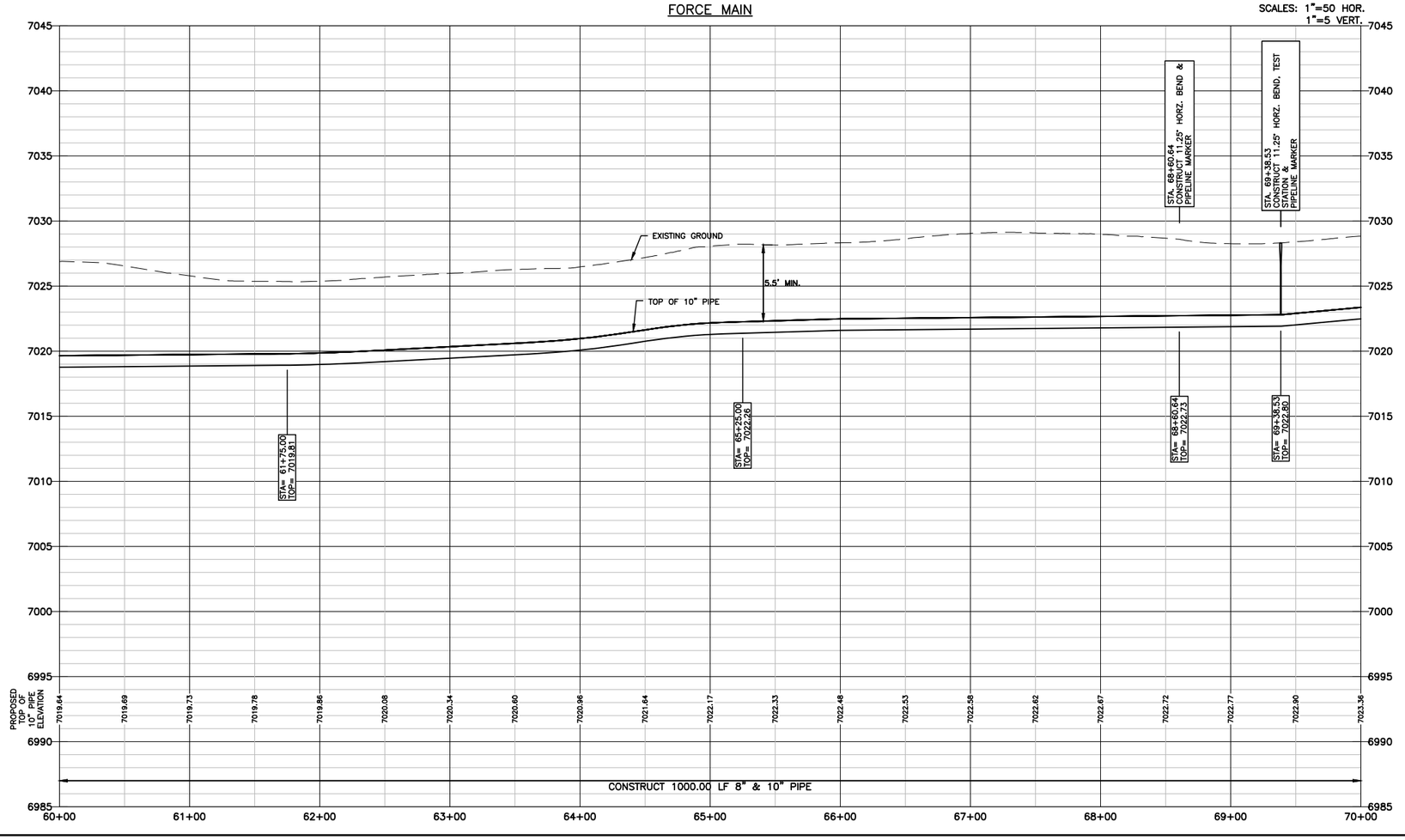

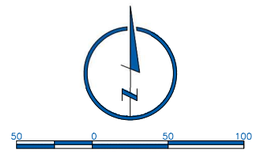

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DRAWN BY: JPM
DESIGNED BY: JPM
DATE: APRIL 24, 2017
JOB NUMBER-TASK#: 041601.1
BOOK AND PAGE:

REVISIONS

LAMP RYNEARSON & ASSOCIATES
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STERLING RANCH LIFT STATION AND FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

FORCE MAIN PLAN & PROFILE
STA. 60+00 TO STA. 70+00

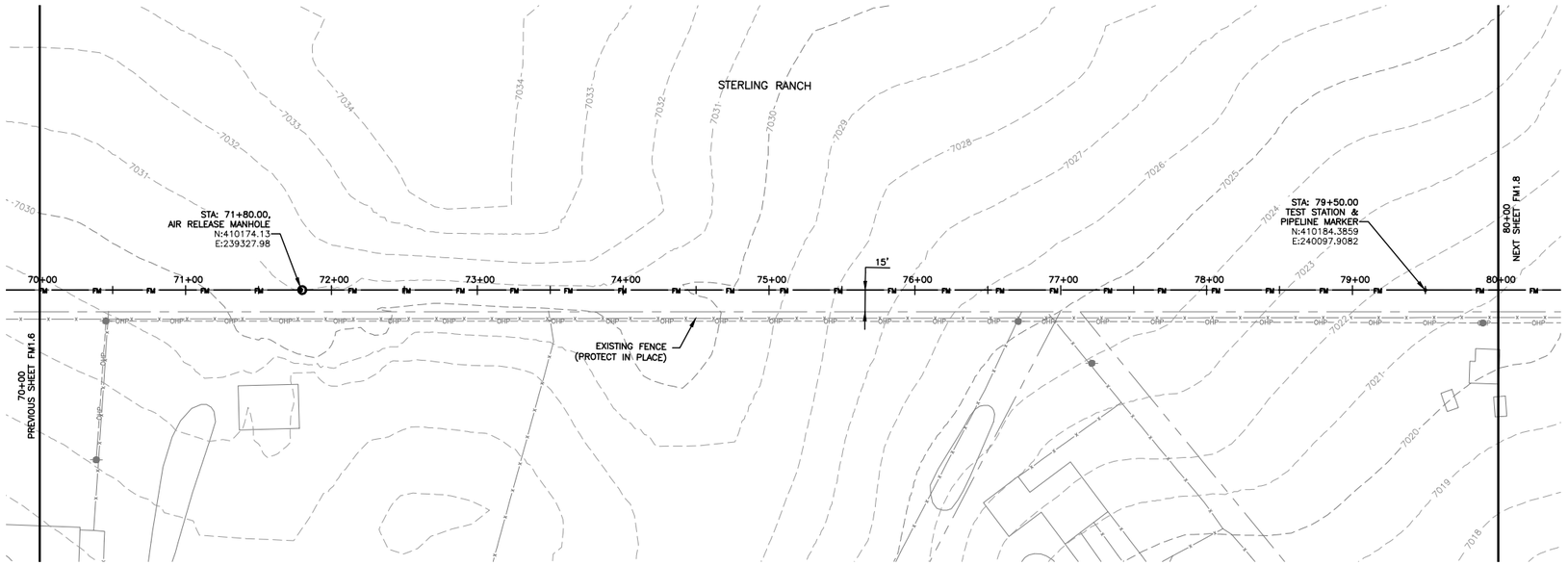
LAMP RYNEARSON - ENGINEERS

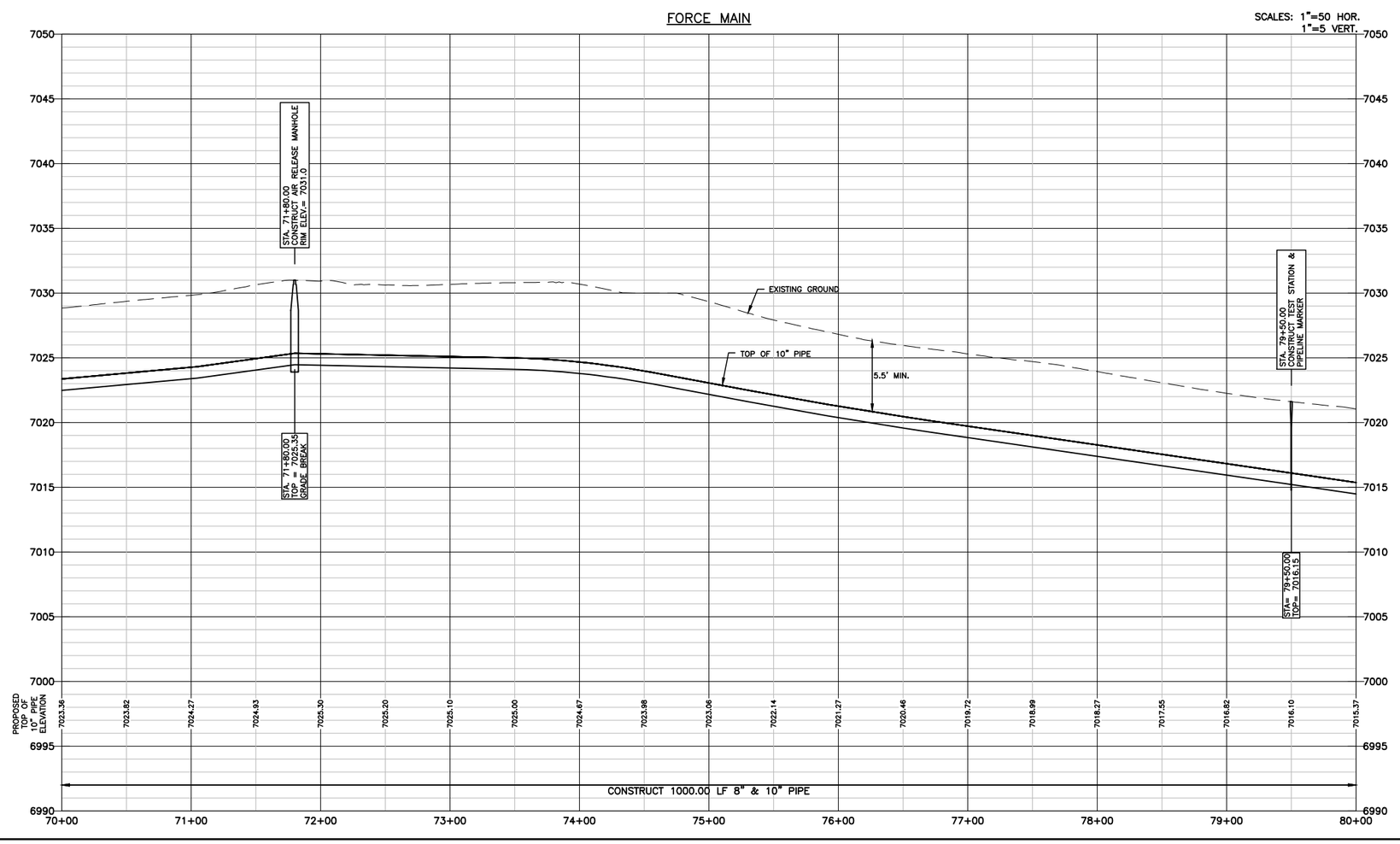
BRADLEY A. SIMONS
34705

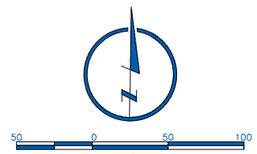
SHEET
FM1.6

COLORADO 811 KNOW WHAT'S BELOW. CALL BEFORE YOU DIG.

P:_Engineering\041601 Sterling Ranch Lift Station\DRAWINGS\CONSTRUCTION DRAWINGS\041601-SAN-001.dwg, 4/21/2017 2:30:12 PM, JASON MCNELL, LAMP RYNEARSON & ASSOCIATES







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DESIGNED BY: JPM
DATE: APRIL 24, 2017
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BOOK AND PAGE:

REVISIONS

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Lakewood, Colorado 80228 303.971.0077 | F
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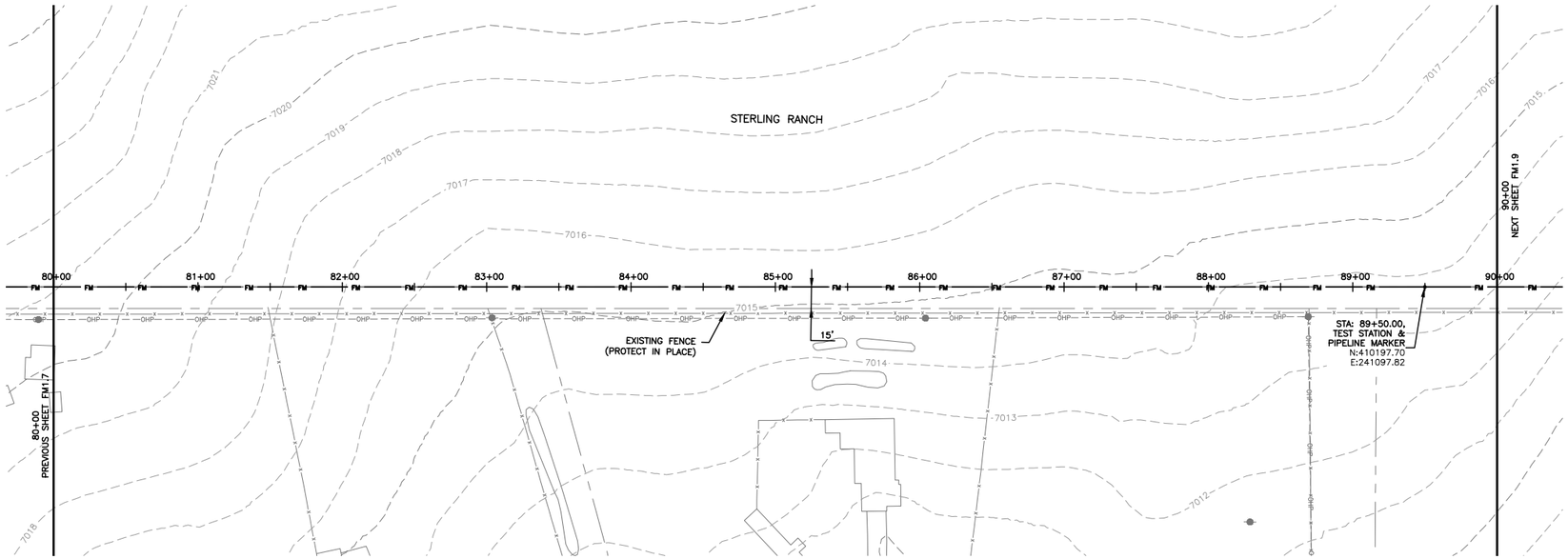
STERLING RANCH LIFT STATION AND FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

FORCE MAIN PLAN & PROFILE
STA. 70+00 TO STA. 80+00

LAMP RYNEARSON - ENGINEERS

BRADLEY A. SIMONS
34705

SHEET
FM1.7



FORCE MAIN

SCALES: 1"=50 HOR.
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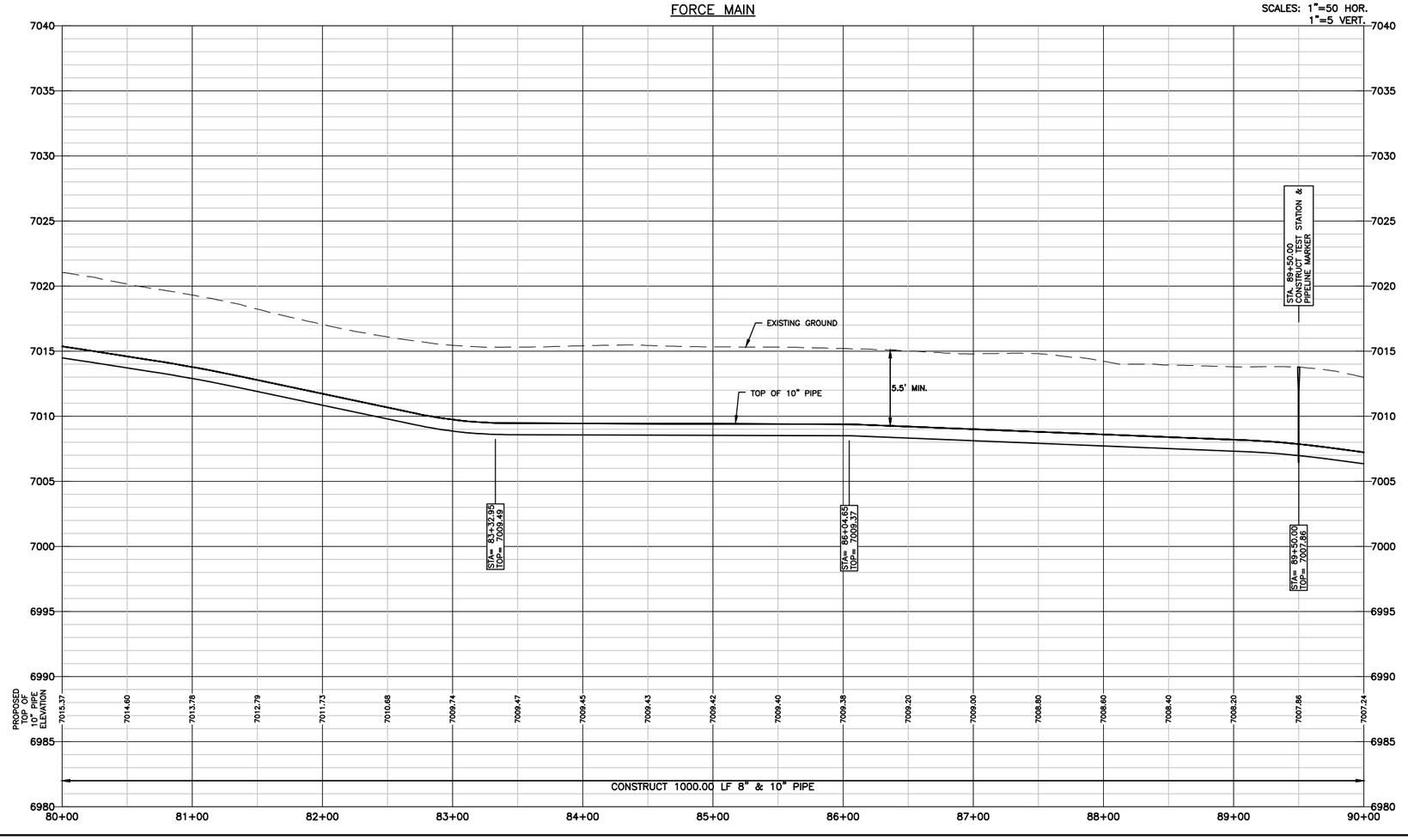

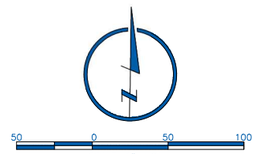

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REVISIONS

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Lakewood, Colorado 80228
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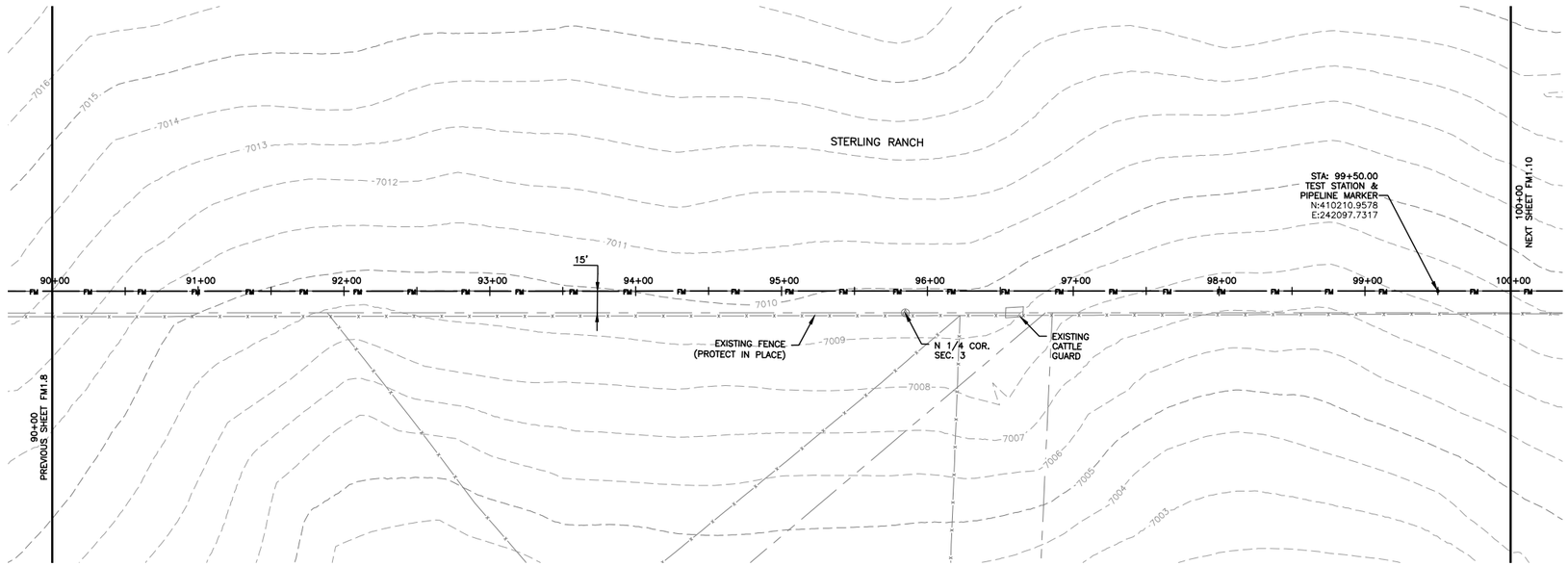
FORCE MAIN PLAN & PROFILE
STA. 80+00 TO STA. 90+00

LAMP RYNEARSON - ENGINEERS

BRADLEY A. SIMONS
34705

SHEET
FM1.8



FORCE MAIN

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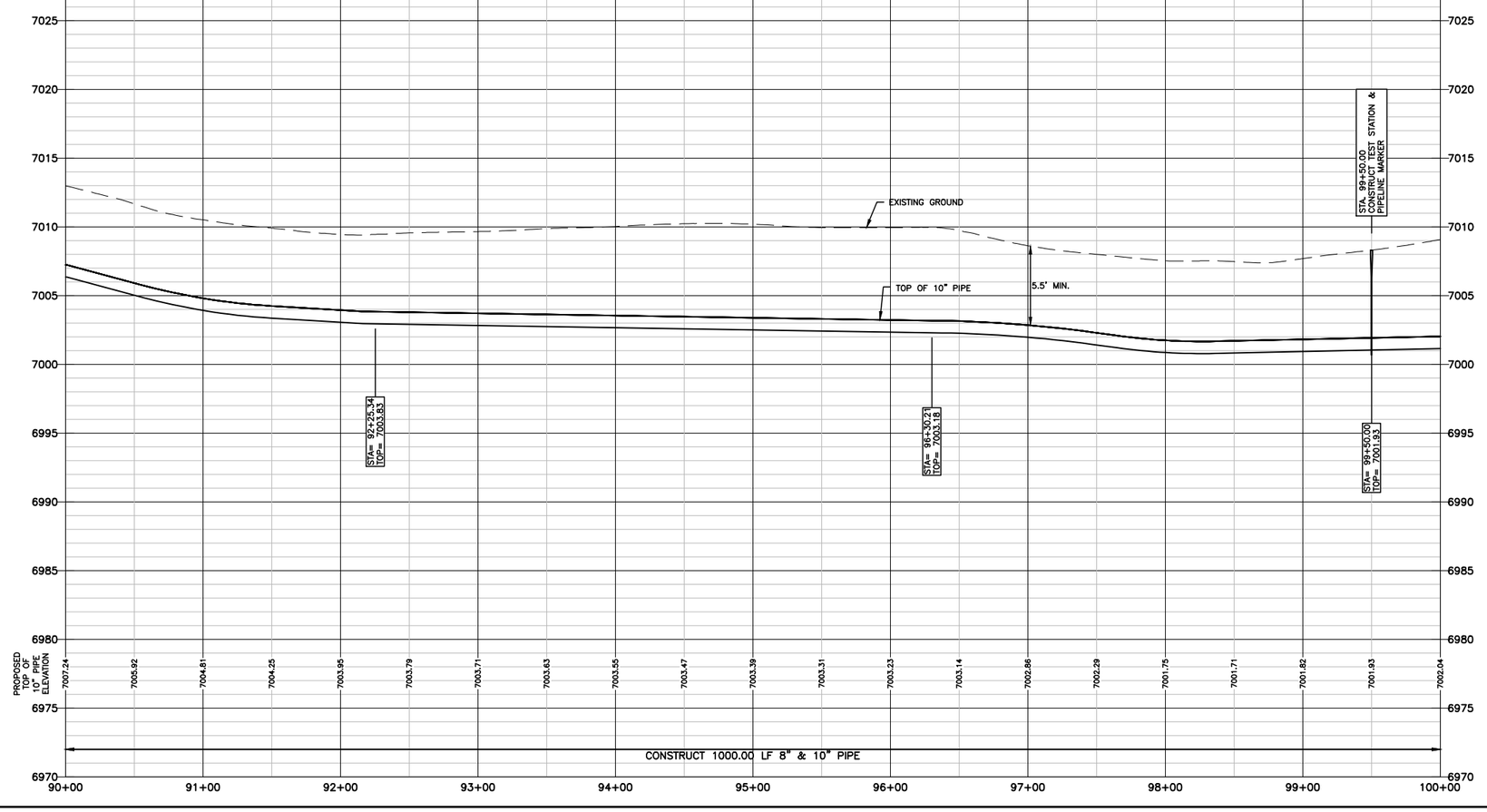

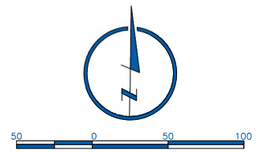

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DRAWN BY: JPM
DESIGNED BY: JPM
DATE: APRIL 24, 2017
JOB NUMBER-TASK#: 041601.1
BOOK AND PAGE:

REVISIONS

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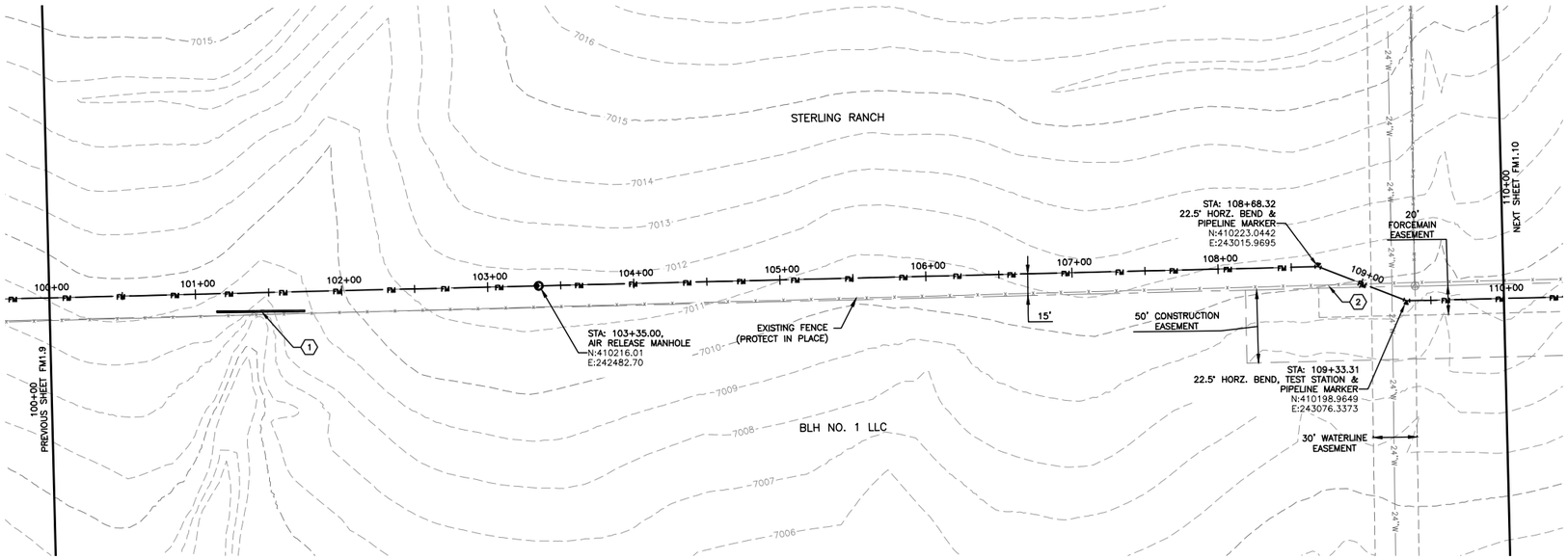
LAMP RYNEARSON - ENGINEERS

BRADLEY A. SIMONS
34705

SHEET
FM1.9

COLORADO 811 KNOW WHAT'S BELOW. CALL BEFORE YOU DIG.



FORCE MAIN

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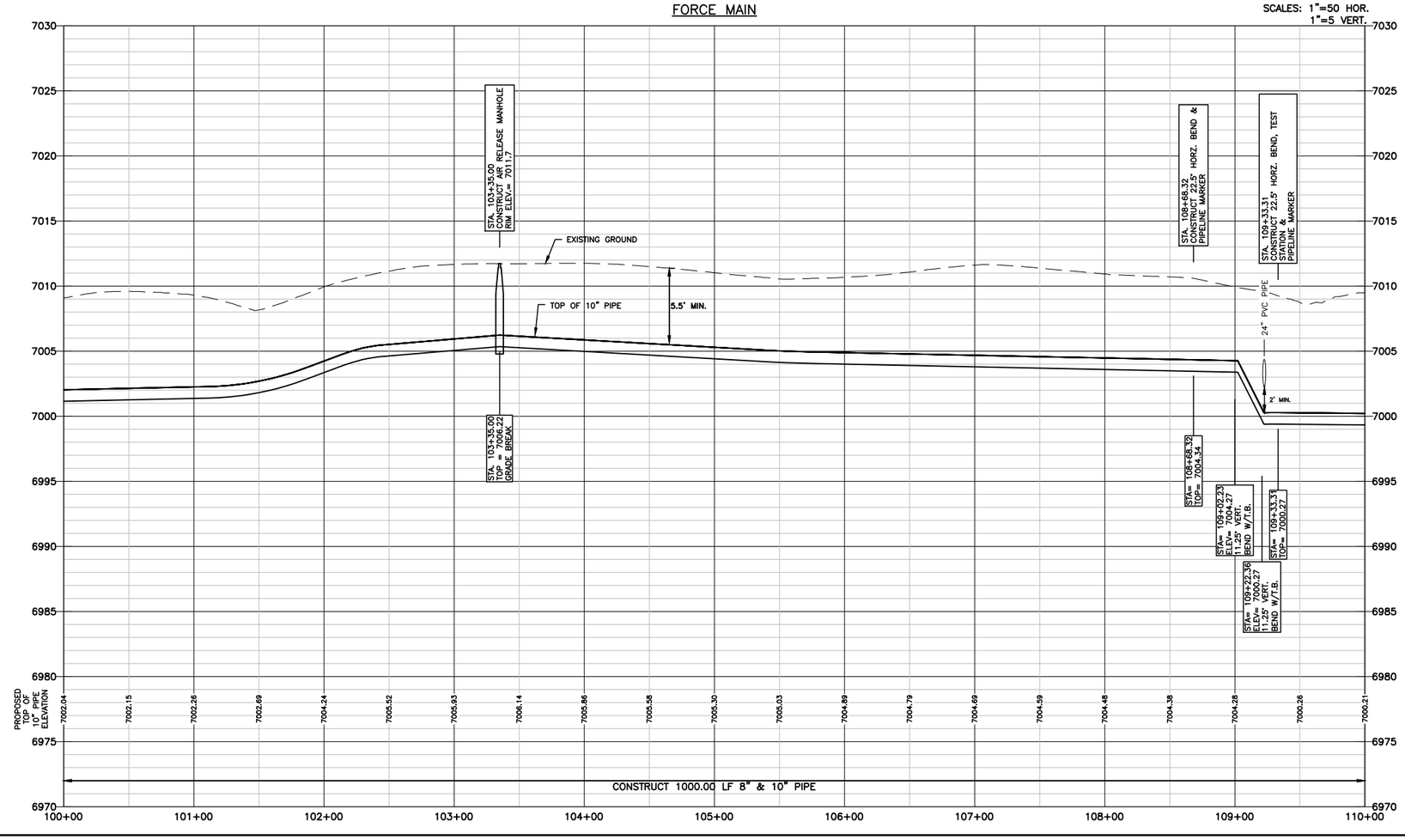

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KEYNOTE:

(1) SEDIMENT CONTROL LOG PER DETAIL SHEET FM2.4

(2) REMOVE AND RE-INSTALL 115 LF OF EXISTING FENCE

DRAWN BY	JPM
DESIGNED BY	JPM
DATE	APRIL 24, 2017
JOB NUMBER-TASK#	041601.1
BOOK AND PAGE	

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BRADLEY A. SIMONS
34705

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FM1.10

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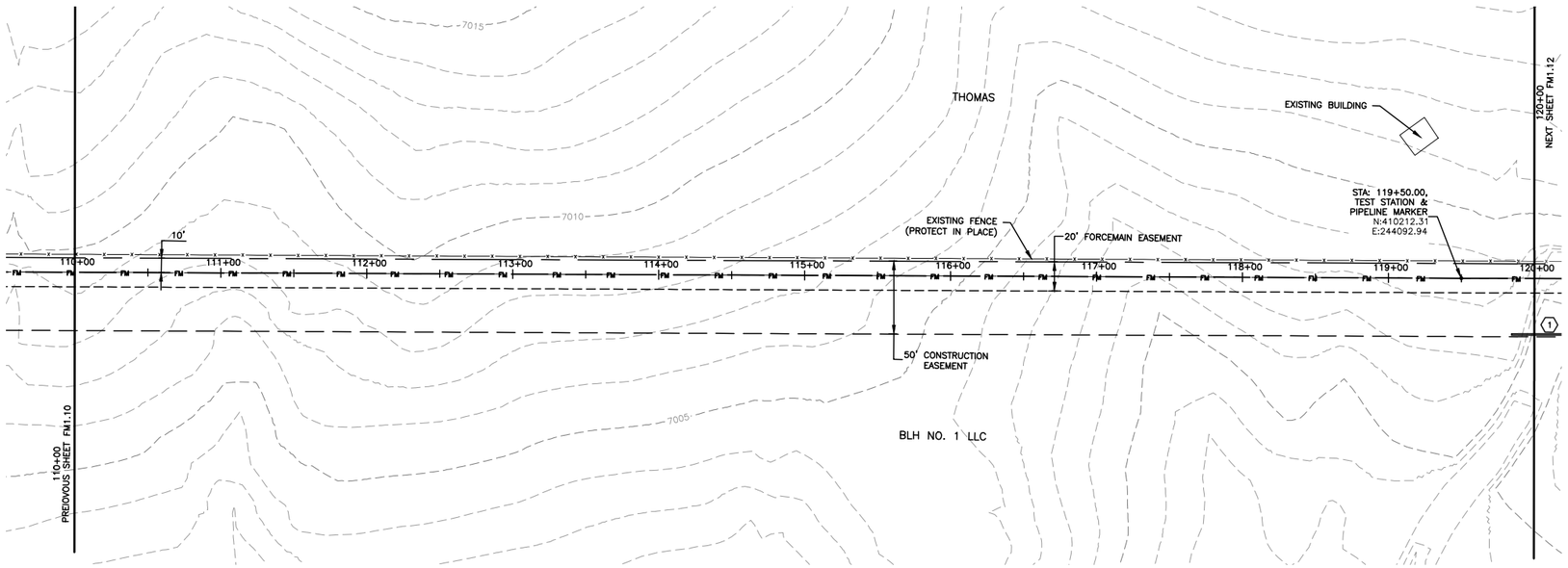

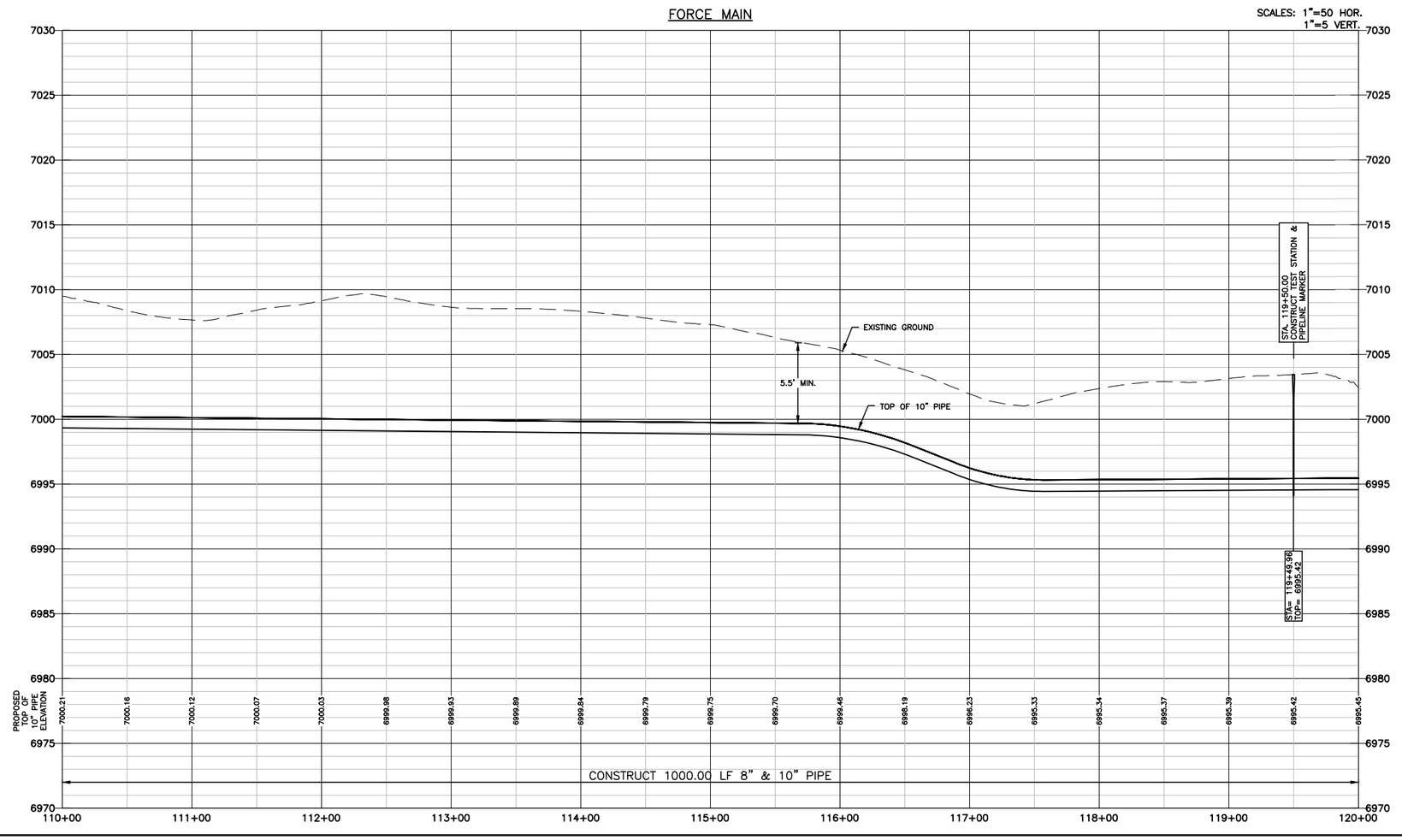

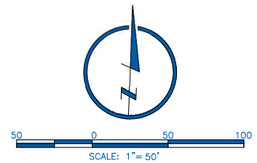

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KEYNOTES:

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DRAWN BY	JPM
DESIGNED BY	JPM
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BRADLEY A. SIMONS
34705

SHEET
FM1.11

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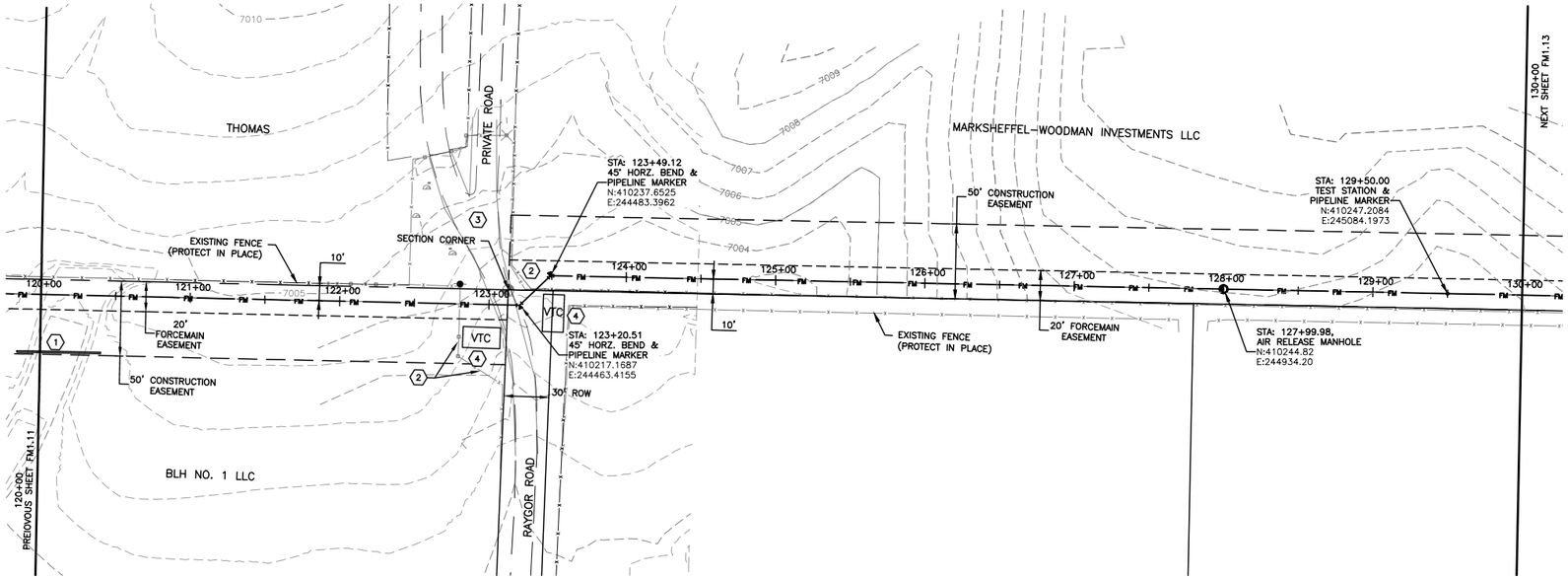

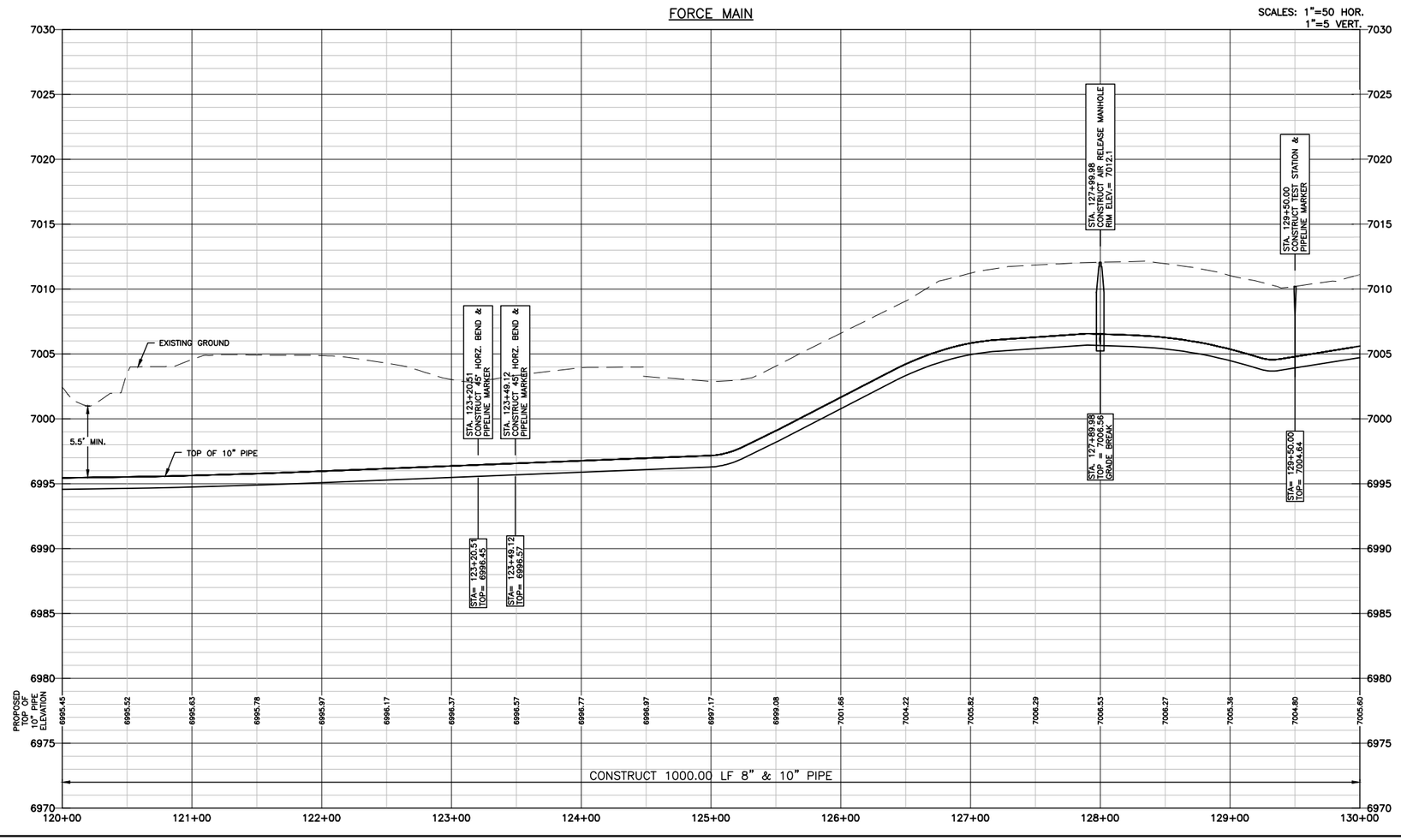

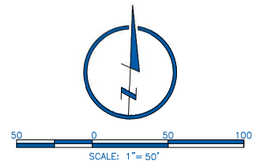

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KEYNOTES:

1. SEDIMENT CONTROL LOG PER DETAIL SHEET FM2.4
2. REMOVE AND RE-INSTALL 115 LF OF EXISTING FENCE.
3. CONTRACTOR SHALL KEEP ACCESS OPEN TO ALL RESIDENTIAL LOTS AT ALL TIMES. CONTRACTOR SHALL NOTIFY AND COORDINATE ACCESS WITH ALL PROPERTY OWNERS.
4. VEHICLE TRACKING CONTROL PER SHEET FM2.4

DRAWN BY: JPM
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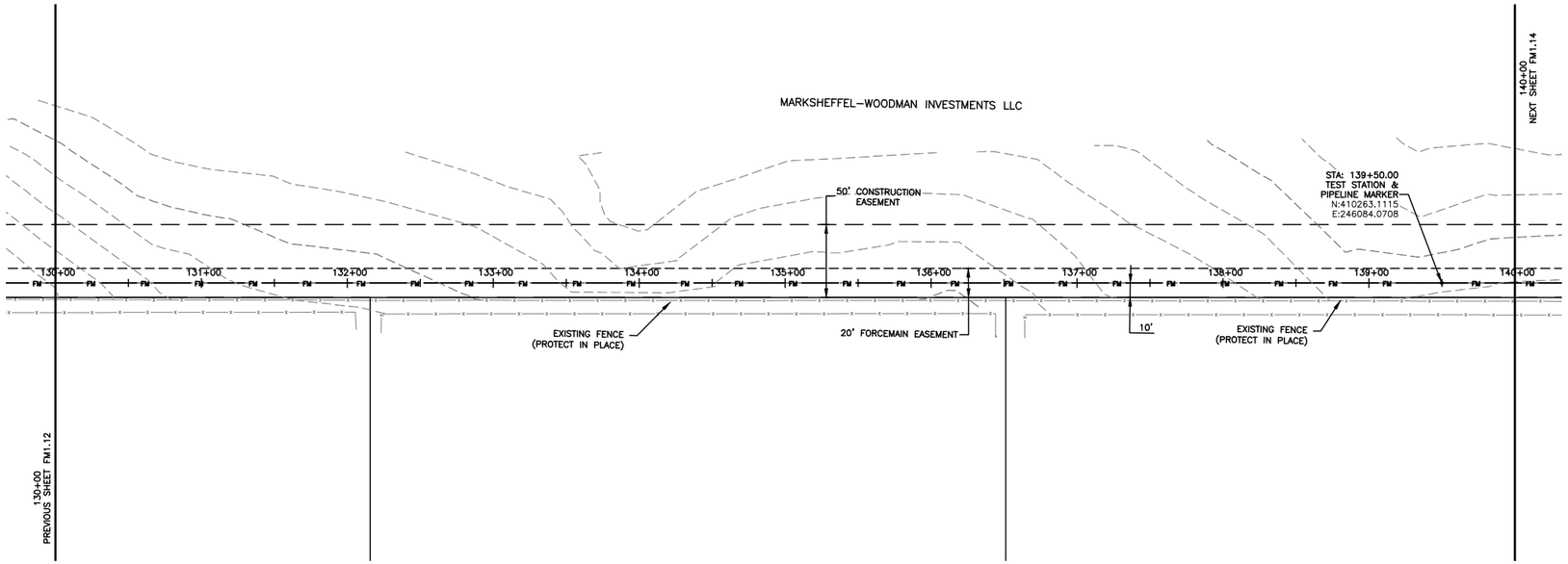
SHEET
FM1.12

COLORADO 811 KNOW WHAT'S BELOW. CALL BEFORE YOU DIG.



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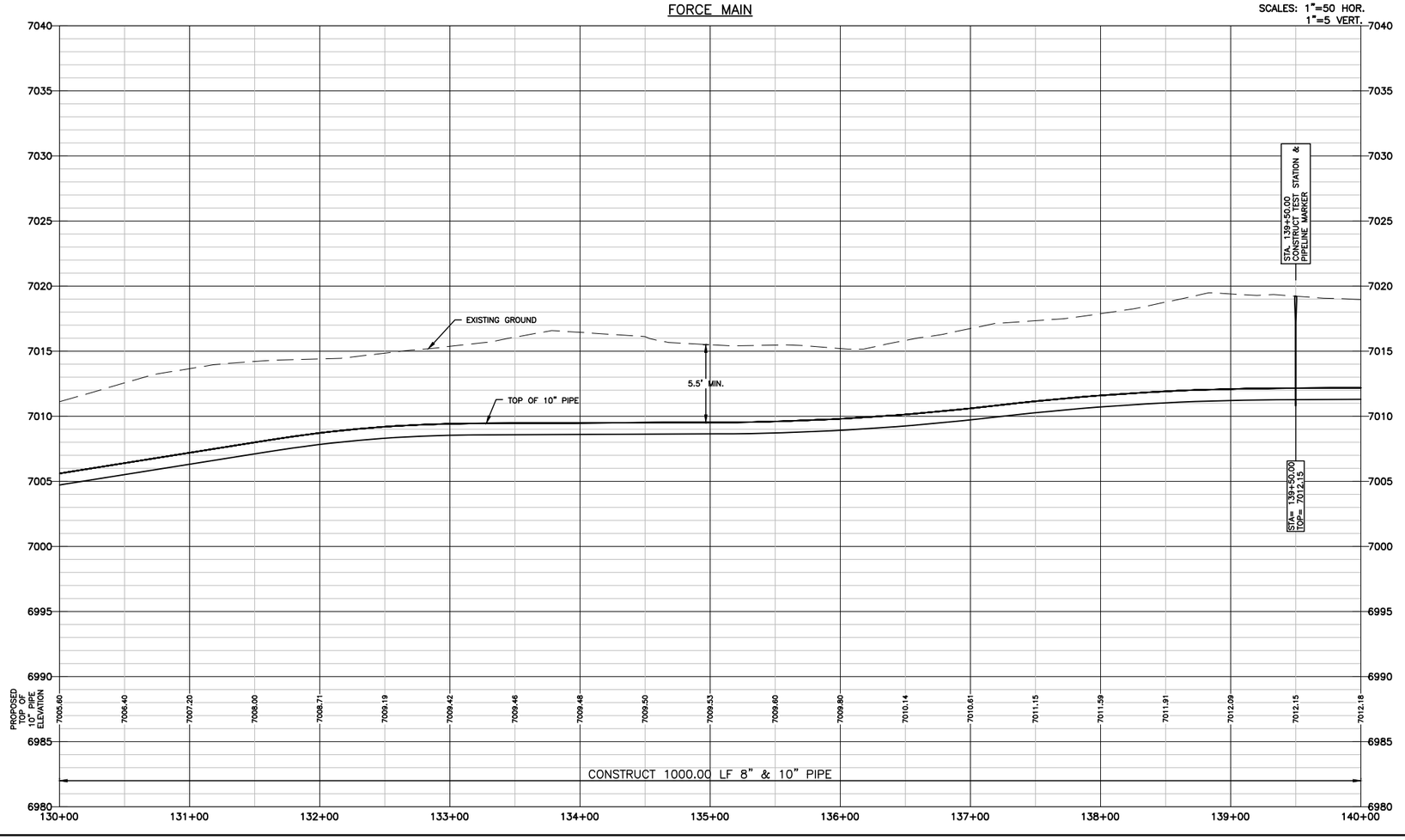

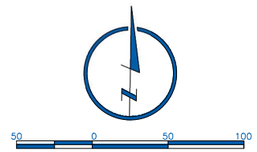

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FM1.13

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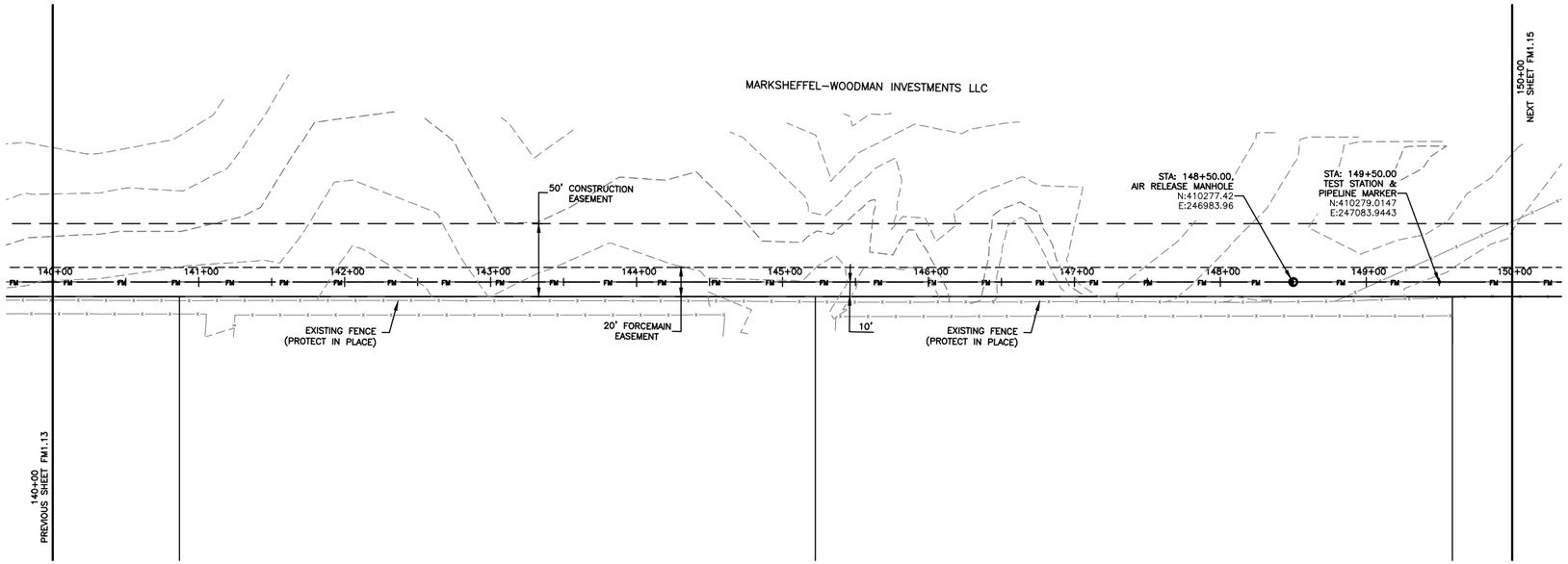

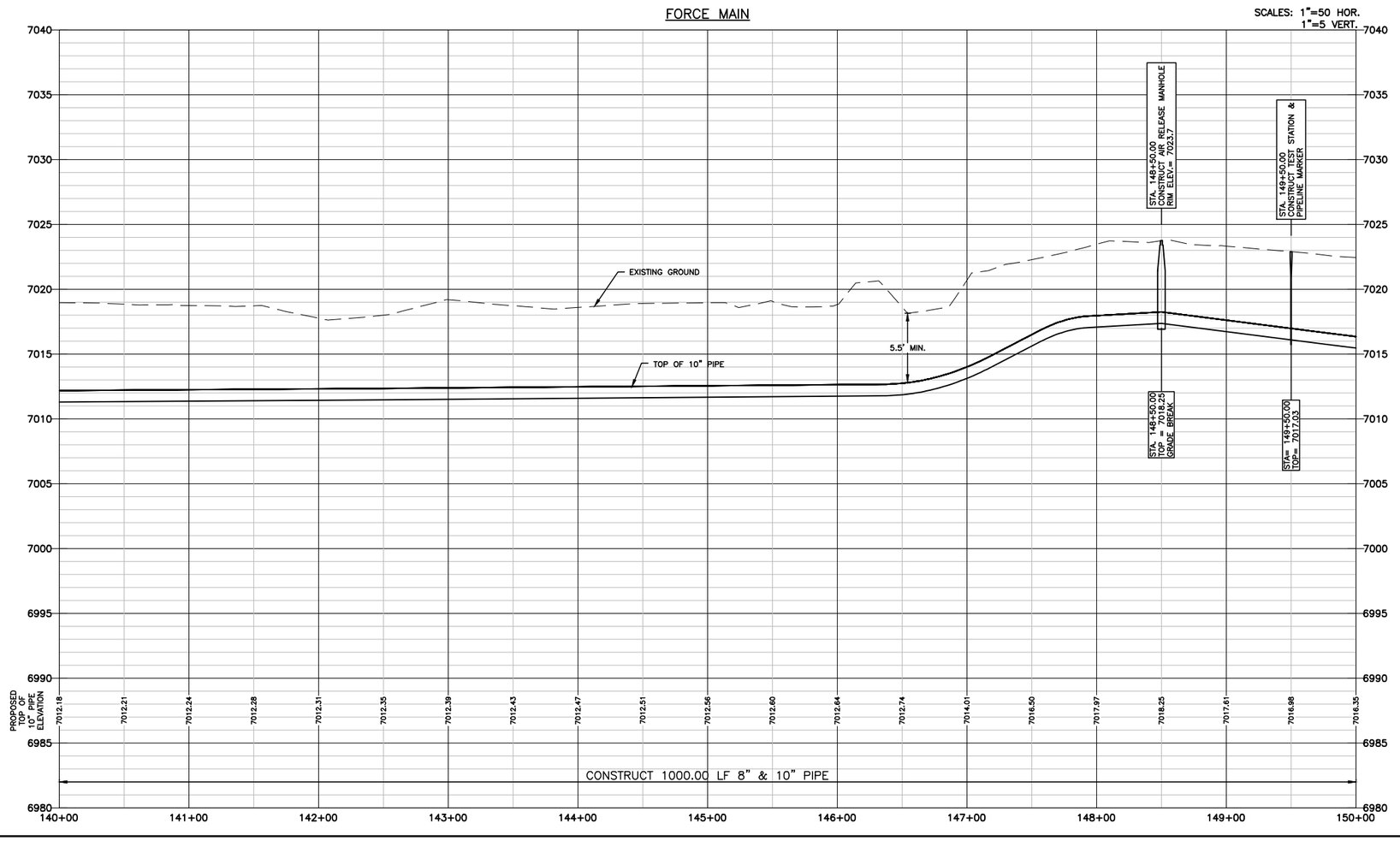

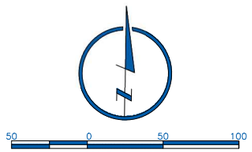

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SHEET
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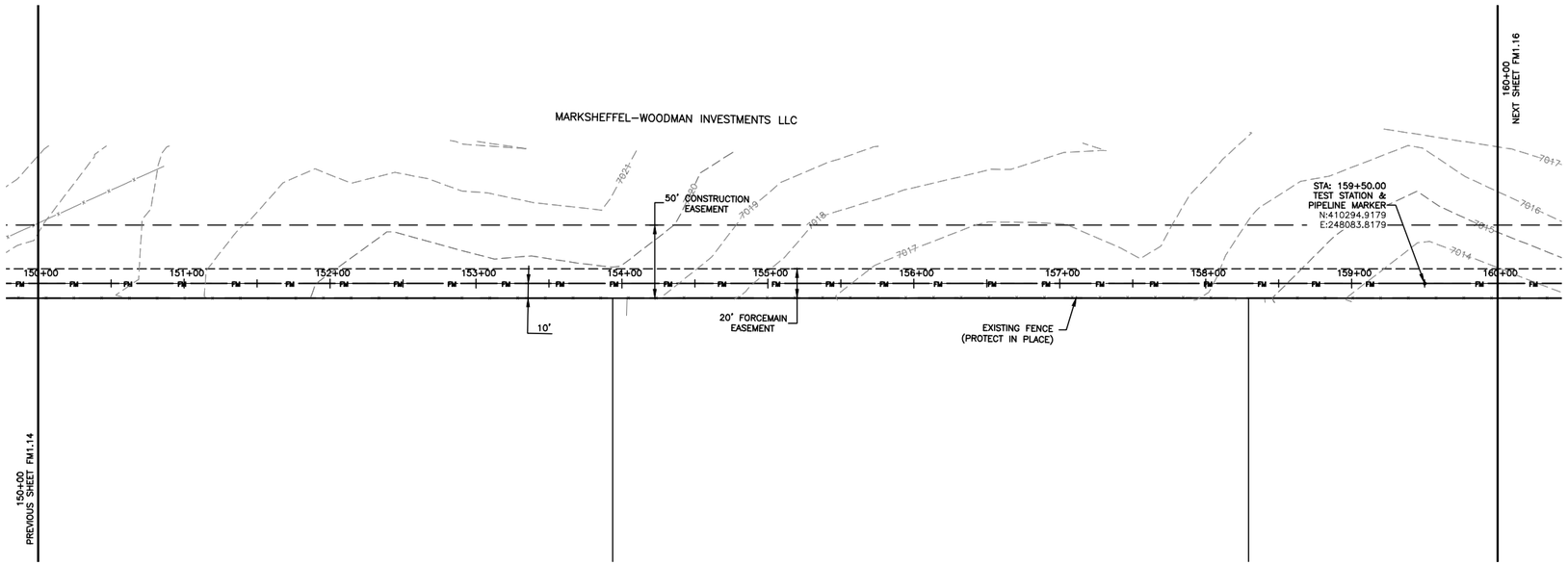
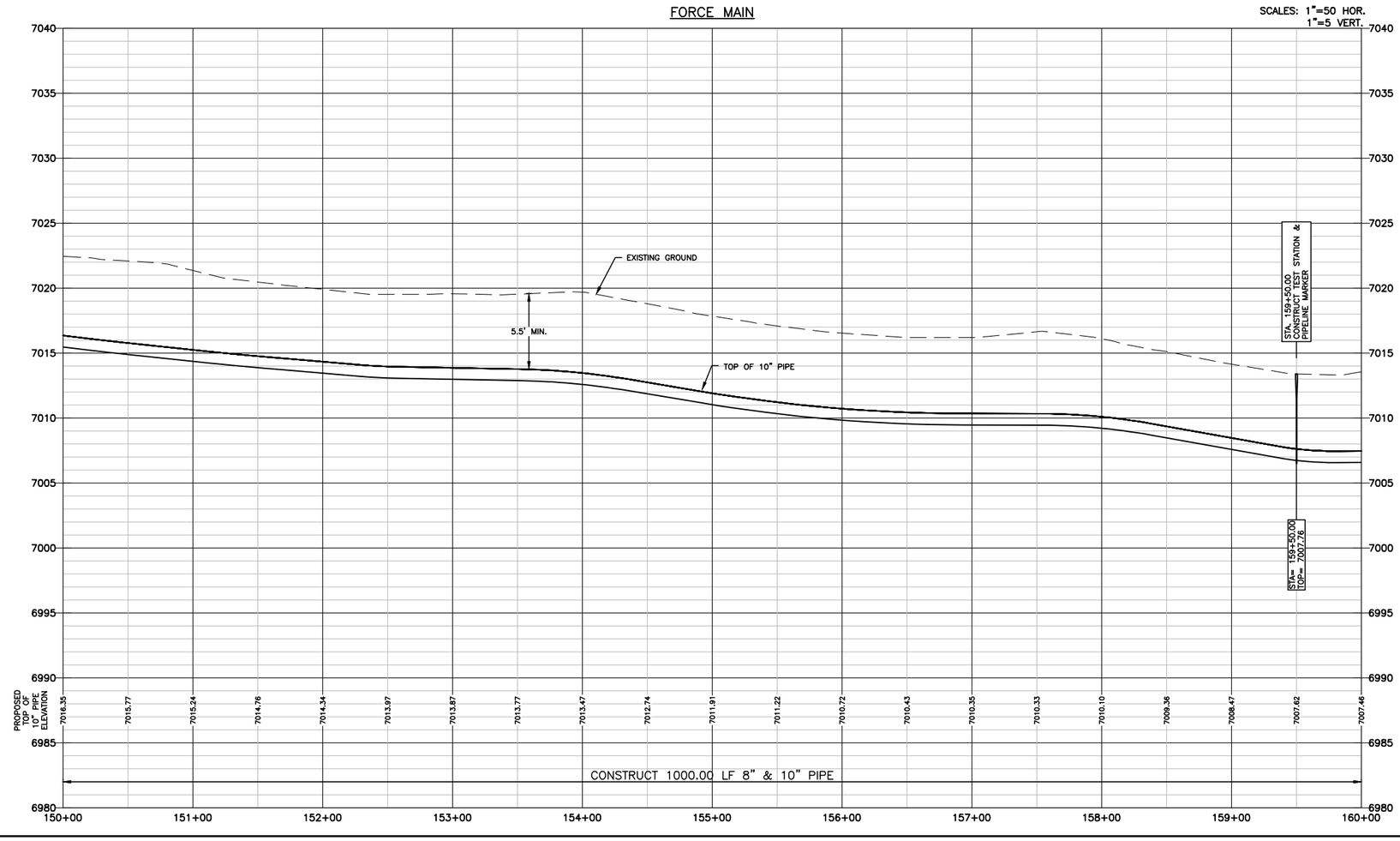
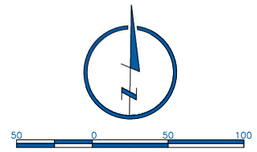
P:_Engineering\0416011 Sterling Ranch Lift Station\DRAWINGS\CONSTRUCTION DRAWINGS\0416011-SAN-002.dwg, 4/21/2017 2:47:22 PM, JASON MCNEILL, LAMP RYNEARSON & ASSOCIATES







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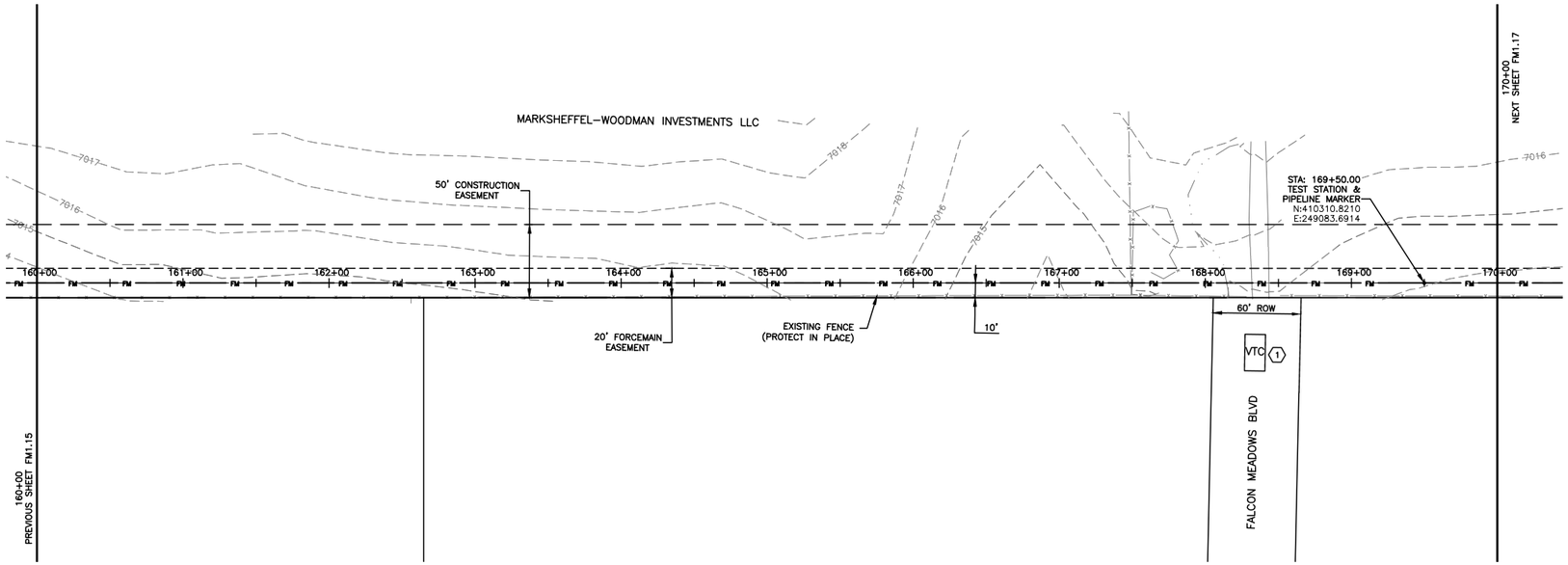

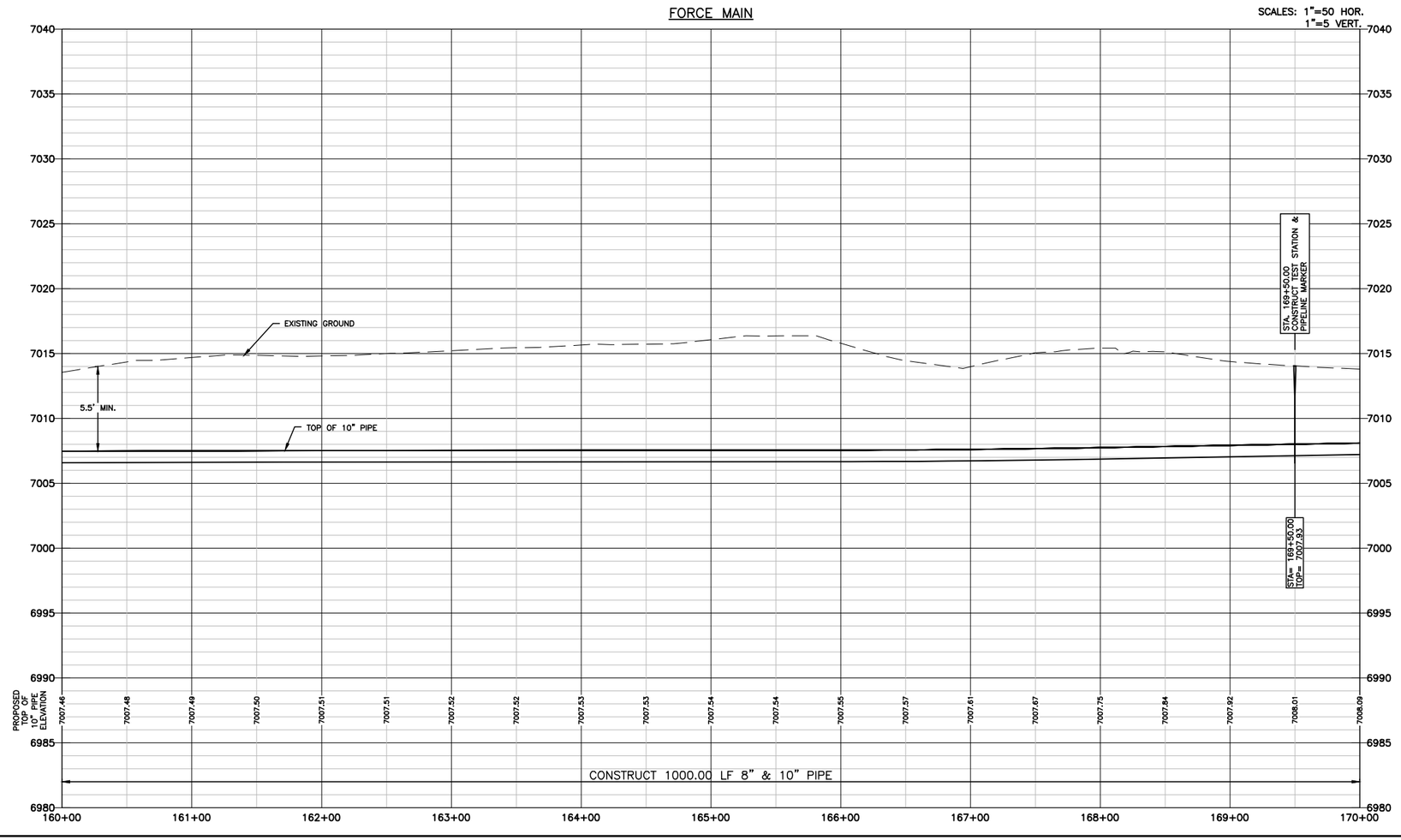

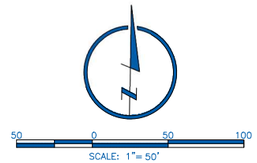

NOTES:

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8. CONTRACTOR SHALL BLADE A SMALL 6" HIGH BERM ALONG THE DOWNSTREAM SIDE OF TRENCHING OPERATIONS TO CONTROL STORM DRAINAGE FLOWS AND MINIMIZE TRANSPORTATION SEDIMENT DOWNSTREAM. SEE DETAIL SHEET FM2.4.
9. CONTRACTOR SHALL RESEED ALL AREAS DISTURBED DURING CONSTRUCTION, INCLUDING ANY SOD AND/OR LANDSCAPING.
10. CONTRACTOR SHALL PROTECT IN PLACE OR REMOVE AND REPLACE ANY SIGNS, MAILBOXES, LANDSCAPING, OR OTHER OBSTRUCTIONS DISTURBED DURING CONSTRUCTION.

KEYNOTES:

(1) VEHICLE TRACKING CONTROL PER SHEET FM2.4

DRAWN BY: JPM
DESIGNED BY: JPM
DATE: APRIL 24, 2017
JOB NUMBER-TASK#: 0416011
BOOK AND PAGE:
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STERLING RANCH LIFT STATION AND FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

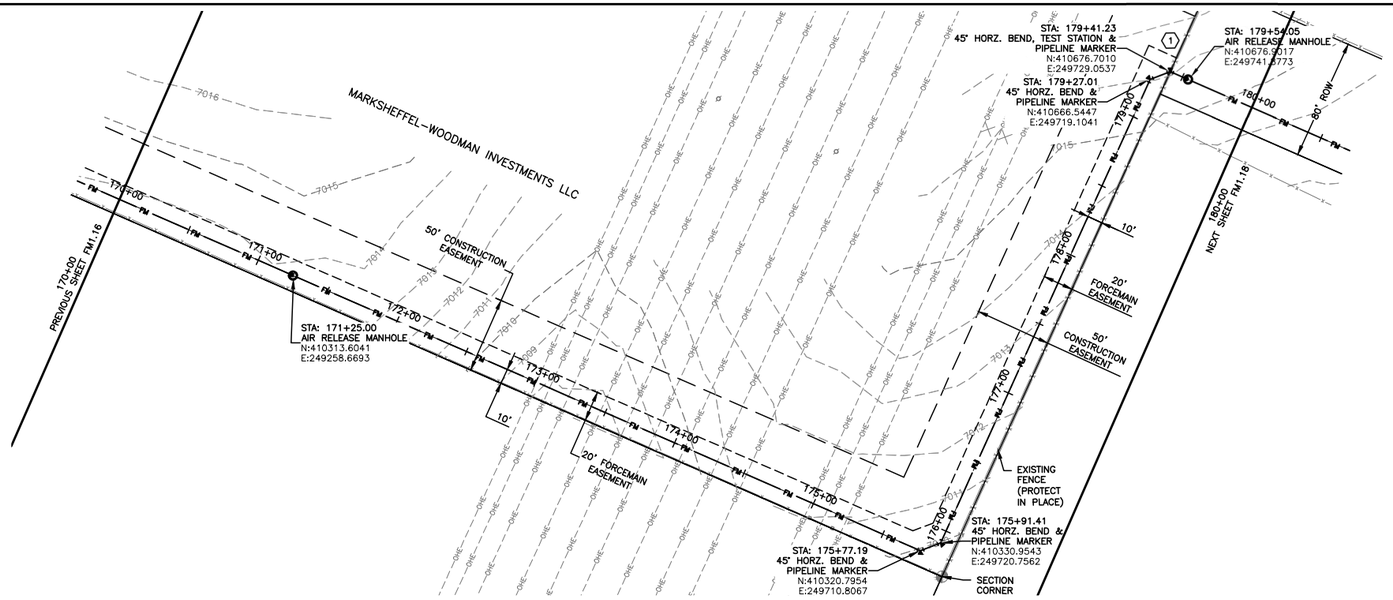
FORCE MAIN PLAN & PROFILE
STA. 160+00 TO STA. 170+00

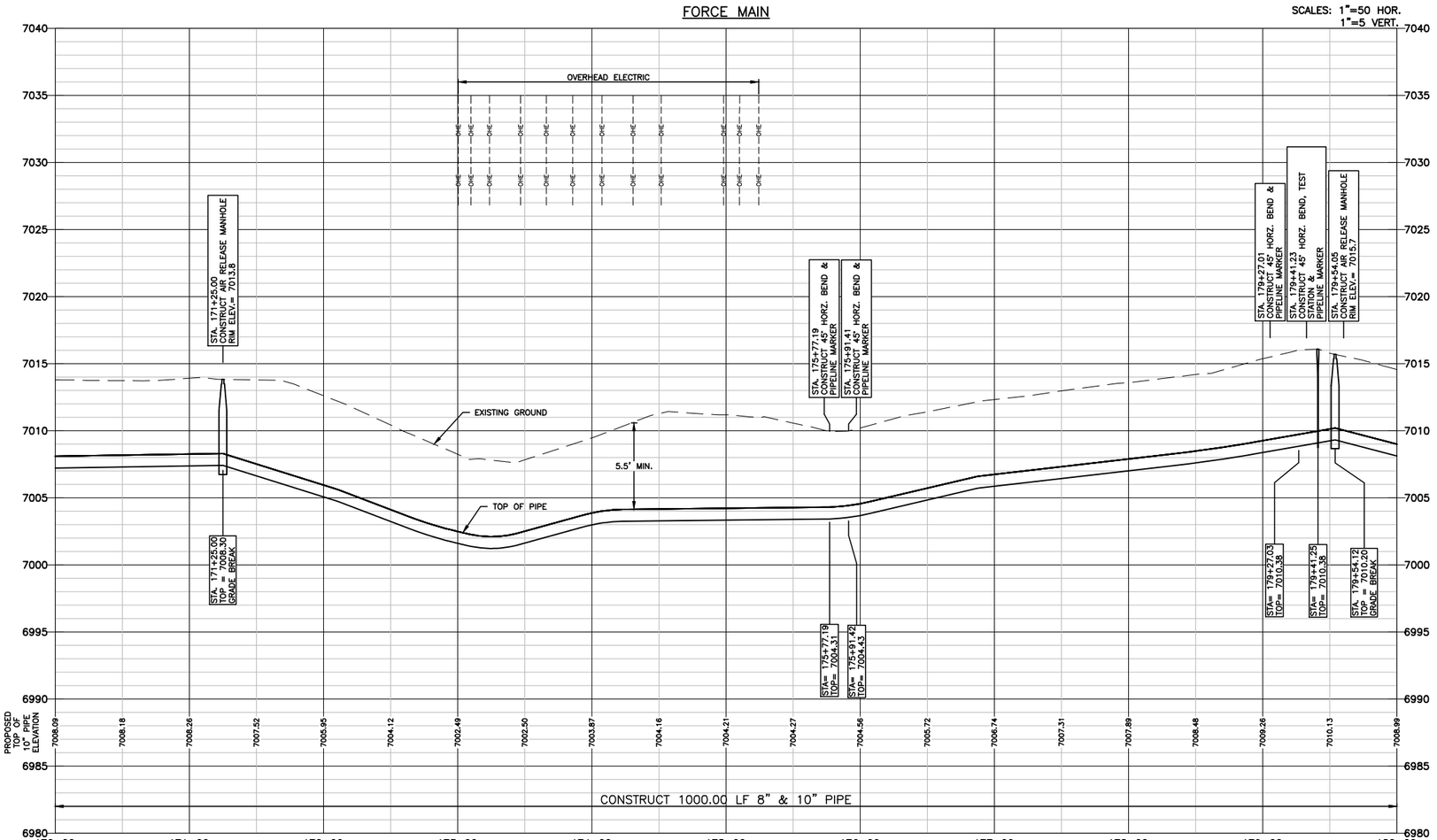
LAMP RYNEARSON - ENGINEERS

BRADLEY A. SIMONS
34705

SHEET
FM1.16

COLORADO 811 KNOW WHAT'S BELOW. CALL BEFORE YOU DIG.





50 0 50 100
SCALE: 1"= 50'

NOTES:

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KEYNOTES:

(1) REMOVE & RE-INSTALL 50 LF OF EXISTING FENCING.

DRAWN BY	JPM
DESIGNED BY	JPM
DATE	APRIL 24, 2017
JOB NUMBER-TASK#	0416011
BOOK AND PAGE	

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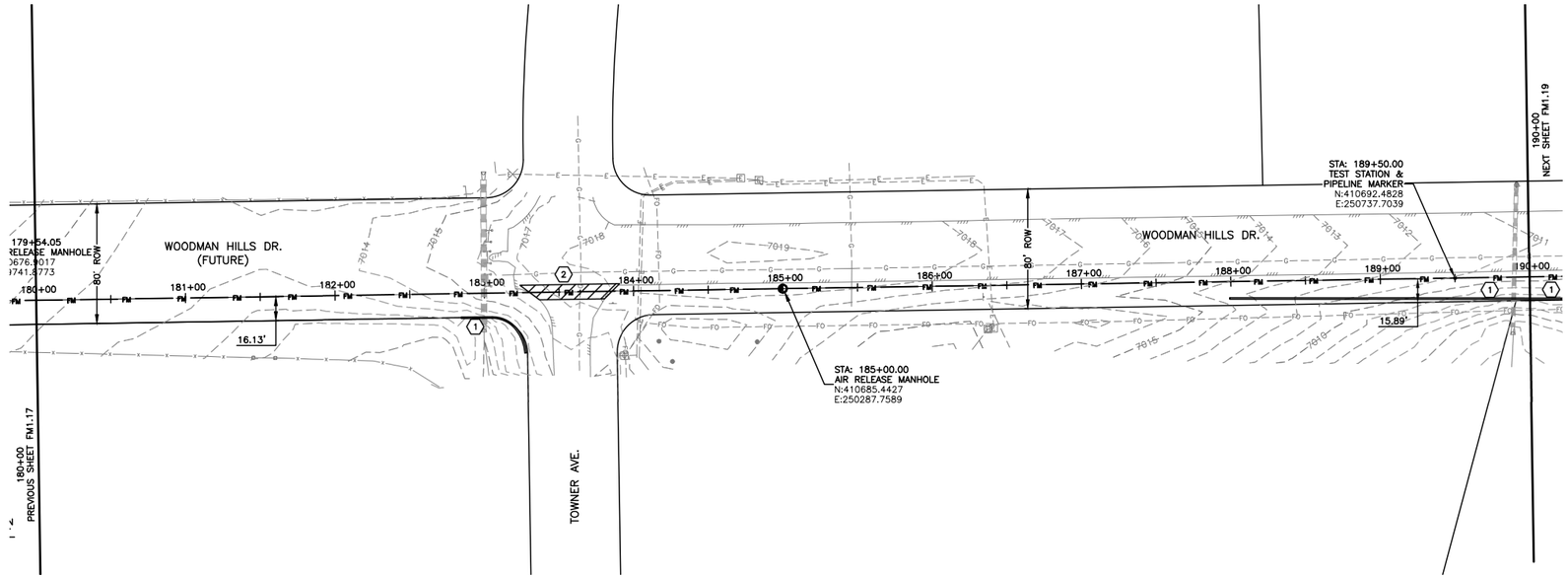
STERLING RANCH LIFT STATION AND FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

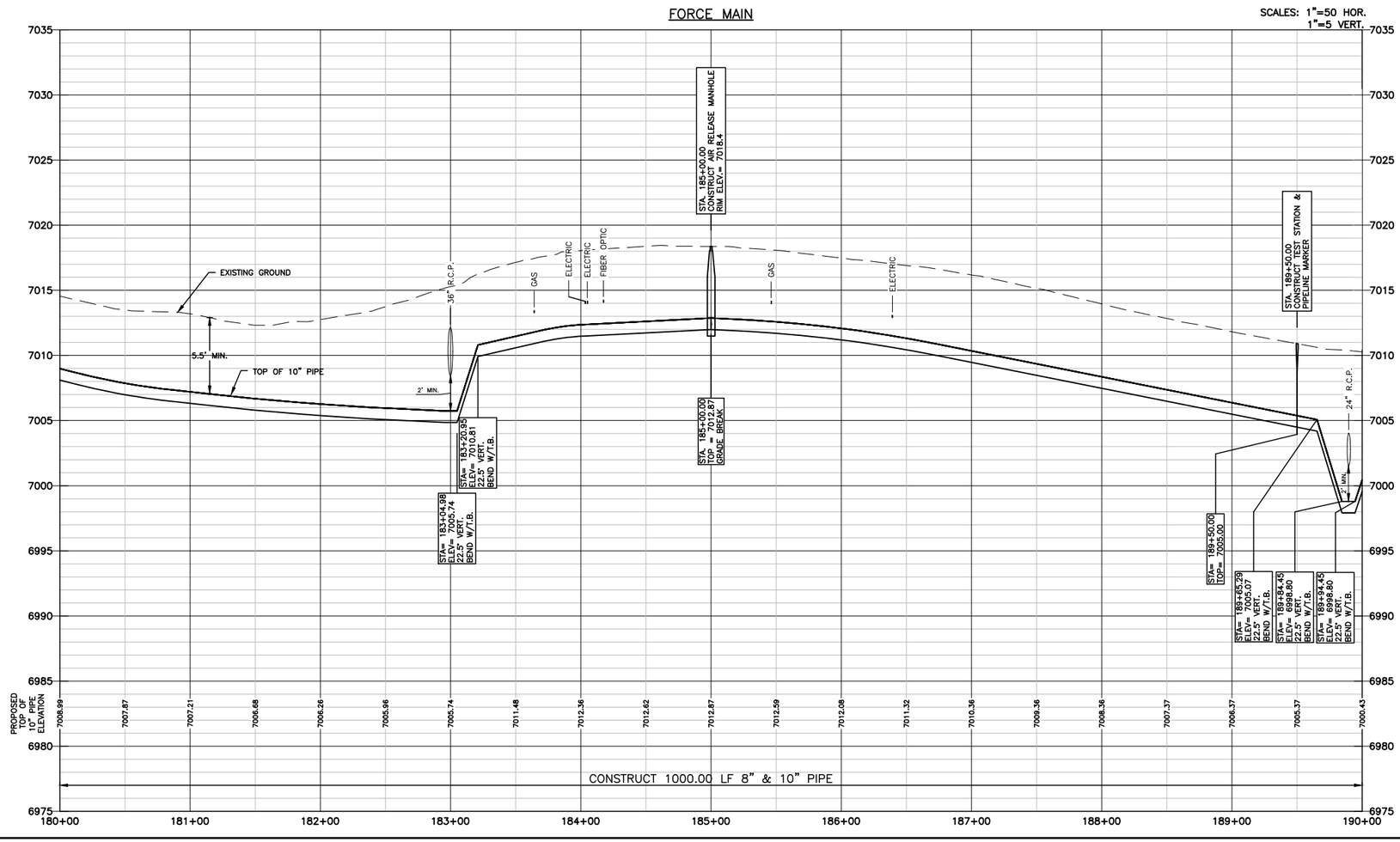
FORCE MAIN PLAN & PROFILE
STA. 170+00 TO STA. 180+00

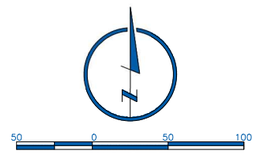
LAMP RYNEARSON - ENGINEERS

COLORADO 811 KNOW WHAT'S BELOW. CALL BEFORE YOU DIG.

SHEET
FM1.17







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KEYNOTES:

(1) SEDIMENT CONTROL LOG PER DETAIL SHEET FM2.4

(2) CONTRACTOR SHALL SAW CUT, REMOVE & REPLACE EXISTING PAVEMENT PER EL PASO COUNTY SPECIFICATIONS.

DRAWN BY: JPM
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DATE: APRIL 24, 2017
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BOOK AND PAGE:

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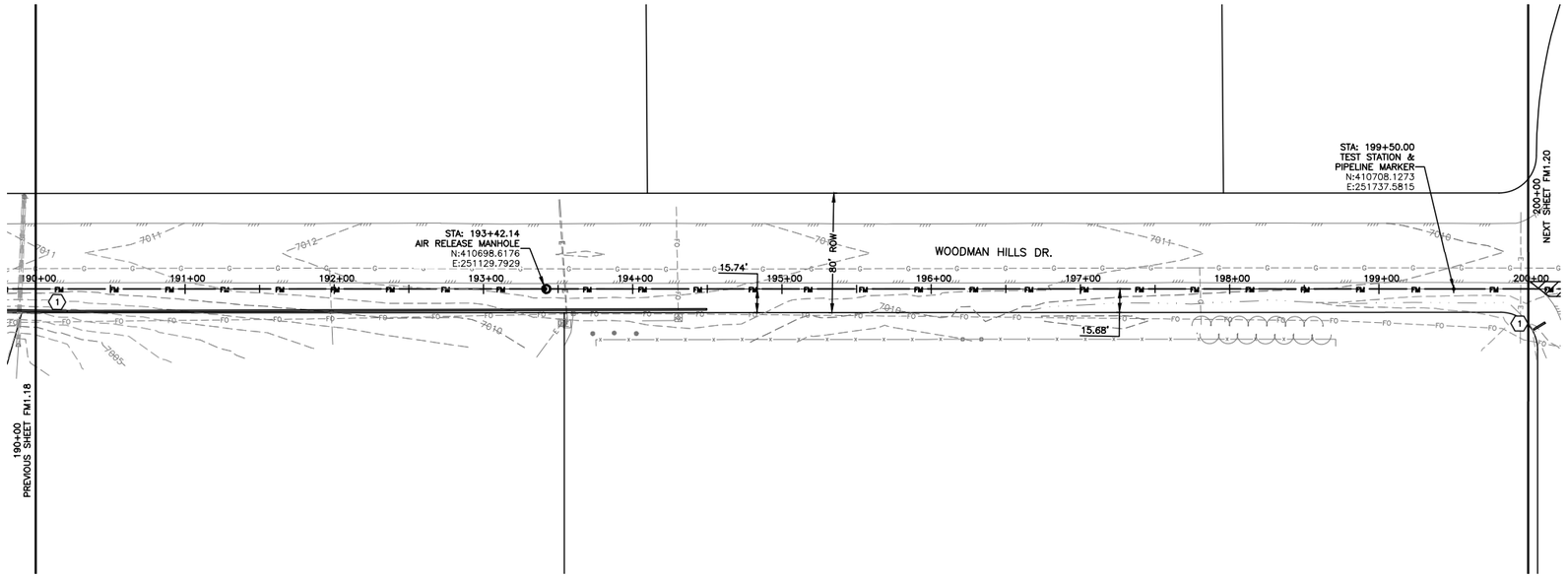
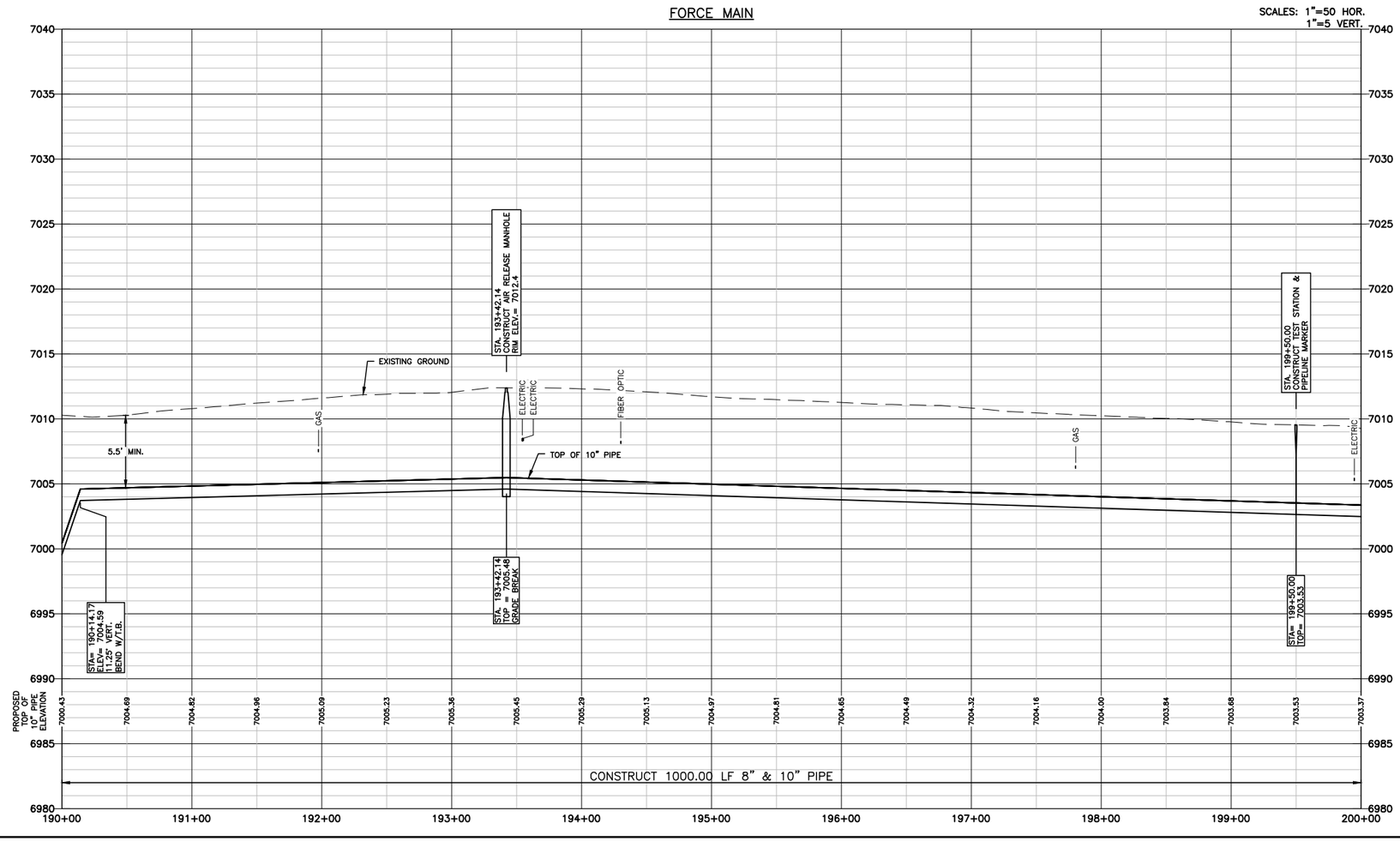
FORCE MAIN PLAN & PROFILE
STA. 180+00 TO STA. 190+00

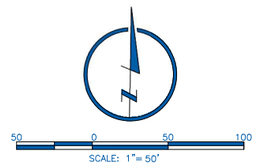
LAMP RYNEARSON - ENGINEERS

BRADLEY A. SIMONS
34705

SHEET
FM1.18







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KEYNOTES:

(1) SEDIMENT CONTROL LOG PER DETAIL SHEET FM2.4

DRAWN BY: JPM
DESIGNED BY: JPM
DATE: APRIL 24, 2017
JOB NUMBER-TASK#: 0416011
BOOK AND PAGE:

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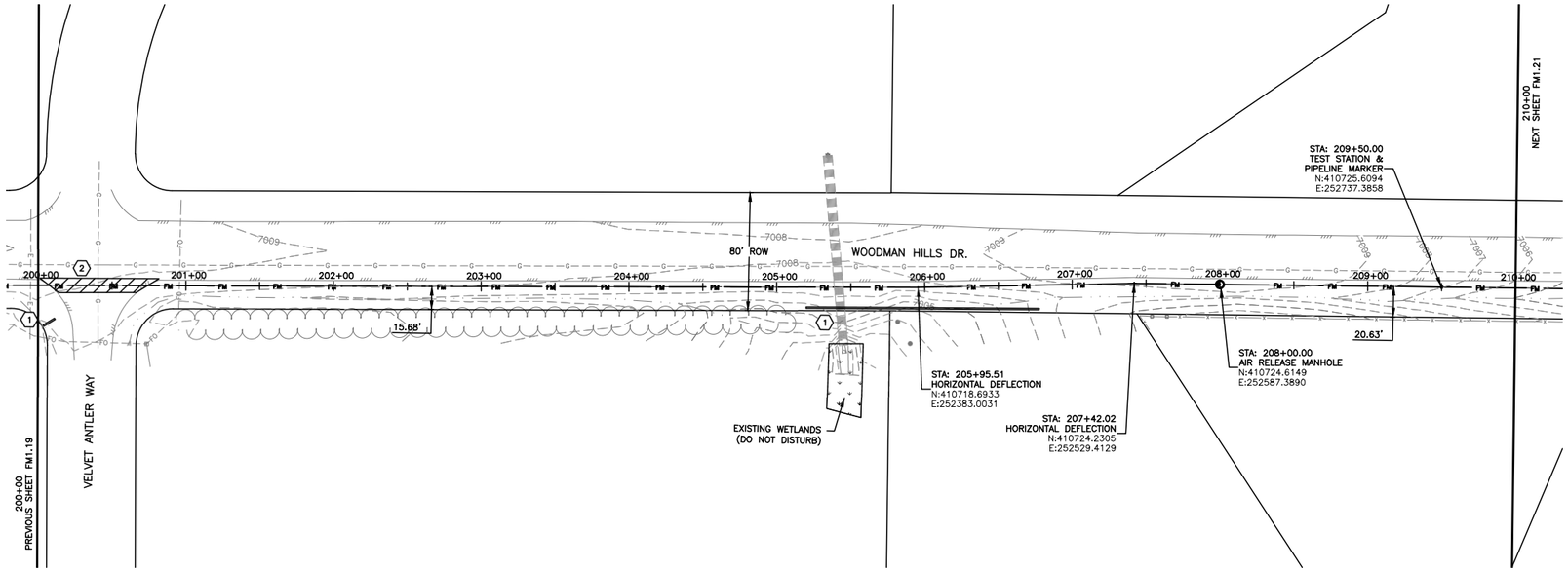
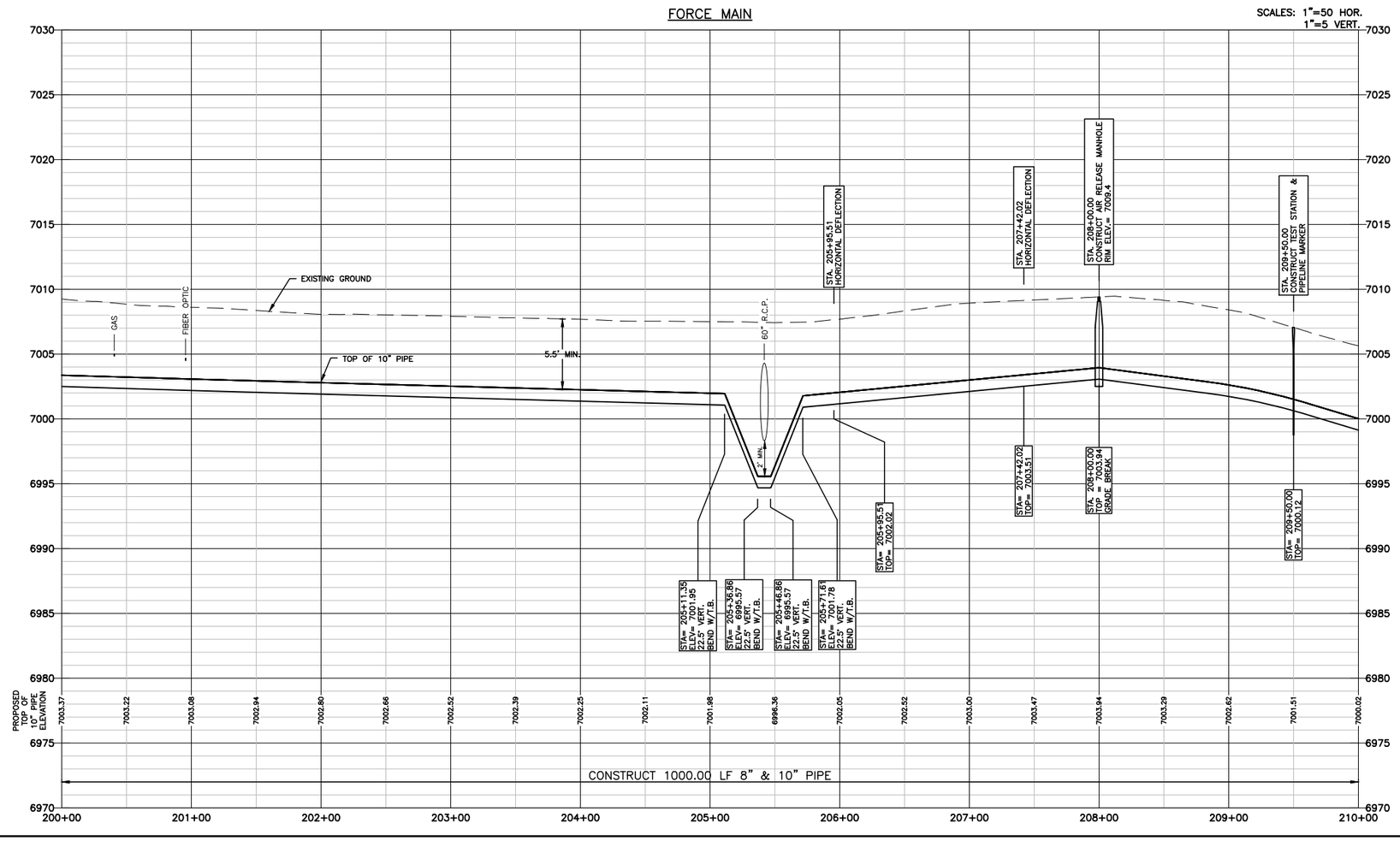
FORCE MAIN PLAN & PROFILE
STA. 190+00 TO STA. 200+00

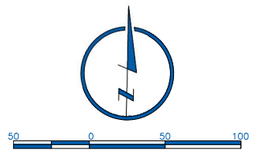
LAMP RYNEARSON - ENGINEERS

BRADLEY A. SIMONS
34705

SHEET
FM1.19







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KEYNOTES:

(1) SEDIMENT CONTROL LOG PER DETAIL SHEET FM2.4

(2) CONTRACTOR SHALL SAW CUT, REMOVE & REPLACE EXISTING PAVEMENT PER EL PASO COUNTY SPECIFICATIONS.

DRAWN BY	JPM
DESIGNED BY	JPM
DATE	APRIL 24, 2017
JOB NUMBER-TASK#	0416011
BOOK AND PAGE	

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STERLING RANCH LIFT STATION AND FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

FORCE MAIN PLAN & PROFILE
STA. 200+00 TO STA. 210+00

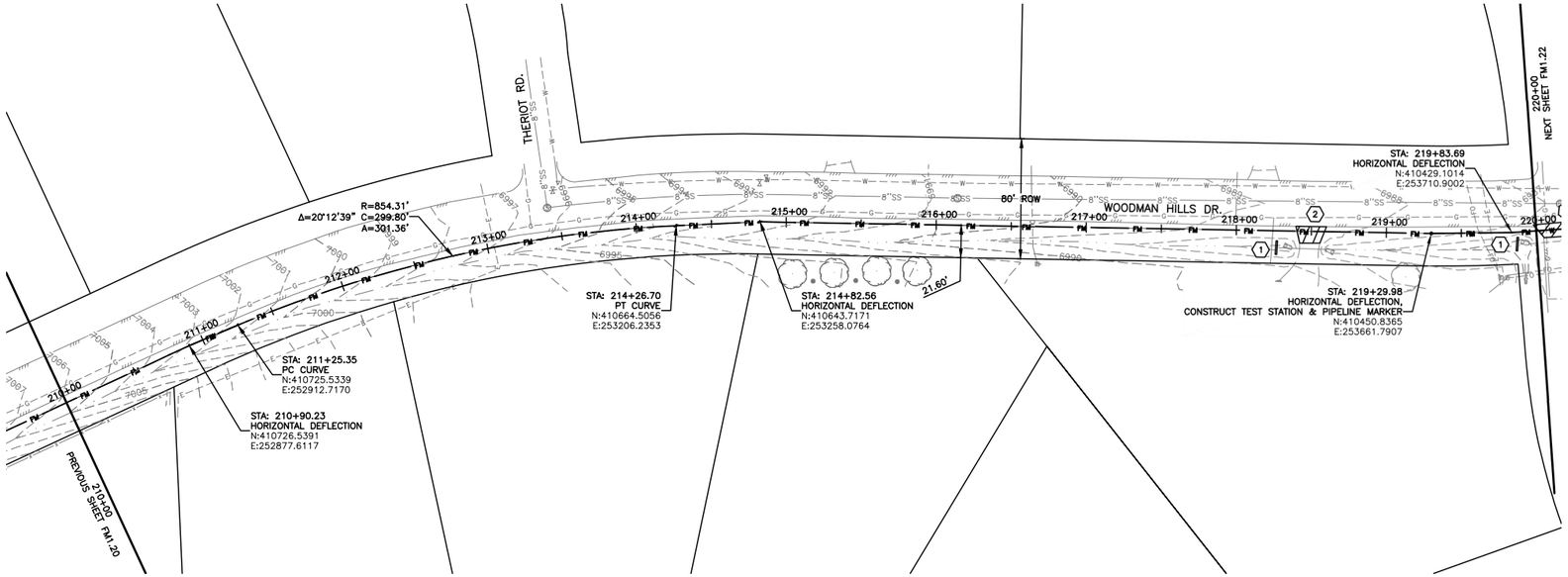
LAMP RYNEARSON - ENGINEERS

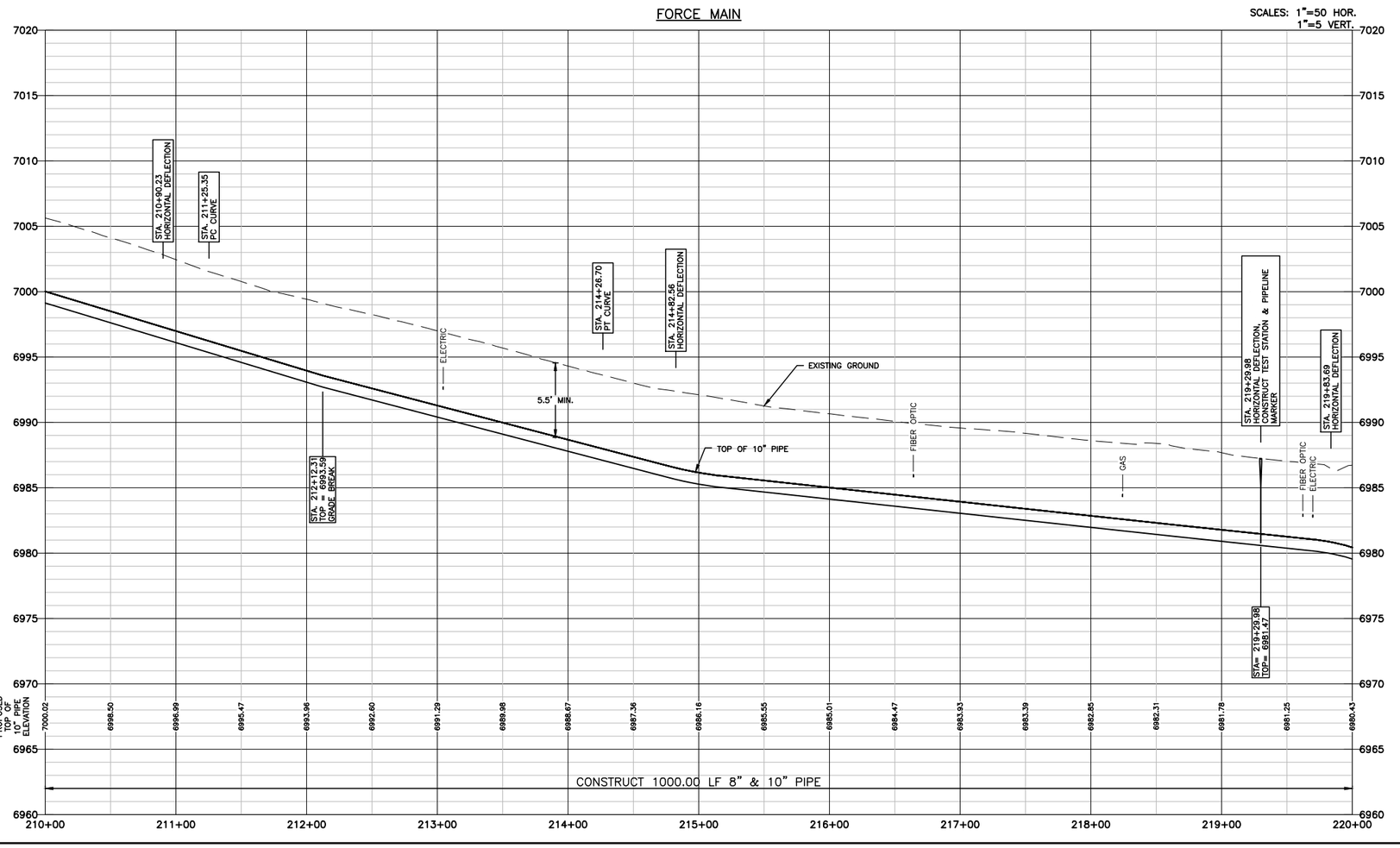
BRADLEY A. SIMONS
34705

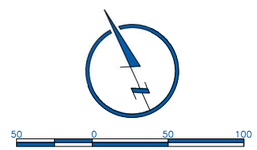
SHEET
FM1.20

COLORADO 811 KNOW WHAT'S BELOW. CALL BEFORE YOU DIG.

P:_Engineering\0416011 Sterling Ranch Lift Station\DRAWINGS\CONSTRUCTION DRAWINGS\0416011-SAN-002.dwg, 4/21/2017 2:52:31 PM, JASON MCNEILL, LAMP RYNEARSON & ASSOCIATES







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KEYNOTES:

(1) SEDIMENT CONTROL LOG PER DETAIL SHEET FM2.4

(2) CONTRACTOR SHALL SAW CUT, REMOVE AND REPLACE EXISTING CONCRETE DRIVEWAY.

DRAWN BY: JPM
DESIGNED BY: JPM
DATE: APRIL 24, 2017
JOB NUMBER-TASK#: 0416011
BOOK AND PAGE:

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STERLING RANCH LIFT STATION AND FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

FORCE MAIN PLAN & PROFILE
STA. 210+00 TO STA. 220+00

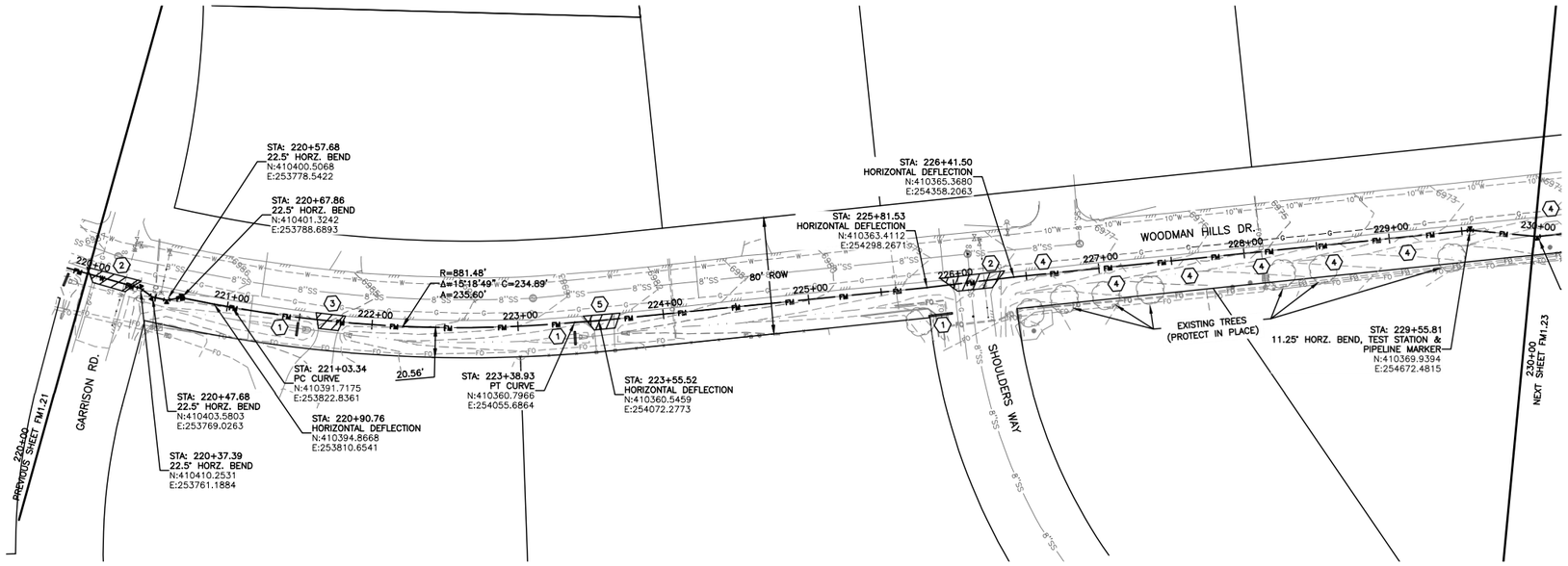
LAMP RYNEARSON - ENGINEERS

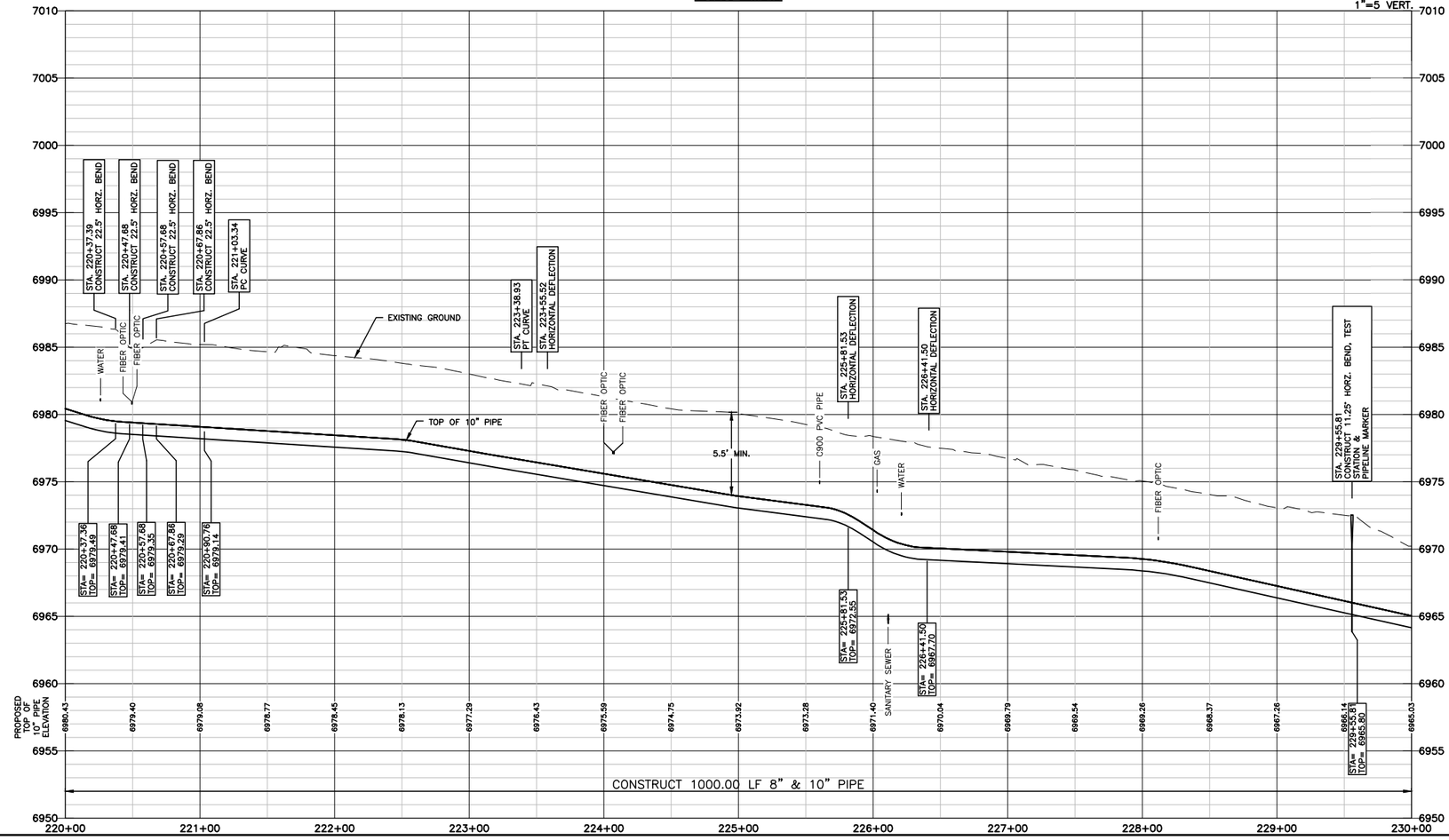
BRADLEY A. SIMONS
34705

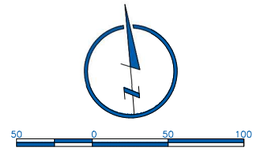
SHEET
FM1.21

COLORADO 811 KNOW WHAT'S BELOW. CALL BEFORE YOU DIG.

P:_Engineering\0416011 Sterling Ranch Lift Station\DRAWINGS\CONSTRUCTION DRAWINGS\0416011-SAN-002.dwg, 4/21/2017 2:53:23 PM, JASON MCNELL, LAMP RYNEARSON & ASSOCIATES







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KEYNOTES:

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3. CONTRACTOR SHALL SAW CUT, REMOVE AND REPLACE EXISTING CONCRETE DRIVEWAY.
4. CONTRACTOR SHALL REMOVE AND REPLACE EXISTING DECORATIVE FENCE.
5. CONTRACTOR SHALL REMOVE AND REPLACE EXISTING GRAVEL DRIVEWAY.

DRAWN BY: JPM
DESIGNED BY: JPM
DATE: APRIL 24, 2017
JOB NUMBER-TASK#: 0416011
BOOK AND PAGE:

REVISIONS

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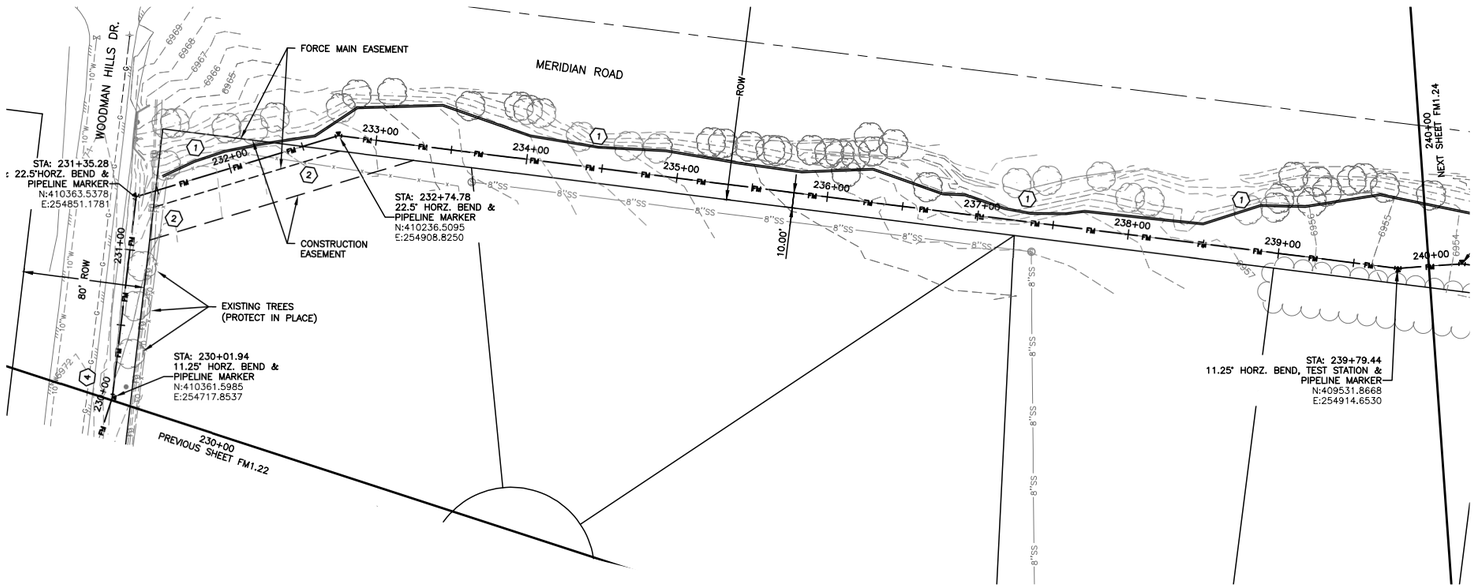
STERLING RANCH METROPOLITAN DISTRICT NO. 1

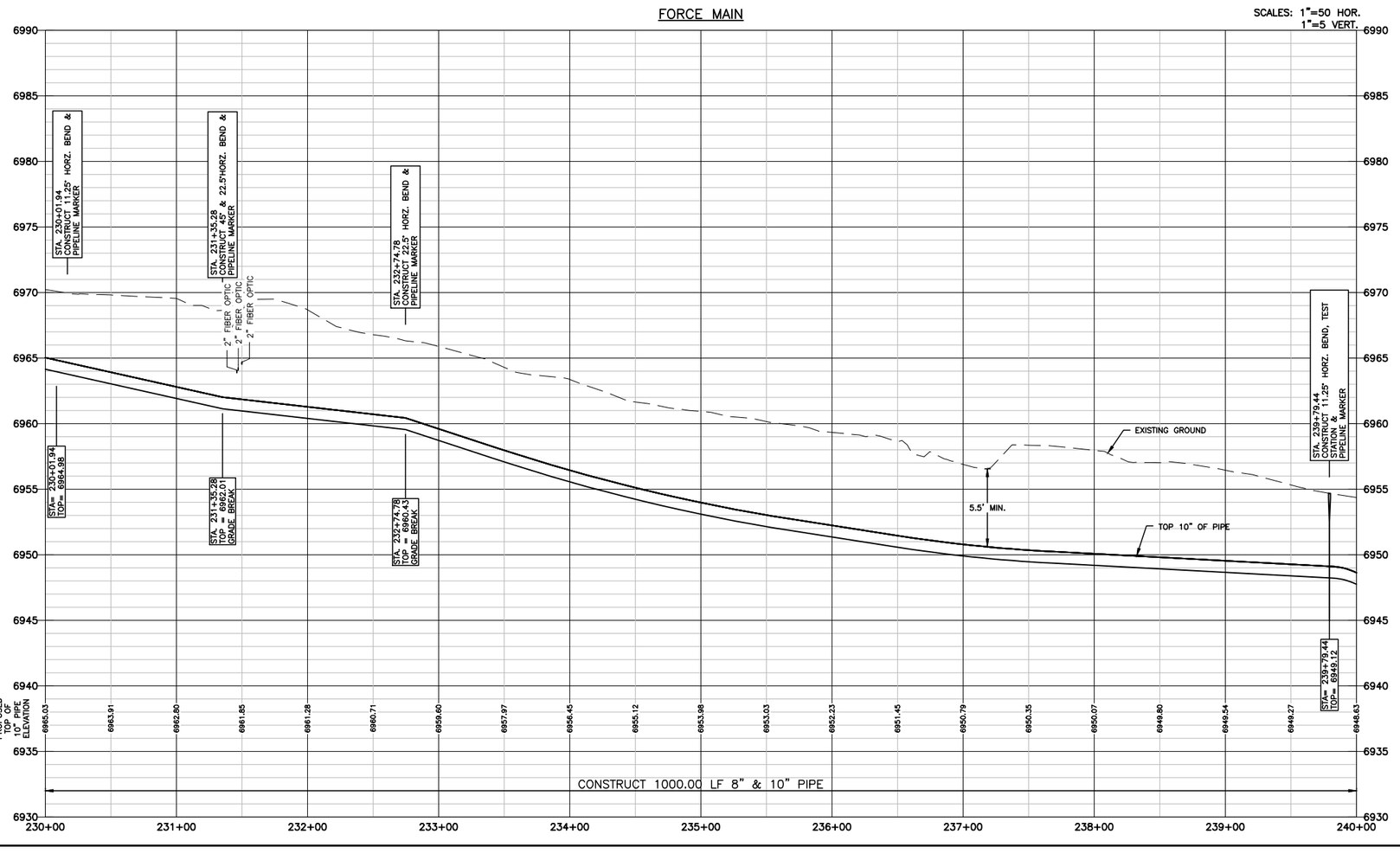
FORCE MAIN PLAN & PROFILE
STA. 220+00 TO STA. 230+00

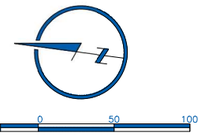
LAMP RYNEARSON - ENGINEERS

BRADLEY A. SIMONS
34705

SHEET
FM1.22







NOTES:

1. SEE SHEET G0.2 FOR GENERAL NOTES.
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10. CONTRACTOR SHALL PROTECT IN PLACE OR REMOVE AND REPLACE ANY SIGNS, MAILBOXES, LANDSCAPING, OR OTHER OBSTRUCTIONS DISTURBED DURING CONSTRUCTION.

KEYNOTES:

(1) SEDIMENT CONTROL LOG PER DETAIL SHEET FM2.4

(2) REMOVE AND REPLACE 180 L.F. OF EXISTING FENCE.

(3) NOT USED.

(4) CONTRACTOR SHALL REMOVE AND RE-INSTALL EXISTING DECORATIVE FENCE.

DRAWN BY: JPM.
DESIGNED BY: JPM.
DATE: APRIL 24, 2017
JOB NUMBER-TASK#: 0416011
BOOK AND PAGE:

REVISIONS

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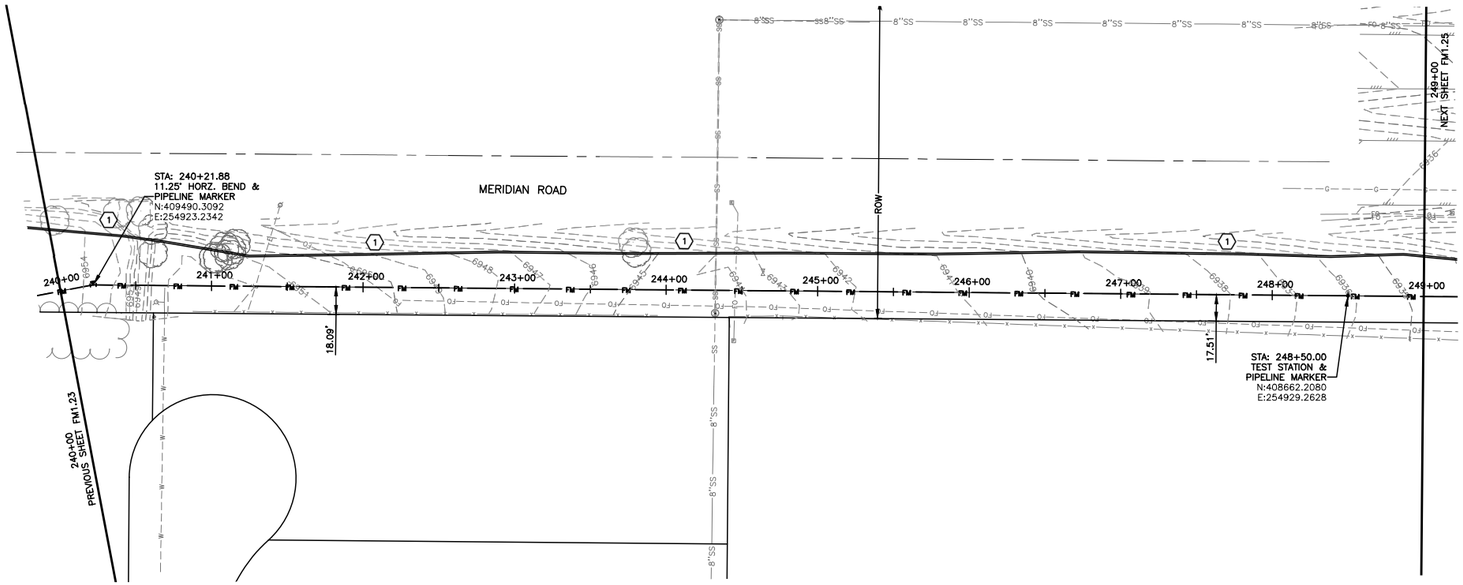
STERLING RANCH LIFT STATION AND FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

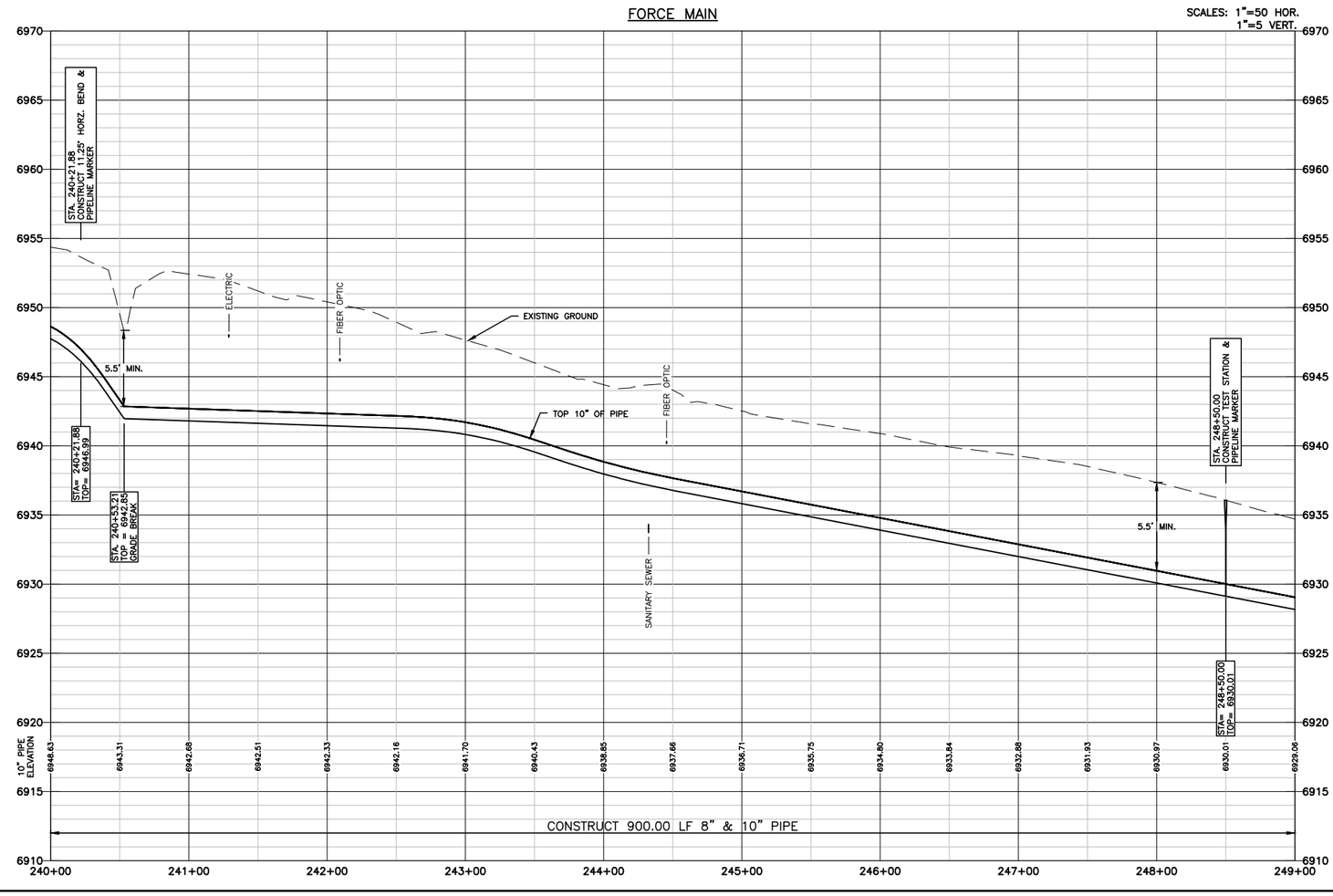
FORCE MAIN PLAN & PROFILE
STA. 230+00 TO STA. 240+00

LAMP RYNEARSON - ENGINEERS

BRADLEY A. SIMONS
34705

SHEET
FM1.23





50 0 50 100
SCALE: 1"= 50'

NOTES:

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KEYNOTES:

(1) SEDIMENT CONTROL LOG PER DETAIL SHEET FM2.4

DRAWN BY: JPM
DESIGNED BY: JPM
DATE: APRIL 24, 2017
JOB NUMBER-TASK#: 0416011
BOOK AND PAGE:

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STERLING RANCH LIFT STATION AND FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

FORCE MAIN PLAN & PROFILE
STA. 240+00 TO STA. 250+00

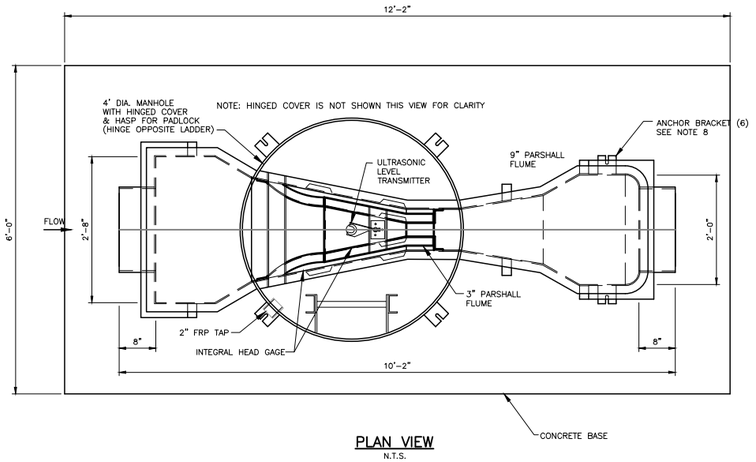
LAMP RYNEARSON - ENGINEERS

BRADLEY A. SIMONS
34705

SHEET
FM1.24

COLORADO 811 KNOW WHAT'S BELOW. CALL BEFORE YOU DIG.

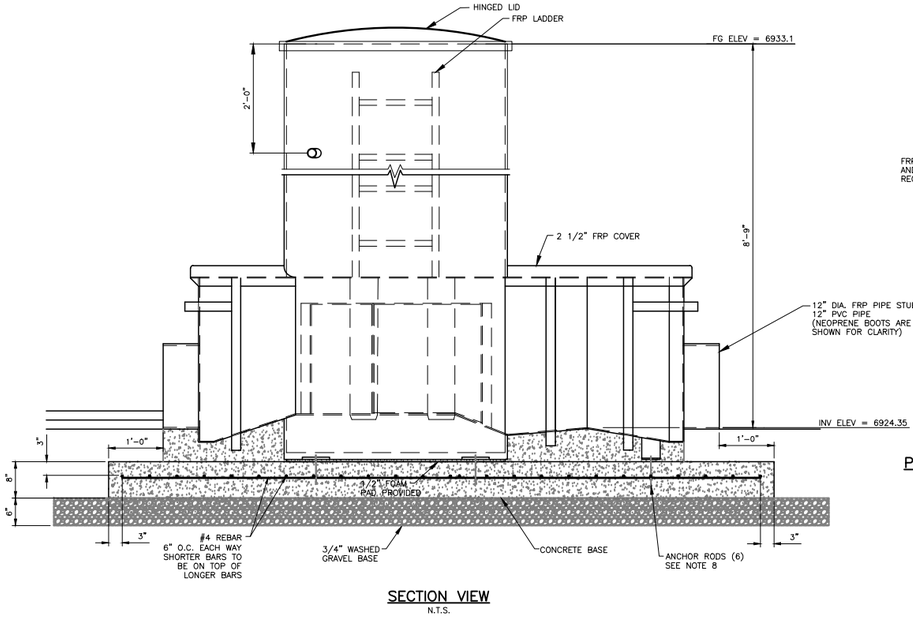
P:_Engineering\0416011 Sterling Ranch Lift Station\DRAWINGS\CONSTRUCTION DRAWINGS\0416011-SAN-002.dwg, 4/21/2017 2:56:14 PM, JASON MCNELL, LAMP RYNEARSON & ASSOCIATES



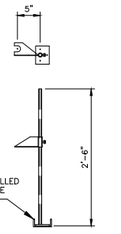
PLAN VIEW
N.T.S.

NOTES:

1. PACKAGED METERING MANHOLE SHALL BE PLASTI-FAB OR APPROVED EQUAL.
2. MATERIAL IS FRP (FIBERGLASS REINFORCED POLYESTER).
3. NEOPRENE BOOTS ARE SECURED WITH STAINLESS STEEL BANDS.
4. THE MINIMUM MANHOLE BARREL THICKNESS IS 1/2" FRP.
5. HINGE, HASP, ANCHOR BRACKET & BOLTS ARE TYPE 304 S/S.
6. A 3" PARSHALL FLUME SHALL BE INSTALLED INSIDE THE 9" PARSHALL FLUME PER MANUFACTURER'S RECOMMENDATIONS.
7. CONTRACTOR SHALL FILL MANHOLE WITH CONCRETE TO THE TOP OF THE FLUME.
8. HAS-R 304 SS OR HAS-R 316 SS ANCHOR RODS, 1/2" DIA. WITH 5" EMBEDMENT INTO CONCRETE WITH HILTI HIT-RE 500 V3 EPOXY OR APPROVED EQUAL.

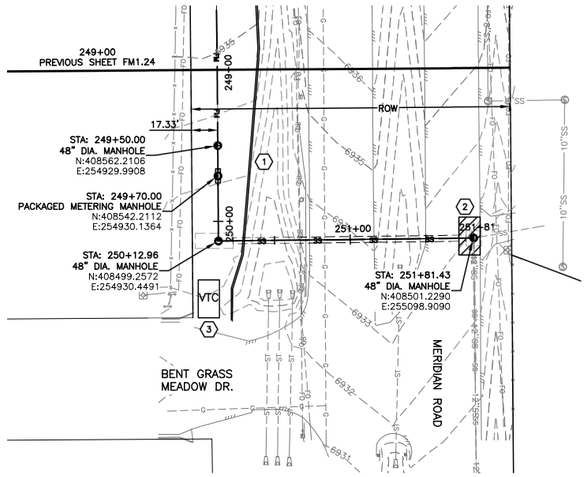


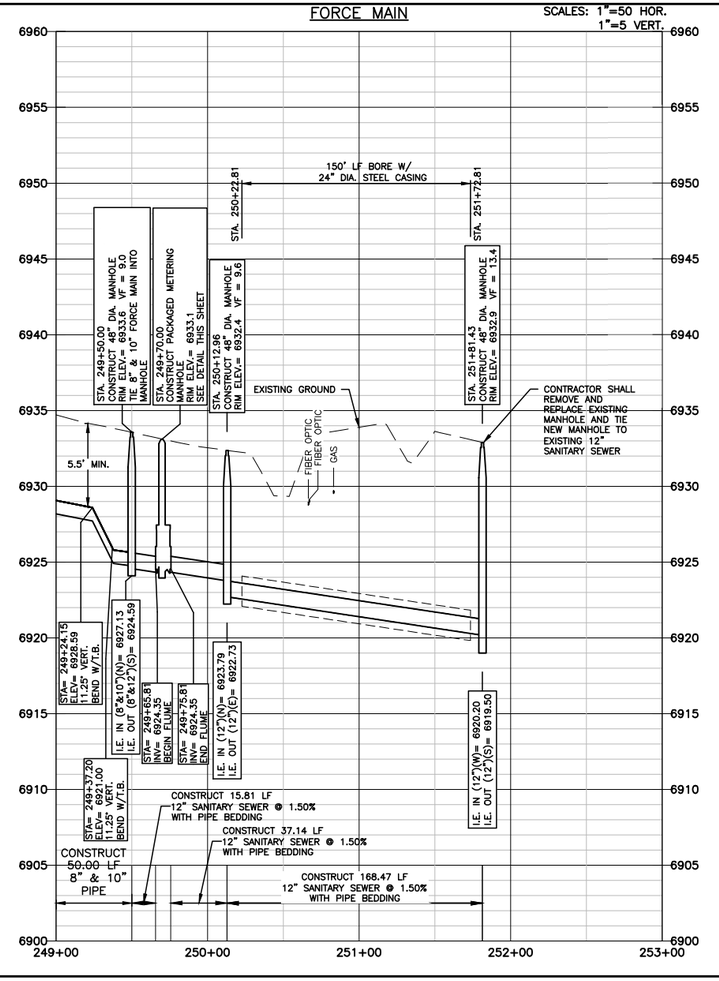
SECTION VIEW
N.T.S.

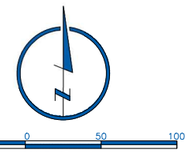


ADJUSTABLE SONIC MOUNTING BRACKET
TYPE 304 STAINLESS STEEL

PACKAGED METERING MANHOLE
3" X 9" PARSHALL FLUME
N.T.S.







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KEYNOTES:

(1) SEDIMENT CONTROL LOG PER DETAIL SHEET FM2.4

(2) CONTRACTOR SHALL SAW CUT, REMOVE & REPLACE EXISTING PAVEMENT PER EL PASO COUNTY SPECIFICATIONS.

(3) VEHICLE TRACKING CONTROL PER SHEET FM2.4

DRAWN BY: JPM
DESIGNED BY: JPM
DATE: APRIL 24, 2017
JOB NUMBER-TASK#: 0416011
BOOK AND PAGE:
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LRA-Inc.com / 1224Water.com

STERLING RANCH LIFT STATION AND FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

FORCE MAIN PLAN & PROFILE
STA. 249+00 TO STA. 251+83.43
AND
PACKAGED METERING MANHOLE

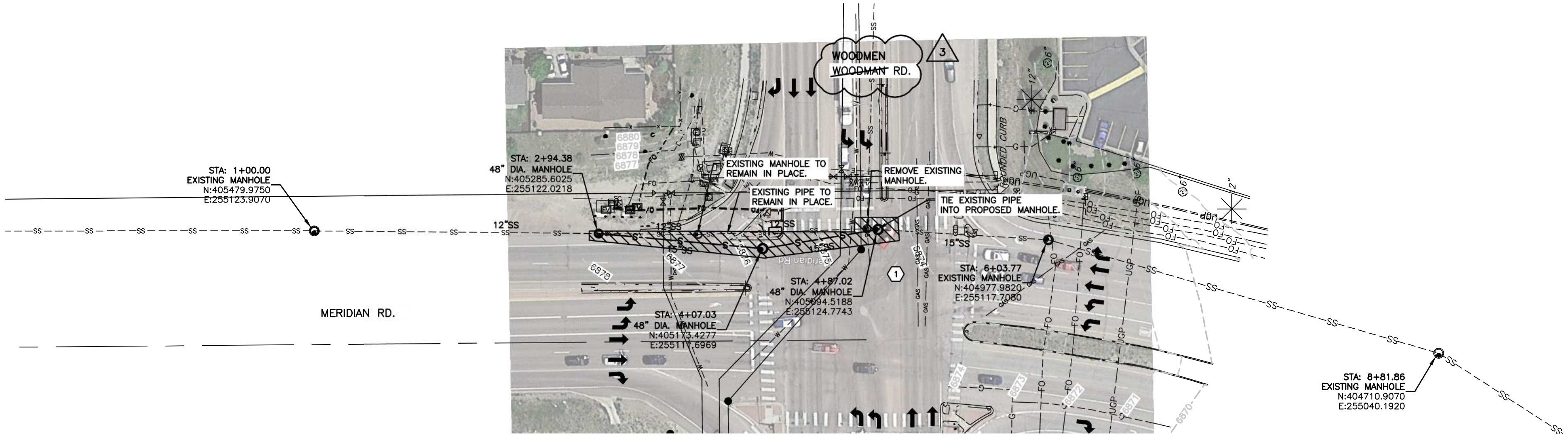
LAMP RYNEARSON - ENGINEERS

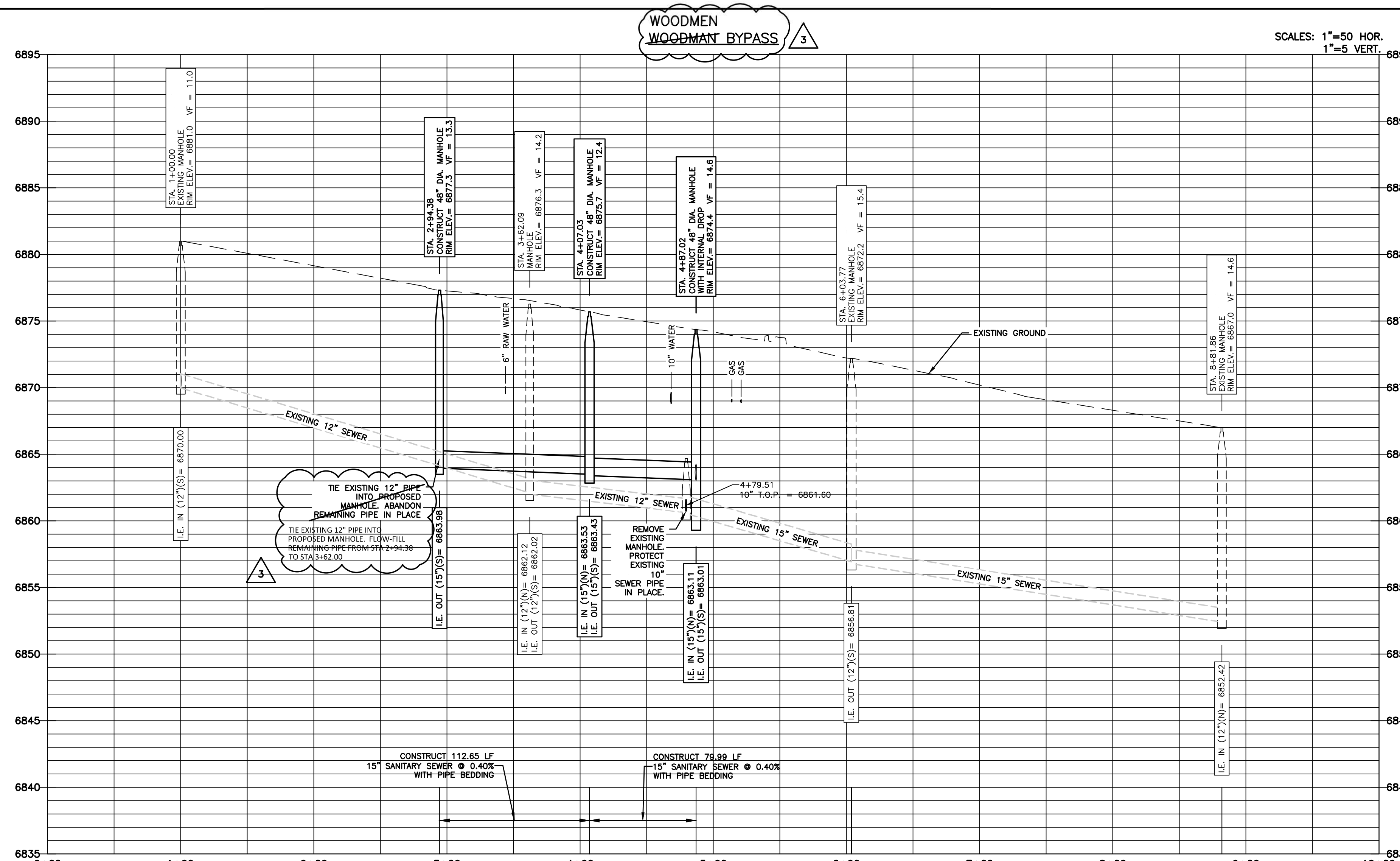
BRADLEY A. SIMONS
34705

SHEET
FM1.25

COLORADO 811
KNOW WHAT'S BELOW. CALL BEFORE YOU DIG.

P:_Engineering\0416011 Sterling Ranch Lift Station\DRAWINGS\CONSTRUCTION DRAWINGS\0416011-SAN-002.dwg, 4/21/2017 2:57:07 PM, JASON MCNELL, LAMP RYNEARSON & ASSOCIATES





SCALE: 1"= 50'

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DRAWN BY JPM
DESIGNED BY JPM
DATE APRIL 24, 2017
JOB NUMBER-TASKS 0416011
BOOK AND PAGE

REVISIONS
3 – PER EPC COMMENTS – 05/31/2019

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STERLING RANCH LIFT STATION AND FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

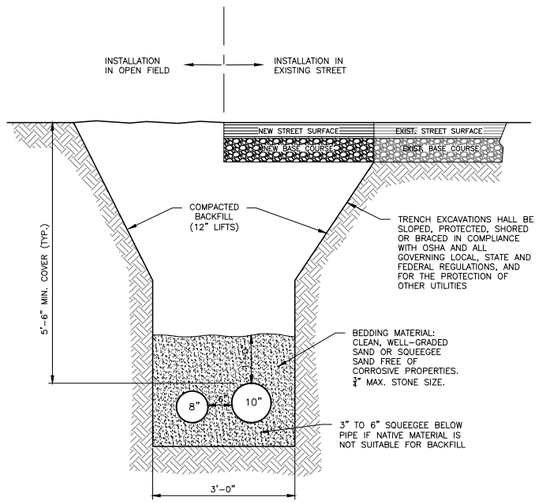
SANITARY SEWER PLAN & PROFILE
WOODMAN BYPASS

LAMP RYNEARSON - ENGINEERS

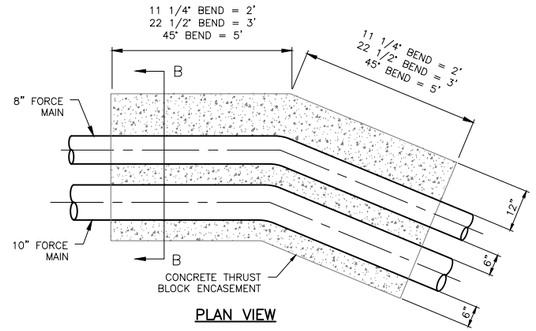
PRELIMINARY

BRADLEY A. SIMONS
34705

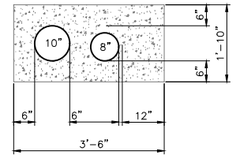
SHEET
FM1.26



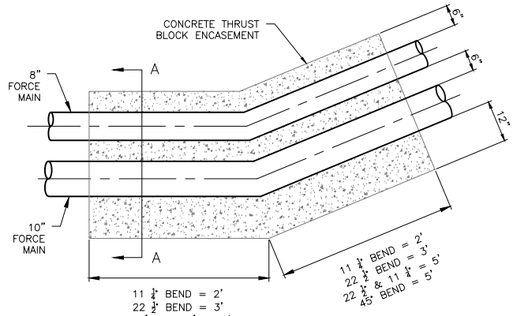
TYPICAL TRENCH SECTION
N.T.S



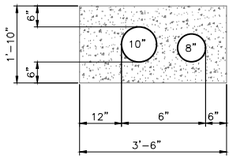
PLAN VIEW



SECTION B–B

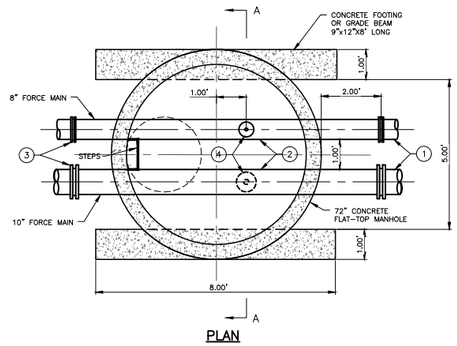


PLAN VIEW

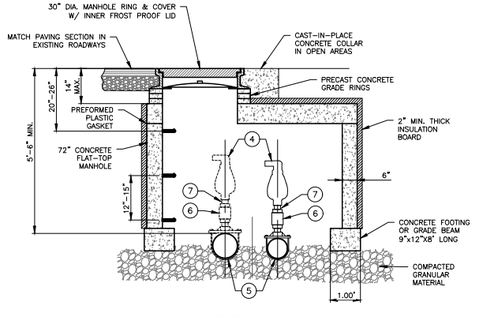


SECTION A–A

HORIZONTAL THRUST BLOCK DETAIL
N.T.S



PLAN



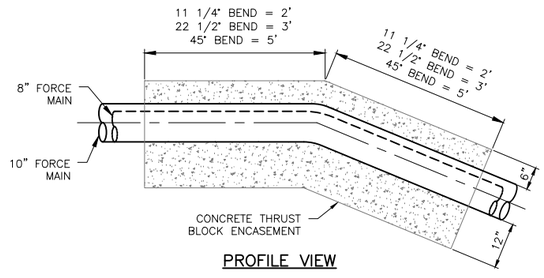
SECTION A–A

ITEM	8" FORCE MAIN	10" FORCE MAIN
1	8" HDPE	10" HDPE
2	8" DIP	10" DIP
3	HDPE x DIP COUPLING	HDPE x DIP COUPLING
4	2" COMBINATION AIR VALVE	SEE NOTE 1
5	2" TAPPING SADDLE	SEE NOTE 1
6	2" STAINLESS STEEL THREADED BALL VALVE	SEE NOTE 1
7	2" THREADED NIPPLE	SEE NOTE 1

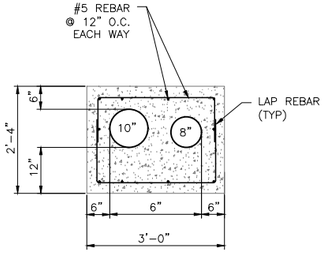
NOTES:

1. **THE FUTURE COMBINATION AIR VALVE AND APPURTENANCES ASSOCIATED WITH THE 10" FORCEMAIN SHALL BE SIZED AND INSTALLED PRIOR TO THE USE OF THE 10" FORCE MAIN.**

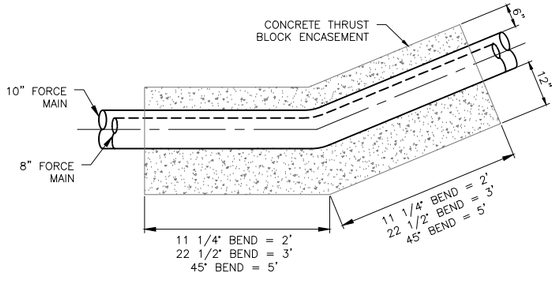
AIR RELEASE MANHOLE
N.T.S.



PROFILE VIEW



SECTION



PROFILE VIEW

VERTICAL THRUST BLOCK DETAIL
N.T.S

DRAWN BY	SAS
DESIGNED BY	SAS
DATE	APRIL 24, 2017
JOB NUMBER-TASK8	0416011
BOOK AND PAGE	

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STERLING RANCH LIFT STATION AND FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

FORCE MAIN
CONSTRUCTION DETAILS

LAMP RYNEARSON - ENGINEERS

BRADLEY A. SIMONS
34705

SHEET
FM2.1

FIELD INSTALLATION OF POLYETHYLENE TUBING FOR DIP PIPE AND FITTINGS

STEP 1:

PLACE TUBE OF POLYETHYLENE MATERIAL ON PIPE PRIOR TO LOWERING IT INTO TRENCH.

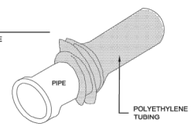
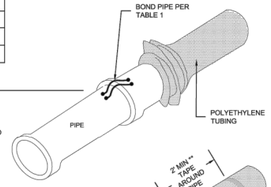


TABLE 1
SUITABLE CONDUCTOR SIZES FOR JOINT BONDING OF DUCTILE IRON PIPE

PIPE SIZE (IN)	QUANTITY - SIZE OF BOND	SIZE OF CHARGE (G)
8 TO 14	2 - #8 STRANDED OR SOLID	25
16 TO 36	2 - #4 STRANDED OR SOLID	32
	4 - #8 STRANDED OR SOLID	25
	1 - BONDING STRAP	15
42 TO 64	2 - #2 STRANDED OR SOLID	32
	4 - #4 STRANDED OR SOLID	32

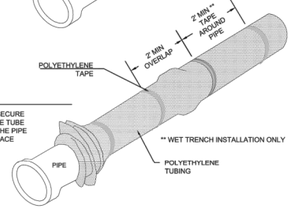
STEP 2:

INSTALL BONDING STRAP OR WIRE AT EVERY JOINT OF PIPE PRIOR TO WRAPPING. PULL TUBE OVER THE LENGTH OF THE PIPE. TAPE TUBE TO END AT JOINT. FOLD MATERIAL AROUND THE ADJACENT SPIGOT END AND WRAP WITH TAPE TO HOLD THE PLASTIC TUBE IN PLACE.



STEP 3:

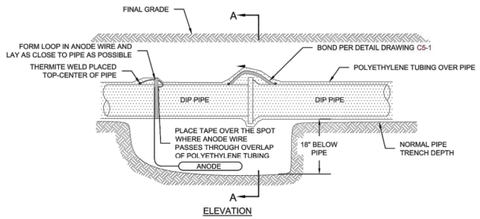
OVERLAP FIRST TUBE WITH ADJACENT TUBE AND SECURE WITH PLASTIC ADHESIVE TAPE. THE POLYETHYLENE TUBE MATERIAL SHALL BE NEATLY DRAWN UP AROUND THE PIPE BARREL FOLDED ON TOP OF PIPE AND TAPED IN PLACE

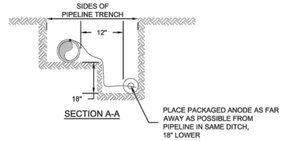


NOTES:

1. ANY TEARS OR HOLES SHALL BE REPAIRED WITH POLYETHYLENE TUBING AND TAPE.
2. WHEN WORKING AROUND EXISTING POLY WRAPPED PIPE, ANY TEARS AS A RESULT OF CONSTRUCTION SHALL BE REPAIRED.
3. WHEN WORKING AROUND EXISTING BONDED PIPE, ANY BROKEN BONDS AS A RESULT OF CONSTRUCTION, SHALL BE REPAIRED.

Colorado Springs Utilities — it's how we're all connected | POLYETHYLENE TUBING | C5-1 | DATED 5/2015

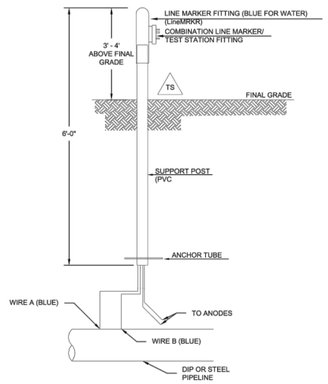




NOTES:

1. THERMITE WELD ANODE TO PIPE WITH A 15 GRAM CHARGE. INSTALL A COPPER SLEEVE WHEN WIRE IS #10 AWG OR SMALLER.
2. THERMITE WELD CONNECTIONS AND ANY BARE METAL SHALL BE COVERED WITH PRIMERLESS HANDICAP OR CORROSION TAPE.
3. PACKED ANODE SHOULD BE COVERED WITH FINE SOIL CONTAINING NO ROCKS OR DIRT CLUMPS AND SHALL BE HAND TAMPED TO THE BOTTOM OF THE PIPE FOR COMPACTION.
4. ANODE WITH BROKEN BAGS SHALL NOT BE USED.
5. ANODES SHALL BE REMOVED FROM PLASTIC PACKAGING.
6. IT IS NOT NECESSARY TO WET THE ANODES.
7. DIP PIPE SHALL BE ENCASED IN POLYETHYLENE TUBING PER DETAIL DRAWING C5-1.

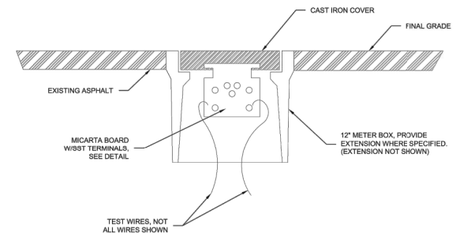
Colorado Springs Utilities — it's how we're all connected | BONDING JOINT AND ANODE INSTALLATION | C5-2 | DATED 5/2015



NOTES:

1. THE CONTRACTOR SHALL COORDINATE WITH COLORADO SPRINGS UTILITIES TO WIRE TERMINAL BOARD.
2. THERMITE WELD WIRES TO PIPE WITH A 15 GRAM CHARGE. INSTALL A COPPER SLEEVE WHEN WIRE IS #10 AWG OR SMALLER.
3. THERMITE WELD CONNECTIONS AND ANY BARE METAL SHALL BE COVERED WITH PRIMERLESS HANDICAP OR CORROSION TAPE.
4. THE CONTRACTOR SHALL VERIFY CONTINUITY OF ALL WIRES TO TERMINAL BOARD PRIOR TO FINAL ACCEPTANCE.
5. COLOR CODE WIRE INSULATION AS SHOWN IN APPLICABLE TEST STATION DETAILS. CONNECT EACH TEST WIRE TO SEPARATE TERMINAL.
6. WIRE CONFIGURATION FOR FLUSH MOUNT STYLE TEST STATIONS SIMILAR TO POST MOUNT STYLE TEST STATIONS.
7. PROVIDE 18 INCHES SLACK IN TEST WIRES, MINIMUM.

Colorado Springs Utilities — it's how we're all connected | INSTALLATION OF POST MOUNT TEST STATION IN UNIMPROVED AREAS | A8-11 | DATED 06/2015

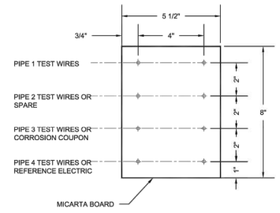


NOTES:

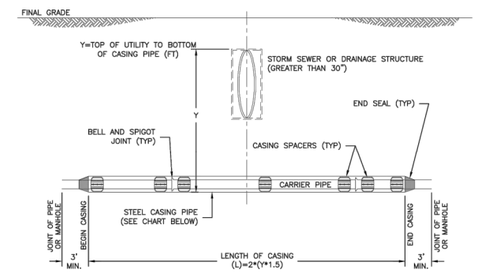
1. THE CONTRACTOR SHALL COORDINATE WITH COLORADO SPRINGS UTILITIES TO WIRE TERMINAL BOARD.
2. THERMITE WELD WIRES TO PIPE WITH A 15 GRAM CHARGE. INSTALL A COPPER SLEEVE WHEN WIRE IS #10 AWG OR SMALLER.
3. THERMITE WELD CONNECTIONS AND ANY BARE METAL SHALL BE COVERED WITH PRIMERLESS HANDICAP OR CORROSION TAPE.
4. THE CONTRACTOR SHALL VERIFY CONTINUITY OF ALL WIRES TO TERMINAL BOARD PRIOR TO FINAL ACCEPTANCE.
5. COLOR CODE WIRE INSULATION AS SHOWN IN APPLICABLE TEST STATION DETAILS. CONNECT EACH TEST WIRE TO SEPARATE TERMINAL.
6. WIRE CONFIGURATION FOR FLUSH MOUNT STYLE TEST STATIONS SIMILAR TO POST MOUNT STYLE TEST STATIONS.
7. PROVIDE 18 INCHES SLACK IN TEST WIRES, MINIMUM.

NOTES:

1. TERMINALS SHALL BE 1/4" STAINLESS STEEL WILOCKING WASHER, TWO FLAT WASHERS, AND DOUBLE NUTS.
2. ALL WIRE CONNECTIONS TO BE WIRING TONGUE COMPRESSION TERMINALS.
3. WIRES ON TEST STATIONS TO BE PERMANENTLY LABELED WITH PIPE IDENTIFICATION (i.e. 12" DIP) USING NYLON WIRE MARKER TAGS.



Colorado Springs Utilities — it's how we're all connected | TEST STATION FLUSH MOUNT | A8-9 | DATED 03/2014

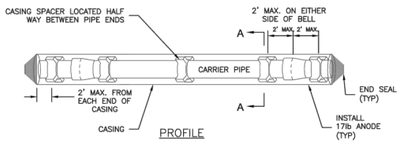


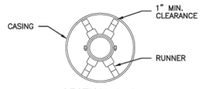
CARRIER PIPE SIZE (INCH)	MIN. CASING PIPE SIZE (INCH)	MIN. CASING WALL THICKNESS (INCH)
8	12	0.250
12	16	0.312
18	22	0.375
20 & 21	24	0.500
24	30	0.500
30	36	0.625
36	42	0.625

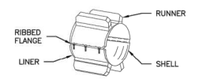
NOTES:

1. THE DESIGN ENGINEER SHALL VERIFY THAT THE SIZE OF THE CASING PIPE WILL MEET THE NEEDS OF THE PROJECT.
2. CASING WALL THICKNESS BASED ON E80 LOADING.
3. CASING SHALL BE STEEL PIPE WITH A MINIMUM YIELD STRENGTH OF 35,000 PSI.
4. SEE DETAIL DRAWING C2-5 FOR CASING SPACER DETAILS.
5. WHERE THE WASTEWATER MAIN CROSSES ABOVE A WATER MAIN, SEE SECTION 2.5.F.3.
6. WHERE THE WASTEWATER MAIN CROSSES UNDER A RAILWAY OR MAJOR ROADWAY, THE LENGTH OF CASING AND ITS PROPERTIES SHALL BE DETERMINED BY THE AUTHORITY HAVING JURISDICTION.

Colorado Springs Utilities — it's how we're all connected | TYPICAL STEEL CASING INSTALLATION | C2-4 | DATED 5/2015







CARRIER PIPE:

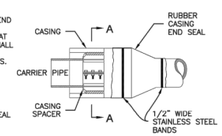
1. CARRIER PIPE SHALL BE CENTERED WITHIN CASING BY USE OF APPROVED CASING SPACERS. (SEE CHAPTER 4)

PLACEMENT OF SPACERS ON CARRIER PIPE:

1. CASING SPACERS SHALL BE PLACED MAX. 2' FROM EACH END OF CASING AND ON EITHER SIDE OF EACH BELL. WHEN CARRIER PIPE IS PVC, CASING SPACER SHALL BE PLACED AT THE HOME MARK TO PREVENT OVER-BELLING. SPACERS SHALL ALSO BE PLACED HALF WAY BETWEEN PIPE ENDS, OR IN ACCORDANCE WITH PIPE MANUFACTURERS RECOMMENDATIONS.

END SEALS:

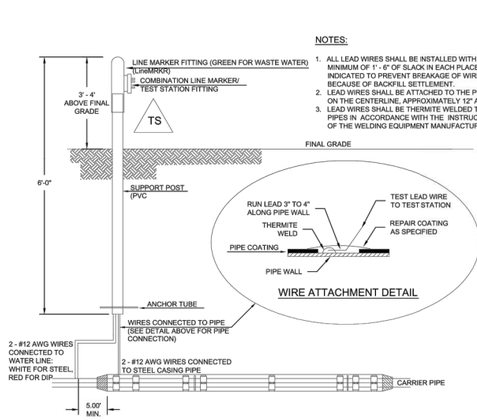
1. END SEALS SHALL BE USED TO ENSURE A WATER TIGHT SEAL ON EITHER END OF THE CASING.



CATHODIC PROTECTION:

1. CASING SHALL BE CATHODICALLY PROTECTED USING A 17 LB HIGH POTENTIAL ANODE AND AN APPROVED COATING. SEE SECTION 2.5.G.

Colorado Springs Utilities — it's how we're all connected | TYPICAL STEEL CASING INSTALLATION (CONTINUED) | C2-5 | DATED 5/2015



TYPICAL DETAIL FOR TEST STATION WITH STEEL SLEEVE INSTALLATION

NOTES:

1. ALL LEAD WIRES SHALL BE INSTALLED WITH A MINIMUM OF 1'-6" OF SLACK IN EACH PLACE INDICATED TO PREVENT BREAKAGE OF WIRE BECAUSE OF BACKFILL SETTLEMENT.
2. LEAD WIRES SHALL BE ATTACHED TO THE PIPE ON THE CENTERLINE, APPROXIMATELY 12" APART.
3. LEAD WIRES SHALL BE THERMITE WELDED TO PIPES IN ACCORDANCE WITH THE INSTRUCTIONS OF THE WELDING EQUIPMENT MANUFACTURER.

NOTES:

1. THE CASING SHALL BE CATHODICALLY PROTECTED UNDER THE DIRECTION OF THE COLORADO SPRINGS UTILITIES INSPECTOR. SEE SECTION 2.5.G.
2. EXAMPLE CAN VARY DUE TO SITE CONDITIONS AND COLORADO SPRINGS UTILITIES INSPECTORS' DIRECTION.
3. SEE STANDARD DETAIL DRAWING C2-4 - STEEL CASING INSTALLATION.
4. CONTRACTOR TO COORDINATE W/ COLORADO SPRINGS UTILITIES TO WIRE TERMINAL BOARD.
5. THERMITE WELD WIRES TO PIPE W/ 15 GRAM CHARGE. INSTALL COPPER SLEEVE WHEN WIRE IS #10 AWG OR SMALLER.
6. THERMITE WELD CONNECTIONS AND ANY BARE METAL SHALL BE COVERED WITH PRIMERLESS HANDICAP OR CORROSION TAPE.
7. CONTRACTOR TO VERIFY CONTINUITY OF ALL WIRES TO TERMINAL BOARD PRIOR TO FINAL ACCEPTANCE.

Colorado Springs Utilities — it's how we're all connected | INSTALLATION OF CATHODIC PROTECTION TEST STATION AT A CASING PIPE | C5-5 | DATED 5/2015

DRAWN BY: SAS
DESIGNED BY: SAS
DATE: APRIL 24, 2017
JOB NUMBER-TASK#: 0416011
BOOK AND PAGE:

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STERLING RANCH LIFT STATION AND FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

FORCE MAIN CONSTRUCTION DETAILS

LAMP RYNEARSON - ENGINEERS

BRADLEY A. SIMONS
34705

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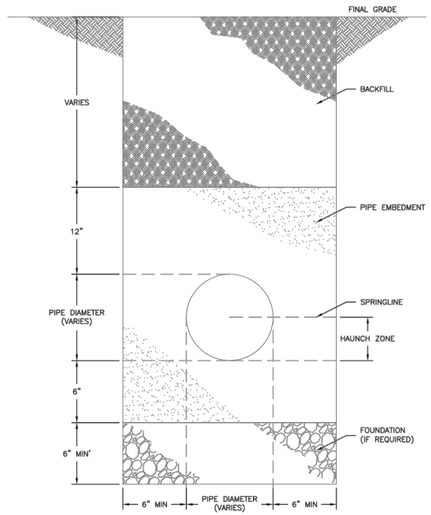
FM2.2

P:_Engineering\0416011 Sterling Ranch Lift Station\DRAWINGS\CONSTRUCTION DRAWINGS\0416011-DET.dwg, 4/21/2017 3:00:51 PM, JASON MCNELL, LAMP RYNEARSON & ASSOCIATES



NOTE:

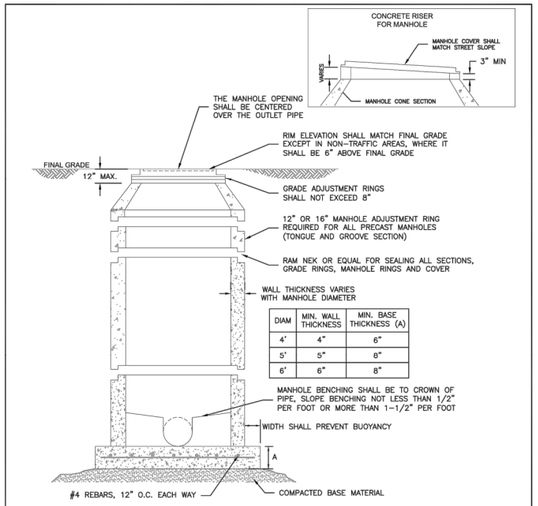
1. TRENCH BACKFILL SHALL CONFORM TO THE SPECIFICATIONS OF THE AUTHORITY HAVING JURISDICTION AND ASTM D2321.

Colorado Springs Utilities — it's how we're all connected

TYPICAL TRENCH SECTION

C2–1

DATED 5/2015



DIAM	MIN. WALL THICKNESS	MIN. BASE THICKNESS (A)
4'	4"	6"
5'	5"	8"
6'	6"	8"

NOTES:

1. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF NOT LESS THAN 4000 PSI @ 28 DAYS AND DESIGNED FOR HS–20 LOADING CONDITIONS.
2. ALL CONCRETE SHALL BE MECHANICALLY VIBRATED.
3. FOR CAST IN PLACE MANHOLES, DO NOT DROP CONCRETE A DISTANCE OF MORE THAN 5' UNLESS APPROVED BY COLORADO SPRINGS UTILITIES.
4. 3/4" CRUSHED ROCK REQUIRED UNDER BASE TO A DEPTH OF 6" UP TO SPRINGLINE OF PIPE, 2'–3' RADIUS AROUND BASE.
5. ALL STEPS SHALL BE REMOVED FOLLOWING CONSTRUCTION.
6. STRUCTURAL REINFORCEMENT SHALL COMPLY TO ASTM C–478. ASTM C–478 SHALL BE STAMPED ON THE OUTSIDE OF THE MANHOLE.

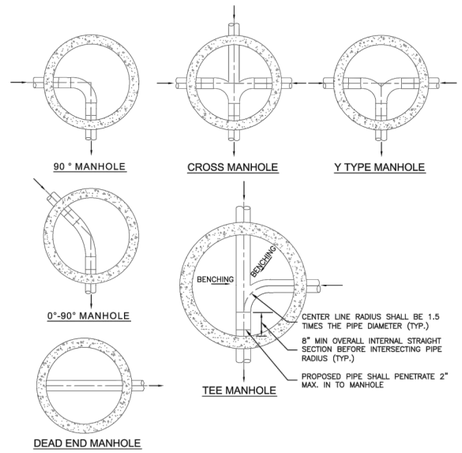
Colorado Springs Utilities — it's how we're all connected

STANDARD CONCRETE MANHOLE

C3–1

DATED 5/2015

TYPICAL INTERSECTING PIPE MANHOLE LAYOUTS



NOTES:

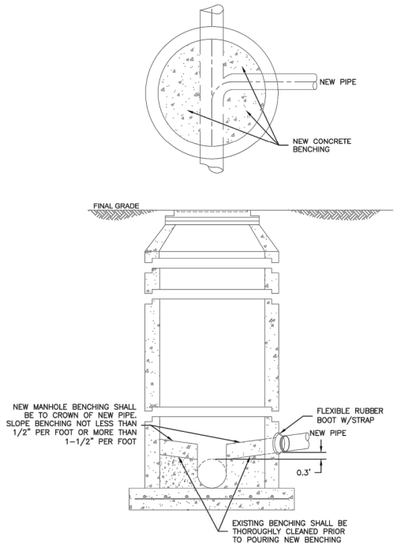
1. SEE DETAIL DRAWING C3–1 FOR MANHOLE REQUIREMENTS.
2. LAYOUTS SHOWN ARE FOR 8"–12" PIPES; LAYOUTS FOR LARGER DIAMETER PIPELINES AND MANHOLES SHALL BE DESIGNED BY THE DESIGN ENGINEER AND APPROVED BY COLORADO SPRINGS UTILITIES.
3. TO BE READ IN CONJUNCTION WITH CHAPTER 2, MANHOLE SIZES.

Colorado Springs Utilities — it's how we're all connected

TYPICAL MANHOLE LAYOUTS AND INTERSECTIONS

C3–2

DATED 5/2015



NOTES:

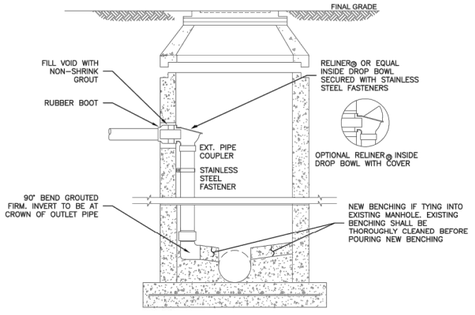
1. SEE DETAIL DRAWING C3–1 FOR MANHOLE REQUIREMENTS.

Colorado Springs Utilities — it's how we're all connected

CORE DRILLING INTO AN EXISTING MANHOLE

C3–3

DATED 5/2015



NOTES:

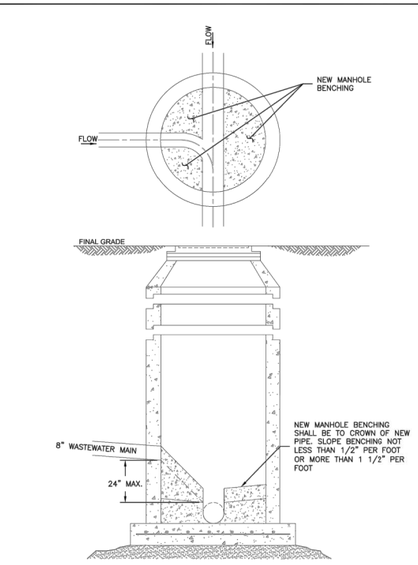
1. SEE DETAIL DRAWING C3–1 FOR MANHOLE REQUIREMENTS.
2. DROP MANHOLES ARE NOT ALLOWED ON 10" AND LARGER PIPELINES. DROP MANHOLES SHALL BE REVIEWED AND APPROVED ON A CASE BY CASE BASIS BY WASTEWATER PLANNING AND ENGINEERING STAFF.
3. ALL INTERIOR CONCRETE SURFACES SHALL BE EPOXY COATED.
4. MINIMUM SIZE FOR A DROP MANHOLE IS 5' DIAMETER MANHOLE.
5. MANHOLES WITH 8' OR LESS OF INTERNAL DROP SHALL HAVE ONE STRAP AT THE TOP AND ONE AT THE BOTTOM OF THE DROP SECTION.
6. 1/4" – 2" STRAPS TO BE ANCHORED WITH 1/2" GALVANIZED LUG BOLTS IN TO WALL (TYP).

Colorado Springs Utilities — it's how we're all connected

INTERNAL DROP MANHOLE WITH DROP GREATER THAN 24"

C3–6

DATED 5/2015



NOTES:

1. SEE DETAIL DRAWING C3–1 FOR MANHOLE REQUIREMENTS.

Colorado Springs Utilities — it's how we're all connected

DROP MANHOLE LESS THAN 24"

C3–7

DATED 5/2015

DRAWN BY: SAS
DESIGNED BY: SAS
DATE: APRIL 24, 2017
JOB NUMBER-TASK#: 0416011
BOOK AND PAGE:

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STERLING RANCH LIFT STATION AND FORCE MAIN
STERLING RANCH METROPOLITAN DISTRICT NO. 1

FORCE MAIN CONSTRUCTION DETAILS

LAMP RYNEARSON - ENGINEERS

BRADLEY A. SIMONS
34705

SHEET
FM2.3

Seeding dates for the highest success probability of perennial species along the Front Range are generally in the spring from April through early May and in the fall after the first of September until the ground freezes. If the area is irrigated, seeding may occur in summer months, as well. See Table TS/PS-3 for appropriate seeding dates.

Table TS/PS-1. Minimum Drill Seeding Rates for Various Temporary Annual Grasses

Species[a] (Common name)	Growth Season[b]	Pounds of Pure Live Seed (PLS)/acre[c]	Planting Depth (inches)
1. Oats	Cool	35 - 50	1 - 2
2. Spring wheat	Cool	25 - 35	1 - 2
3. Spring barley	Cool	25 - 35	1 - 2
4. Annual ryegrass	Cool	10 - 15	½
5. Millet	Warm	3 - 15	½ - ¾
6. Sudangrass	Warm	5–10	½ - ¾
7. Sorghum	Warm	5–10	½ - ¾
8. Winter wheat	Cool	20–35	1 - 2
9. Winter barley	Cool	20–35	1 - 2
10. Winter rye	Cool	20–35	1 - 2
11. Triticale	Cool	25–40	1 - 2

[a] Successful seeding of annual grass resulting in adequate plant growth will usually produce enough dead-plant residue to provide protection from wind and water erosion for an additional year. This assumes that the cover is not disturbed or mowed closer than 8 inches.

Hydraulic seeding may be substituted for drilling only where slopes are steeper than 3:1 or where access limitations exist. When hydraulic seeding is used, hydraulic mulching should be applied as a separate operation, when practical, to prevent the seeds from being encapsulated in the mulch.

[b] See Table TS/PS-3 for seeding dates. Irrigation, if consistently applied, may extend the use of cool season species during the summer months.

[c] Seeding rates should be doubled if seed is broadcast, or increased by 50 percent if done using a Brillion Drill or by hydraulic seeding.

Table TS/PS-2. Minimum Drill Seeding Rates for Perennial Grasses

Common[a] Name	Botanical Name	Growth Season[b]	Growth Form	Seeds/ Pound	Pounds of PLS/acre
Alakali Soil Seed Mix					
Alkali sacaton	*Sporobolus airoides*	Cool	Bunch	1,750,000	0.25
Basin wildrye	*Elymus cinereus*	Cool	Bunch	165,000	2.5
Sodar streambank wheatgrass	*Agropyron riparium 'Sodar'*	Cool	Sod	170,000	2.5
Jose tall wheatgrass	*Agropyron elongatum 'Jose'*	Cool	Bunch	79,000	7.0
Arriba western wheatgrass	*Agropyron smithii 'Arriba'*	Cool	Sod	110,000	5.5
Total					**17.75**
Fertile Loamy Soil Seed Mix					
Ephriam crested wheatgrass	*Agropyron cristatum 'Ephriam'*	Cool	Sod	175,000	2.0
Dural hard fescue	*Festuca ovina 'duriuscula'*	Cool	Bunch	565,000	1.0
Lincoln smooth brome	*Bromus inermis leyss 'Lincoln'*	Cool	Sod	130,000	3.0
Sodar streambank wheatgrass	*Agropyron riparium 'Sodar'*	Cool	Sod	170,000	2.5
Arriba western wheatgrass	*Agropyron smithii 'Arriba'*	Cool	Sod	110,000	7.0
Total					**15.5**
High Water Table Soil Seed Mix					
Meadow foxtail	*Alopecurus pratensis*	Cool	Sod	900,000	0.5
Redtop	*Agrostis alba*	Warm	Open sod	5,000,000	0.25
Reed canarygrass	*Phalaris arundinacea*	Cool	Sod	68,000	0.5
Lincoln smooth brome	*Bromus inermis leyss 'Lincoln'*	Cool	Sod	130,000	3.0
Pathfinder switchgrass	*Panicum virgatum 'Pathfinder'*	Warm	Sod	389,000	1.0
Alkar tall wheatgrass	*Agropyron elongatum 'Alkar'*	Cool	Bunch	79,000	5.5
Total					**10.75**
Transition Turf Seed Mix[c]					
Ruebens Canadian bluegrass	*Poa compressa 'Ruebens'*	Cool	Sod	2,500,000	0.5
Dural hard fescue	*Festuca ovina 'duriuscula'*	Cool	Bunch	565,000	1.0
Citation perennial ryegrass	*Lolium perenne 'Citation'*	Cool	Sod	247,000	3.0
Lincoln smooth brome	*Bromus inermis leyss 'Lincoln'*	Cool	Sod	130,000	3.0
Total					**7.5**

Table TS/PS-2. Minimum Drill Seeding Rates for Perennial Grasses (cont.)

Common Name	Botanical Name	Growth Season[b]	Growth Form	Seeds/ Pound	Pounds of PLS/acre
Sandy Soil Seed Mix					
Blue grama	*Bouteloua gracilis*	Warm	Sod-forming bunchgrass	825,000	0.5
Camper little bluestem	*Schizachyrium scoparium 'Camper'*	Warm	Bunch	240,000	1.0
Prairie sandreed	*Calamovilfa longifolia*	Warm	Open sod	274,000	1.0
Sand dropseed	*Sporobolus cryptandrus*	Cool	Bunch	5,298,000	0.25
Vaughn sideoats grama	*Bouteloua curtipendula 'Vaughn'*	Warm	Sod	191,000	2.0
Arriba western wheatgrass	*Agropyron smithii 'Arriba'*	Cool	Sod	110,000	5.5
Total					**10.25**
Heavy Clay, Rocky Foothill Seed Mix					
Ephriam crested wheatgrass[d]	*Agropyron cristatum 'Ephriam'*	Cool	Sod	175,000	1.5
Oahe Intermediate wheatgrass	*Agropyron intermedium 'Oahe'*	Cool	Sod	115,000	5.5
Vaughn sideoats grama[e]	*Bouteloua curtipendula 'Vaughn'*	Warm	Sod	191,000	2.0
Lincoln smooth brome	*Bromus inermis leyss 'Lincoln'*	Cool	Sod	130,000	3.0
Arriba western wheatgrass	*Agropyron smithii 'Arriba'*	Cool	Sod	110,000	5.5
Total					**17.5**

[a] All of the above seeding mixes and rates are based on drill seeding followed by crimped straw mulch. These rates should be doubled if seed is broadcast and should be increased by 50 percent if the seeding is done using a Brillion Drill or is applied through hydraulic seeding. Hydraulic seeding may be substituted for drilling only where slopes are steeper than 3:1. If hydraulic seeding is used, hydraulic mulching should be done as a separate operation.

[b] See Table TS/PS-3 for seeding dates.

[c] If site is to be irrigated, the transition turf seed rates should be doubled.

[d] Crested wheatgrass should not be used on slopes steeper than 6H to 1V.

[e] Can substitute 0.5 lbs PLS of blue grama for the 2.0 lbs PLS of Vaughn sideoats grama.

Table TS/PS-3. Seeding Dates for Annual and Perennial Grasses

	Annual Grasses (Numbers in table reference species in Table TS/PS-1)		Perennial Grasses	
Seeding Dates	**Warm**	**Cool**	**Warm**	**Cool**
January 1–March 15			✓	✓
March 16–April 30	4	1,2,3	✓	✓
May 1–May 15	4		✓	
May 16–June 30	4,5,6,7			
July 1–July 15	5,6,7			
July 16–August 31				
September 1–September 30		8,9,10,11		
October 1–December 31			✓	✓

Mulch

Cover seeded areas with mulch or an appropriate rolled erosion control product to promote establishment of vegetation. Anchor mulch by crimping, netting or use of a non-toxic tackifier. See the Mulching BMP Fact Sheet for additional guidance.

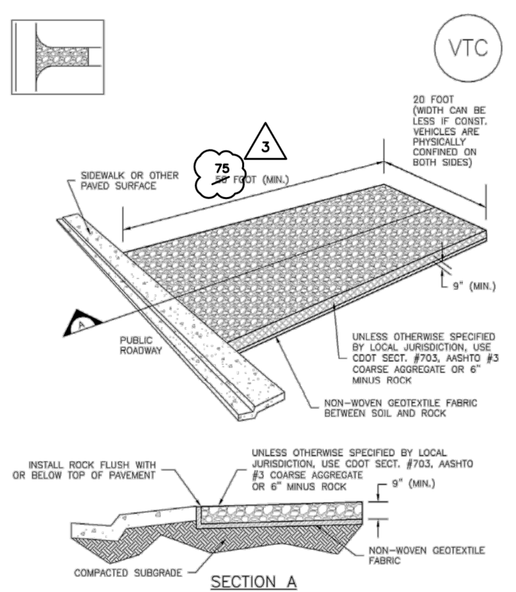
Maintenance and Removal

Monitor and observe seeded areas to identify areas of poor growth or areas that fail to germinate. Reseed and mulch these areas, as needed.

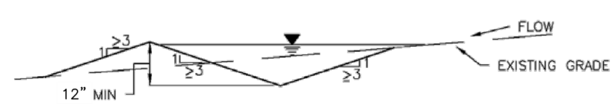
An area that has been permanently seeded should have a good stand of vegetation within one growing season if irrigated and within three growing seasons without irrigation in Colorado. Reseed portions of the site that fail to germinate or remain bare after the first growing season.

Seeded areas may require irrigation, particularly during extended dry periods. Targeted weed control may also be necessary.

Protect seeded areas from construction equipment and vehicle access.



VTC-1. AGGREGATE VEHICLE TRACKING CONTROL



EARTH DIKE AND DRAINAGE SWALE INSTALLATION NOTES

1. SEE SITE PLAN FOR:
   - LOCATION OF DIVERSION SWALE
   - TYPE OF SWALE (UNLINED, COMPACTED AND/OR LINED).
   - LENGTH OF EACH SWALE.
   - DEPTH, D, AND WIDTH, W DIMENSIONS.
   - FOR ECB/TRM LINED DITCH, SEE ECB DETAIL.
   - FOR RIPRAP LINED DITCH, SIZE OF RIPRAP, D50.
2. SEE DRAINAGE PLANS FOR DETAILS OF PERMANENT CONVEYANCE FACILITIES AND/OR DIVERSION SWALES EXCEEDING 2-YEAR FLOW RATE OR 10 CFS.
3. EARTH DIKES AND SWALES INDICATED ON SWMP PLAN SHALL BE INSTALLED PRIOR TO LAND-DISTURBING ACTIVITIES IN PROXIMITY.
4. EMBANKMENT IS TO BE COMPACTED TO 90% OF MAXIMUM DENSITY AND WITHIN 2% OF OPTIMUM MOISTURE CONTENT ACCORDING TO ASTM D698.
5. SWALES ARE TO DRAIN TO A SEDIMENT CONTROL BMP.
6. FOR LINED DITCHES, INSTALLATION OF ECB/TRM SHALL CONFORM TO THE REQUIREMENTS OF THE ECB DETAIL.
7. WHEN CONSTRUCTION TRAFFIC MUST CROSS A DIVERSION SWALE, INSTALL A TEMPORARY CULVERT WITH A MINIMUM DIAMETER OF 12 INCHES.

EARTH DIKE AND DRAINAGE SWALE MAINTENANCE NOTES

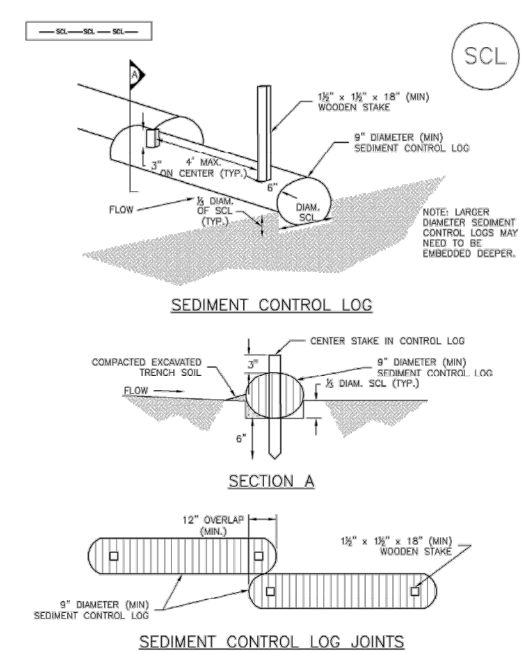
1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.
2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.
4. SWALES SHALL REMAIN IN PLACE UNTIL THE END OF CONSTRUCTION; IF APPROVED BY LOCAL JURISDICTION, SWALES MAY BE LEFT IN PLACE.
5. WHEN A SWALE IS REMOVED, THE DISTURBED AREA SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY LOCAL JURISDICTION.

(DETAIL ADAPTED FROM DOUGLAS COUNTY, COLORADO AND THE CITY OF COLORADO SPRINGS, COLORADO, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

GRADED BERM

N.T.S



SCL-1. SEDIMENT CONTROL LOG

SEDIMENT CONTROL LOG INSTALLATION NOTES

1. SEE PLAN VIEW FOR LOCATION AND LENGTH OF SEDIMENT CONTROL LOGS.
2. SEDIMENT CONTROL LOGS THAT ACT AS A PERIMETER CONTROL SHALL BE INSTALLED PRIOR TO ANY UPGRADIENT LAND-DISTURBING ACTIVITIES.
3. SEDIMENT CONTROL LOGS SHALL CONSIST OF STRAW, COMPOST, EXCELSIOR OR COCONUT FIBER, AND SHALL BE FREE OF ANY NOXIOUS WEED SEEDS OR DEFECTS INCLUDING RIPS, HOLES AND OBVIOUS WEAR.
4. SEDIMENT CONTROL LOGS MAY BE USED AS SMALL CHECK DAMS IN DITCHES AND SWALES. HOWEVER, THEY SHOULD NOT BE USED IN PERENNIAL STREAMS OR HIGH VELOCITY DRAINAGE WAYS.
5. IT IS RECOMMENDED THAT SEDIMENT CONTROL LOGS BE TRENCHED INTO THE GROUND TO A DEPTH OF APPROXIMATELY ⅓ OF THE DIAMETER OF THE LOG. IF TRENCHING TO THIS DEPTH IS NOT FEASIBLE AND/OR DESIRABLE (SHORT TERM INSTALLATION WITH DESIRE NOT TO DAMAGE LANDSCAPE) A LESSER TRENCHING DEPTH MAY BE ACCEPTABLE WITH MORE ROBUST STAKING
6. THE UPHILL SIDE OF THE SEDIMENT CONTROL LOG SHALL BE BACKFILLED WITH SOIL THAT IS FREE OF ROCKS AND DEBRIS. THE SOIL SHALL BE TIGHTLY COMPACTED INTO THE SHAPE OF A RIGHT TRIANGLE USING A SHOVEL OR WEIGHTED LAWN ROLLER.
7. FOLLOW MANUFACTURERS' GUIDANCE FOR STAKING. IF MANUFACTURERS' INSTRUCTIONS DO NOT SPECIFY SPACING, STAKES SHALL BE PLACED ON 4' CENTERS AND EMBEDDED A MINIMUM OF 6" INTO THE GROUND. 3" OF THE STAKE SHALL PROTRUDE FROM THE TOP OF THE LOG. STAKES THAT ARE BROKEN PRIOR TO INSTALLATION SHALL BE REPLACED.

SEDIMENT CONTROL LOG MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.
2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.
4. SEDIMENT ACCUMULATED UPSTREAM OF SEDIMENT CONTROL LOG SHALL BE REMOVED AS NEEDED TO MAINTAIN FUNCTIONALITY OF THE BMP, TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY ½ OF THE HEIGHT OF THE SEDIMENT CONTROL LOG.
5. SEDIMENT CONTROL LOG SHALL BE REMOVED AT THE END OF CONSTRUCTION. IF DISTURBED AREAS EXIST AFTER REMOVAL, THEY SHALL BE COVERED WITH TOP SOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

(DETAILS ADAPTED FROM TOWN OF PARKER, COLORADO, JEFFERSON COUNTY, COLORADO, DOUGLAS COUNTY, COLORADO, AND CITY OF AURORA, COLORADO, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

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FORCE MAIN
EROSION CONTROL DETAILS

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