Stormwater Management Plan

For Construction Activities At:

Lake Pump Station No .2 and Transmission Pipeline
1592 Lake Woodmoor Dr (Closest Property)
Monument, CO 80132

SWMP Prepared For:

Stanek Constructors, Inc
Sherri Leonard
651 Corporate Circle Ste 108
Golden, CO 80401
419-566-4130
sleonard@stanekconstuctors.com

SWMP Prepared By:

Stanek Constructors, Inc
Joe Giron
651 Corporate Circle Ste 108
Golden, CO 80401
303-746-3710
jgiron@stanekconstuctors.com

SWMP Preparation Date:

04/21/2021

Estimated Project Dates:

Project Start Date: 05/17/2021

Project Completion Date: 05/13/2022

Add text:
PCD Filing No.:
PPR-21-019

Item 1. Add Qualified Stormwater Manager and Contractor Information to cover/title sheet. If unknown, add a placeholder to be updated prior to the pre-construction meeting:

QUALIFIED STORMWATER MANAGER
Name: _____
Company: _____
Address: _____

CONTRACTOR
Name: _____
Company: _____
Address: _____

Contents

SECTION 1: CONTACT INFORMATION/RESPONSIBLE PARTIES

1.1 Owner(s) / Operator(s) / Subcontractor(s)

Owner(s):

Woodmoor Water and Sanitation District No. 1
Jessie Shaffer
1845 Woodmoor Drive
PO Box 1407
Monument, CO 80132
719-488-2525
jessies@woodmoorwater.com
Owner

Operator(s):

Stanek Constructors, Inc.
Chris Miller
651 Corporate Circle, Ste 108
Golden, CO 80401
Chris 218-866-0371
General Contractor

Subcontractor(s):

Colorado Civil Construction, Inc.
PO Box 207
Peyton, CO 80831
303-817-0130
Mike Peterson

CDI Environmental Contractors
5585 West Airport Rd.
Sedalia, CO 80135
303-241-1853
Jamie Salisbury

Emergency 24-Hour Contact:

Stanek Constructors, Inc.
Chris Miller
218-866-0371

1.2 Stormwater Team

Stormwater Team		
Name and/or position, and contact	Responsibilities	I Have Read the CGP and Understand the Applicable Requirements
Chris Miller Superintendent 218-866-0371 cmiller@stanekconstructors.com	Qualified Stormwater Manager	☒ Yes Date: 4/20/2021

SECTION 2: SITE EVALUATION, ASSESSMENT, AND PLANNING

2.1 Project/Site Information

Project Name and Address

Project/Site Name: Lake Pump Station No. 2 and Transmission Pipeline
Project Street/Location: 1592 Lake Woodmoor Dr. (Closest Property)
City: Monument
State: CO
ZIP Code: 80132
Business days and hours for the project: 7-5 M-F

Project Latitude/Longitude

Latitude: 39.097964° N (decimal degrees)

Longitude: -104.856599 ° W (decimal degrees)

Latitude/longitude data source:

☒ Map ☐ GPS ☐ Other (please specify): _____

CDPS Stormwater Permit

The CDPS stormwater general permit is attached to this SWMP.

Site Information

The existing project site ground surface surrounding the proposed Lake pump Station is a sandy beach area that slopes to the north east into Lake Woodmoor. To the south is grass and topsoil with a dirt access road into the work area. The Pipeline beginning at the pump station moves to the south west and turns west onto Lake Woodmoor Dr. for approximately 240'. The pipe then turns west and moves around Lake Woodmoor for approximately 520'. This area is grass and topsoil. The pipeline then turns north for approximately 1252'. This area is grass and topsoil. The pipeline then turns south west and runs into Willow Park Way for approximately 160'. This area moves through a dirt path and then ties into an existing water transmission line located in Willow Park way. The new pipeline will then connect to the existing pipeline at the intersection of Woodmoor Dr. and Willow Park Way at the NW corner of the intersection. The pipeline then heads north east on the shoulder Woodmoor Dr. for approximately 1738' to Deer Creek Rd. The

Item 8. Discuss soil erosion potential and impacts on discharge

Show page #'s so Table of Contents can be used.

Item 9. Describe condition of existing vegetation and include method used to determine ground cover (i.e., visual, aerial inspection)

Item 16. state whether there are or are not stream crossings located within the project are.

pipeline runs through a grass and topsoil shoulder and crosses 3 asphalt parking lot entrances. The pipeline then turns west onto Deer Creek Rd. and runs along the grass and topsoil shoulder for approximately 377' where the pipeline connects to the existing RW supply to the Central Water Treatment Plant.

2.2 Discharge Information

Does your project/site discharge stormwater into a Municipal Separate Storm Sewer System (MS4)? ☐ Yes ☒ No

Are there any waters of the U.S. within 50 feet of your project's earth disturbances? ☒ Yes ☐ No

2.3 Nature of the Construction Activities

General Description of Project

The project consists of the construction of a new pump station on the south east side of Lake Woodmoor, that requires earth disturbance for a new pump station wet well structure, lake intake pipes, and approximately 5263' of a new 12" transmission pipeline to the Central Water Treatment Plant.

Portions of the 7.82-acre site will be graded and shaped along with revised gravel driveway and revised drainage sloping. The main disturbance will be excavation and backfill while installing the new pump station with an underground intake structure and the installation of a new raw water pipeline to the existing Central Water Treatment Plant. While all work will be contained by sediment control logs on the downslope side of the work areas, excavations should be stabilized and monitored to prevent soil erosion during a moisture event. Once final grade is achieved, seeding and restoral as detailed in the attached Seeding Specification should take place. See Drawings C1.0 and C1.1 for the Site Layout Plan showing areas of gravel pavement, final grading, and riprap installation. See also Drawings C2.0 through C2.5 for pipeline installation and restoration of work areas.

Construction traffic on areas that will receive final stabilization through vegetative cover will be minimized to reduce soil compaction. The existing topsoil will be stockpiled onsite for reuse. Temporary stabilization will be implemented when any earth disturbing activity ceases for more than 14 calendar days. Project site disturbances will be minimized, especially on steep slopes.

It is anticipated that contaminated soils will not be encountered at the project site.

Current and final drainage or sloping of the site to the west and south of the project site direct flows towards Lake Woodmoor, which is believed to be part of the Dirty Woman watershed that also contributes to the Arkansas River watershed.

In the unlikely event of encountering groundwater during excavation, it will be pumped, diverted, and contained in the new drainage area onsite allowing for sediment control and onsite infiltration.

Size of Construction Site

Size of Property	7.82 Acres
Total Area Expected to be Disturbed by Construction Activities	7.82 Acres
Maximum Area Expected to be Disturbed at Any One Time	7.82 Acres

Type of Construction Site *(check all that apply):*

☐ Single-Family Residential ☐ Multi-Family Residential ☒ Commercial ☐ Industrial ☐ Institutional ☐ Highway or Road ☒ Utility ☒ Other Municipal Pump Station and Pipeline

Pollutant-Generating Activities

Pollutant-Generating Activity (e.g., paving operations; concrete, paint, and stucco washout and waste disposal; solid waste storage and disposal; and dewatering operations)	**Pollutants or Pollutant Constituents** (e.g., sediment, fertilizers, pesticides, paints, caulks, sealants, fluorescent light ballasts, contaminated substrates, solvents, fuels)
Concrete & Masonry	Wash out, Form Oils, Cure Chemical, Sealers
Asphalt paving	Oils
Heavy Equipment	Fuel, Oil, Grease
Coating	Paint/Caulk
Excavation	Soil/Sediment run off
Ground water	Create Soil/Sediment run off
Saw Cutting	Dust

Construction Support Activities

Onsite lay down area, Field Office, Dumpster/Trash removal

Contact information for construction support activity:
Chris Miller
218-866-0371
cmiller@stanekconstructors.com

2.4 Sequence and Estimated Dates of Construction Activities

Phase I

Construct Pipeline, Pump Station, and associated sitework

Estimated Start Date of Construction Activities for this Phase	5/17/2021
Estimated End Date of Construction Activities for this Phase	5/13/2022
Estimated Date(s) of Application of Stabilization Measures for Areas of the Site Required to be Stabilized	4/29/2022 *[Add additional dates as necessary]*
Estimated Date(s) when Stormwater Controls will be Removed	5/13/2022 *[Add additional dates as necessary]*

General Construction Sequence

1. Place BMP's
2. Install transmission pipeline
3. Excavation for pump station wet well and intake pipes
4. Construct pump station wet well
5. Install lake intake pipelines
6. Backfill pump station wet well
7. Construction pump station building
8. Install site piping and electrical lines
9. General Site Grading/berm/roadway
10. Seeding/Restoral

Item 5. Clearly define which construction tasks correspond to each phase of BMPs (initial, interim, and final) and/or phase of the project (pre-disturbance, site clearing, grading, etc) so it's clear when each BMP will be installed. See Table CP-1 in MHFD detail SM-1.

OR:

Item 5. Add a note that states there will be no phasing for this project.

2.5 Authorized Non-Stormwater Discharges

List of Authorized Non-Stormwater Discharges Present at the Site

Type of Authorized Non-Stormwater Discharge	Likely to be Present at Your Site?
Discharges from emergency fire-fighting activities	☐ Yes ☒ No
Fire hydrant flushing	☐ Yes ☒ No
Landscape irrigation	☐ Yes ☒ No
Waters used to wash vehicles and equipment	☒ Yes ☐ No
Water used to control dust	☒ Yes ☐ No
Potable water including uncontaminated water line flushing	☒ Yes ☐ No
External building washdown (soaps/solvents are not used and external surfaces do not contain hazardous substances)	☒ Yes ☐ No
Pavement wash waters	☐ Yes ☒ No
Uncontaminated air conditioning or compressor condensate	☐ Yes ☒ No
Uncontaminated, non-turbid discharges of ground water or spring water	☐ Yes ☒ No
Foundation or footing drains	☐ Yes ☒ No
Construction dewatering water	☒ Yes ☐ No

2.6 Site Maps

See Project Plans and Specs

SECTION 3: DOCUMENTATION OF COMPLIANCE WITH OTHER FEDERAL REQUIREMENTS

3.1 Endangered Species Protection

None Identified in Plans or Specifications

3.2 Historic Preservation

Per plan and specification – Existing Site nothing is expected but if encountered stop work and alert owner and engineer.

SECTION 4: EROSION AND SEDIMENT CONTROLS

Item 12. Note that this project does not anticipate utilizing batch plants in the SWMP text

4.1 Natural Buffers or Equivalent Sediment Controls

Buffer Compliance Alternatives

Are there any waters of the U.S. within 50 feet of your project's earth disturbances? ☒ YES ☐ NO

(Note: If no, no further documentation is required for Part 4.1 in the SWMP Template. Continue on to Part 4.2.)

Check the compliance alternative that you have chosen:

☐ (i) I will provide and maintain a 50-foot undisturbed natural buffer.

☐ (ii) I will provide and maintain an undisturbed natural buffer that is less than 50 feet and is supplemented by additional erosion and sediment controls, which in combination achieves the sediment load reduction equivalent to a 50-foot undisturbed natural buffer.

☐ (iii) It is infeasible to provide and maintain an undisturbed natural buffer of any size, therefore I will implement erosion and sediment controls that achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer.

☒ I qualify for one of the exceptions in Part 2.2.1.b. (If you have checked this box, provide information on the applicable buffer exception that applies, below.

Buffer Exceptions

Which of the following exceptions to the buffer requirements applies to your site?

☐ There is no discharge of stormwater to the water of the U.S. that is located 50 feet from my construction disturbances.

(Note: If this exception applies, no further documentation is required for Section 4.1 of the

☐ No natural buffer exists due to preexisting development disturbances that occurred prior to the initiation of planning for this project.

☐ For a "linear construction sites" (defined in Appendix A), site constraints (e.g., limited right-of-way) make it infeasible to meet any of the CGP Part 2.2.1.a compliance alternatives.

☐ The project qualifies as "small residential lot" construction (defined in Appendix A) (see Appendix G, Part G.3.2).

☐ For Alternative 1:

-

☐ For Alternative 2:

☐ Buffer disturbances are authorized under a CWA Section 404 permit.

☒ Buffer disturbances will occur for the construction of a water-dependent structure or water access area (e.g., pier, boat ramp, and trail).

4.2 Perimeter Controls

General

- BMP's Silt Fence and Logs – See plan Sheets CE1.0 to CE1.2

Specific Perimeter Controls

INSERT NAME OF PERIMETER CONTROL TO BE INSTALLED	
Description: Silt Fence and Logs	
Installation	TBD
Maintenance Requirements	Inspection and Correct deficiencies
Design Specifications	See Project Plans and Specs

4.3 Sediment Track-Out

Item 13. Discuss off-site soil tracking (ie: street sweeping)

General

- Vehicle Track out Control – See plan Sheet C1.0 and CE1.4 Detail SM-4

Specific Track-Out Controls

INSERT NAME OF TRACK-OUT CONTROL TO BE INSTALLED	
Description: Vehicle Track out Mat	
Installation	TBD
Maintenance Requirements	Inspect, clean or replace as needed
Design Specifications	See plans and Specs

4.4 Stockpiled Sediment or Soil

General

- Located inside perimeter controls and used timeline to be limited

Specific Stockpile Controls

Description: Silt Fence or Temp Stabilization if needed	
Installation	TBD
Maintenance Requirements	Inspections
Design Specifications	See plans & Specs

4.5 Minimize Dust

General

- Water as required

Specific Dust Controls

Description: Wet/water as required	
Installation	TBD
Maintenance Requirements	Visual inspection

Design Specifications	See plans and Specs

SECTION 5: POLLUTION PREVENTION STANDARDS

5.1 Potential Sources of Pollution

Construction Site Pollutants

Potential sources of pollution:

1. Soil runoff from excavations during rain or snow event.
2. Vehicle track out
3. Fuel, oil or grease from construction equipment.
4. Materials and chemicals used during construction.
5. Dust
6. Concrete washouts
7. Dumpsters/Porta toilets
8. Masonry mixing stations
9. Loading and unloading operations

Practices used:

1. The use of BMP's as detail on plan sheet plan Sheet CE1.0 to CE1.2.
2. Proper storage and containment of fuel, oil and grease, Use of proper containers
3. Proper storage and containment of chemical and construction materials per SDS data
4. Inspect and Maintain of BMP's and Storage/containment (See Dot Form)
5. Dust Control by watering
6. Concrete trucks, including the concrete truck chute, will be washed out into a dedicated concrete washout. See Detail MM-1 / CE1.3.
7. Portable toilet service from professional provider
8. Garbage service picked up regularly avoiding overflow
9. On Site universal Spill Kit with basic absorbing socks/pads etc.
10. The portable toilets will be anchored in place with concrete stakes.
11. For the masonry mixing stations, a dirt berm will be built around the masonry mixing station to contain any potential spills.
12. For loading and unloading operations, dust control by watering and keeping spill control supplies and cleanup materials onsite near the loading and unloading area.

5.2 Spill Prevention and Response

Chemicals will be stored in watertight containers or in a weather tight job storage container, with appropriate secondary containment. Spill Kits will be kept onsite and be readily available. Spills will be reported to the proper authority.

Secondary containment of sanitation facilities will be accomplished by surrounding the facilities with wood framing and attaching poly to the framing to line the entire area under the facilities. They will also be cleaned and inspected regularly for leaks and spills.

Concrete washout areas will be lined and bermed so there is no leakage or overflow into the underlying soil and onto the surrounding areas. Washout areas will be positioned away from drain inlets or waterways and be clearly labeled.

Good housekeeping practices will be used for vehicle storage and maintenance, including not allowing fuel, oil, or grease to leak into the soil, placing all equipment or vehicles that are to be fueled, maintained, or stored in a designated area fitted with appropriate BMPs, and cleaning leaks immediately and disposing of leaked materials properly.

5.3 Fueling and Maintenance of Equipment or Vehicles

General

- Portable Fuels tanks and Cans, stored properly, spill kits

Specific Pollution Prevention Practices

Description: Containment	
Installation	TBD
Maintenance Requirements	Clean, Inspect Replace if needed
Design Specifications	D.O.T.

5.5.5 Construction and Domestic Waste

Item 13. Discuss inspection procedure for checking waste disposal bins for leaks and overflowing capacity. And discuss frequency that they will be emptied (or at what level of capacity would trigger the need to be emptied)

General

- Dumpster Service for construction Waste

Specific Pollution Prevention Practices

Description: Professional disposal	
Installation	TBD
Maintenance Requirements	**Regular Pickup**
Design Specifications	n/a

5.5.6 Sanitary Waste

Toilets: Portable toilets will be located a minimum of 10 feet from stormwater inlets and 50 feet from state waters. They will be secured at all four corners to prevent overturning and cleaned on a weekly basis. They will be inspected daily for spills.

General

- Professional services

Specific Pollution Prevention Practices

Description: Portable toilets	
Installation	TBD
Maintenance Requirements	Regular service and pumping

Design Specifications	N/a

SECTION 6: INSPECTION, MAINTENANCE, AND CORRECTIVE ACTION

6.1 Inspection Personnel and Procedures

Personnel Responsible for Inspections

Stanek Superintendent – Chris Miller

Inspection Schedule

Select the inspection frequency(ies) that applies, based on CGP Parts 4.2, 4.3, or 4.4

(Note: you may be subject to different inspection frequencies in different areas of the site. Check all that apply)

Standard Frequency:

☐ Every 7 days

☒ Every 14 days and after any precipitation or snowmelt event that cause surface erosion

Increased Frequency (if applicable):

For areas of sites discharging to sediment or nutrient-impaired waters or to waters designated as Tier 2, Tier 2.5, or Tier 3

☐ Every 7 days and within 24 hours of a 0.25" rain

Reduced Frequency (if applicable)

For stabilized areas

☐ Twice during first month, no more than 14 calendar days apart; then once per month after first month;

(Note: It is likely that you will not be able to include this in your initial SWMP. If you qualify for this reduction (see CGP Part 4.4.1), you will need to modify your SWMP to include this information.)

For stabilized areas on "linear construction sites"

☐ Twice during first month, no more than 14 calendar days apart; then once more within 24 hours of a 0.25" rain

(Note: It is likely that you will not be able to include this in your initial SWMP. If you qualify for this reduction (see CGP Part 4.4.1), you will need to modify your SWMP to include this information.)

For arid, semi-arid, or drought-stricken areas during seasonally dry periods or during drought

☐ Once per month and within 24 hours of a 0.25" rain

Insert beginning and ending dates of the seasonally-defined dry period for your area or the valid period of drought:

- Beginning date of seasonally dry period:
- Ending date of seasonally dry period:

For frozen conditions where earth-disturbing activities are being conducted

☐ Once per month

Insert beginning and ending dates of frozen conditions on your site:

- Beginning date of frozen conditions:
- Ending date of frozen conditions:

Self-Monitoring Inspections – Identify QSM in the SWMP and provide documentation of their credentials and/or state: "The QSM will be sufficiently qualified for the required duties per the ECM Appendix I.5.2.A"

Item 22. Add a section describing Final Stabilization and Long-term SW Quality.
Item 23. see checklist
Item 24. see checklist
Item 26. Add a note stating that this project does not rely on control measures owned or operated by another entity.

Rain Gauge Location (if applicable)

Inspection Report Forms

See form

Item 25. Add a note stating that the inspection log must include a signature. And discuss location of SWMP records onsite.

6.2 Corrective Action

Personnel Responsible for Corrective Actions
Stanek Superintendent

Corrective Action Forms
See Form

Item 21. Describe your procedure for how SWMP will be revised.
Add text stating that the SWMP should be viewed as a "living document" that is continuously being reviewed and modified as a part of the overall process of evaluating and managing stormwater quality issues at the site. The Qualified Stormwater Manager shall amend the SWMP when there is a change in design, construction, operation or maintenance of the site which would require the implementation of new or revised BMPs or if the SWMP proves to be ineffective in achieving the general objectives of controlling pollutants in stormwater discharges associated with construction activity or when BMPs are no longer necessary and are removed.

6.3 Delegation of Authority

Duly Authorized Representative(s) or Position(s):
Stanek Constructors
Chris Miller - Superintendent

SECTION 7: CERTIFICATION AND NOTIFICATION

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 gathered and evaluated 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 have no personal knowledge that the information submitted is other than 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.

Name: Sherri Leonard Title: Project Manager

Signature:  Date: 4/21/2021

SWMP Amendment Log

No.	Description of the Amendment	Date of Amendment	Amendment Prepared by [Name(s) and Title]

WOODMOOR WATER AND SANITATION DISTRICT NO.1

LAKE PUMP STATION NO. 2 AND TRANSMISSION PIPELINE

EL PASO COUNTY, COLORADO

PERMIT SET

CONTACTS

OWNER:	WOODMOOR WATER AND SANITATION DISTRICT NO. 1 1845 WOODMOOR DRIVE MONUMENT, CO 80132	JESSIE SHAFFER, P.E. (719) 488-2525 JESSIES@WOODMOORWATER.COM
ENVIRONMENTAL ENGINEER:	JVA, INC 1512 LARIMER STREET, SUITE 710 DENVER, CO 80202	RICHARD HOOD, P.E. (303) 565-4901 RHOOD@JVAJVA.COM
STRUCTURAL ENGINEER:	JVA, INC 1512 LARIMER STREET, SUITE 710 DENVER, CO 80202	ADAM TEUNISSEN, P.E. (303) 565-4936 ATEUNISSEN@JVAJVA.COM
ELECTRICAL ENGINEER:	BROWNS HILL ENGINEERING AND CONTROLS 8130 SHAFFER PARKWAY, SUITE A LITTLETON, CO 80127	TED WILLE, P.E. (720) 344-7771 TWILLE@BROWNSHILLENG.COM
MECHANICAL ENGINEER:	MEC, INC. 4919 W. 98TH WAY WESTMINSTER, CO 80031	BRYAN MOEN, P.E. (303) 907-4285 BMOEN@MECENGR.COM

CONSULTING ENGINEERS

JVA, Inc. 1512 Larimer Street, Suite 710
Denver, CO 80202 303.444.1951
www.jvajva.com
Boulder • Fort Collins • Winter Park
Glenwood Springs • Denver

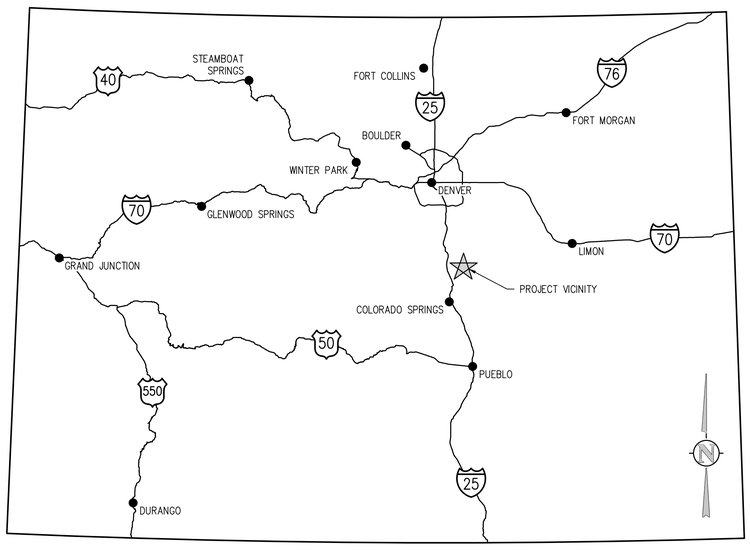
APRIL 2021

PREPARED UNDER THE SUPERVISION OF

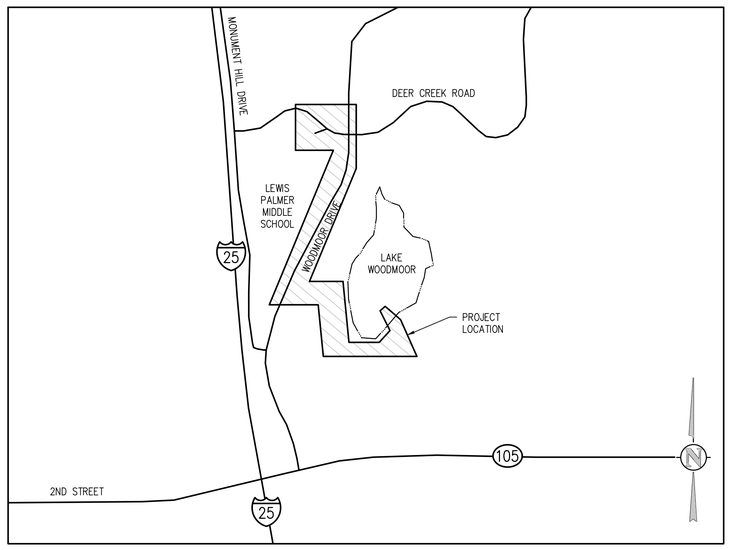
JVA, Inc.

COLORADO REGISTERED JOSHUA J. MCCRARY 40279 04/06/21 PROFESSIONAL ENGINEER

DRAWING INDEX



VICINITY MAP
NTS



PROJECT LOCATION MAP
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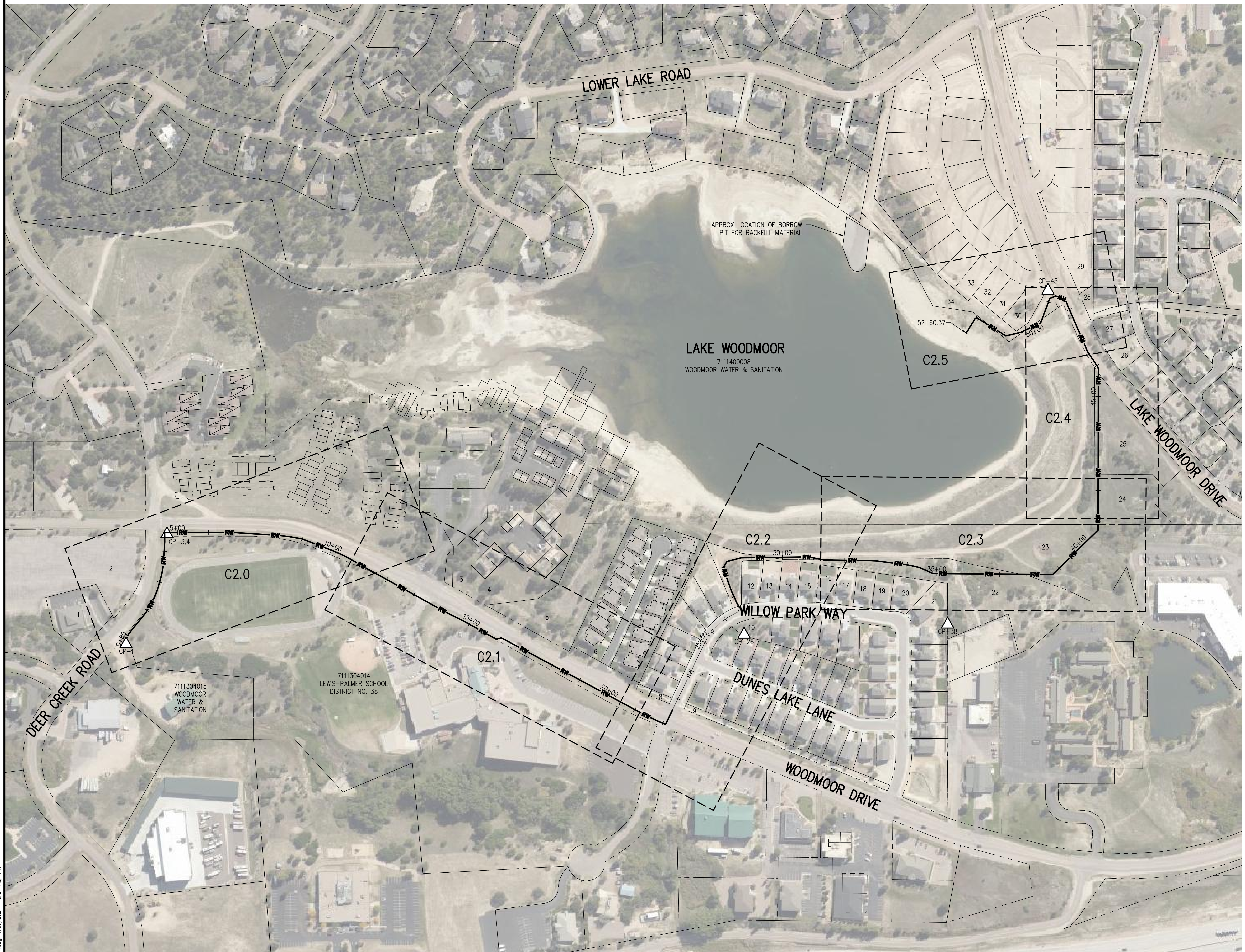

ADJACENT PROPERTIES		
REFERENCE NUMBER	PARCEL NUMBER	PARCEL OWNER
1	7111301009	REDNER FAMILY TRUST
2	7111301010	TRI-LAKES CHAPEL INC
3	7111406056	WOODMOOR LAKEHOUSE ASSN INC
4	7111406055	WOODMOOR LAKEHOUSE ASSN INC
5	7111305005	WOODMOOR WATER & SANITATION
6	7111305034	VILLAGE AT MOOR-WOOD OWNERS ASSN
7	7114204018	TAHSK LLC
8	7114205032	DUNES AT WOODMOOR HOMEOWNERS ASSN
9	7114207014	DUNES AT WOODMOOR HOMEOWNERS ASSN
10	7114208019	DUNES AT WOODMOOR HOMEOWNERS ASSN
11	7114205011	FORRISTAL JEFFREY
12	7114205012	ILARRAZA ERIC
13	7114205013	MATTEA MELISSA
14	7114205014	FRIEND EVA K
15	7114205015	MCGOUGH ALBERT C
16	7114205016	TRASK CRAIG
17	7114205017	HARRIS NATHAN P
18	7114205018	FLORIA JOHN JR
19	7114205019	KRAEMER MAX W
20	7114205020	ULRICH DAN L
21	7114205021	HAMILTON-SMITH DAVID
22	7114205030	DUNES AT WOODMOOR HOMEOWNERS ASSN
23	7114200041	WOODMOOR WATER & SANITATION
24	7114112001	CS LAND COMPANY LLC
25	7114112002	CS LAND COMPANY LLC
26	7114109007	JONES JENNIFER KRISTEN
27	7114109008	SARGENT GREGORY LEE
28	7114100015	WOODMOOR WATER & SANITATION
29	7114109034	LAKE WOODMOOR DEVELOPMENT INC
30	7114107019	CAMPBELL HOMES LLC
31	7114107020	CAMPBELL HOMES LLC
32	7114107021	KANGAS GARY E JR
33	7114107022	MAGILL ROBERT T
34	7114107034	LAKE WOODMOOR DEVELOPMENT INC

150 0 150 300
SCALE IN FEET

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www.jvajva.com
Boulder • Fort Collins • Winter Park
Glenwood Springs • Denver

NO.	DATE	DES'D	DWN	REVISION DESCRIPTION

COLORADO REGISTERED PROFESSIONAL ENGINEER 40279 04/06/21

DESIGNED BY:	RAH/MHT
DRAWN BY:	MHT
CHECKED BY:	JJM
JOB #:	1051.6e
DATE:	APRIL 2021

WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

OVERALL KEY MAP

SHEET NO.
C0.1

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EROSION AND SEDIMENTATION NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR INSTALLING AND MAINTAINING ALL CONTROLS DURING INITIAL, INTERIM, AND FINAL CONDITIONS.
2. ALL CONTROLS SHALL BE INSTALLED WITHIN THE PROPERTY LINES UNLESS OTHERWISE SPECIFIED. WHEN CONSTRUCTION ACTIVITIES DISTURB ADJACENT AND/OR RIGHT-OF-WAY PROPERTIES, COORDINATION WITH PROPERTY OWNERS IS REQUIRED PRIOR TO CONSTRUCTION.

EROSION CONTROL LEGEND

- EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- PROPOSED INDEX CONTOUR
- PROPOSED INTERMEDIATE CONTOUR
- LIMITS OF CONSTRUCTION
- VEHICLE TRACKING CONTROL
- SEDIMENT CONTROL LOG
- ROCK SOCK
- CONCRETE WASHOUT AREA
- STABILIZED STAGING AREA
- PERMANENT SEEDING
- REMOVE EXISTING TREE
- PROTECT EXISTING TREE

WOODMOOR DR
ROW- 80'

DEER CREEK RD
60' ROW

LIMIT OF RIGHT-OF-WAY

LIMITS OF CONSTRUCTION (TYP)

PERMANENT SEEDING IN DISTURB VEGETATED GROUND RE: MHFCD EC-2 SHEET CE1.5 (TYP)

EXIST RIPRAP

SEDIMENT CONTROL LOG (LAY AGAINST FENCE)

SEDIMENT CONTROL LOG RE: MHFCD SC-2 SHEET CE1.4 (TYP)

12" RAW WATER TRANSMISSION MAIN (TYP)

PRETREATMENT BUILDING
(UNDER SEPARATE CONTRACT)
CONTRACTOR SHALL COORDINATE EROSION CONTROL BMP'S WITH THIS PROJECT TO ENSUR ADEQUATE COVERAGE

STABILIZED STAGING AREA RE: MHFCD SC-2 SHEET CE1.3 (COORDINATE LOCATION(S) WITH WSD)

Disturbed Area. Areas inside of these limits that are not pavement, gravel, or landscaping will be seeded after construction.

MATCHLINE - SEE BELOW

SANITARY MANHOLE RIM ELEV. 7150.81'

16' UTILITY EASEMENT (TYP)

10' PUBLIC DRAINAGE EASEMENT (TYP)

SCALE IN FEET: 20 0 20 40

WOODMOOR DR
ROW- 80'

LIMIT OF RIGHT-OF-WAY

ROCK SOCK RE:MHFCD SC-5 SHEET CE1.4 (TYP)

LIMITS OF CONSTRUCTION (TYP)

12" RAW WATER TRANSMISSION MAIN (TYP)

SANITARY MANHOLE RIM ELEV. 7104.90' (UNABLE TO OPEN)

MATCHLINE - SEE ABOVE

MATCHLINE - SEE CE1.1

SCALE IN FEET: 20 0 20 40

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NO.	DATE	DES'D	DWN	REVISION DESCRIPTION

COLORADO REGISTERED JOSHUA J. MCGRATH 40279 04/06/21 PROFESSIONAL ENGINEER

DESIGNED BY:	RAH/MHT
DRAWN BY:	MHT
CHECKED BY:	JJM
JOB #:	1051.6e
DATE:	APRIL 2021

WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

EROSION CONTROL PLAN

SHEET NO.
CE1.0

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EROSION AND SEDIMENTATION NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR INSTALLING AND MAINTAINING ALL CONTROLS DURING INITIAL, INTERIM, AND FINAL CONDITIONS.
2. ALL CONTROLS SHALL BE INSTALLED WITHIN THE PROPERTY LINES UNLESS OTHERWISE SPECIFIED. WHEN CONSTRUCTION ACTIVITIES DISTURB ADJACENT AND/OR RIGHT-OF-WAY PROPERTIES, COORDINATION WITH PROPERTY OWNERS IS REQUIRED PRIOR TO CONSTRUCTION.

EROSION CONTROL LEGEND

- EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- PROPOSED INDEX CONTOUR
- PROPOSED INTERMEDIATE CONTOUR
- LIMITS OF CONSTRUCTION
- VEHICLE TRACKING CONTROL
- SEDIMENT CONTROL LOG
- ROCK SOCK
- CONCRETE WASHOUT AREA
- STABILIZED STAGING AREA
- PERMANENT SEEDING
- REMOVE EXISTING TREE
- PROTECT EXISTING TREE

MATCHLINE – SEE CE1.0

ROCK SOCK RE: MHFCD SC-5 SHEET CE1.4 (TYP)

LIMIT OF RIGHT-OF-WAY

EXIST 12" RAW WATER TRANSMISSION MAIN (TYP)

VEHICLE TRACKING CONTROL RE: MHFCD SM-4 SHEET CE1.4

SEDIMENT CONTROL LOG RE: MHFCD SC-2 SHEET CE1.4 (TYP)

12" RAW WATER TRANSMISSION MAIN (TYP)

LIMITS OF CONSTRUCTION (TYP)

MATCHLINE – SEE BELOW

WOODMOOR DR ROW= 80'

DUNES LAKE LN ROW= 50'

WILLOW PARK WAY ROW= 50'

Disturbed Area. Areas inside of these limits that are not pavement, gravel, or landscaping will be seeded after construction.

SCALE IN FEET

MATCHLINE – SEE ABOVE

MATCHLINE – SEE CE1.2

LIMITS OF CONSTRUCTION (TYP)

12" RAW WATER TRANSMISSION MAIN (TYP)

PERMANENT SEEDING IN DISTURB VEGETATED GROUND RE: MHFCD EC-2 SHEET CE1.5 (TYP)

GATE TO WSD OFFICE

SCALE IN FEET

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EL PASO COUNTY, COLORADO

EROSION CONTROL PLAN

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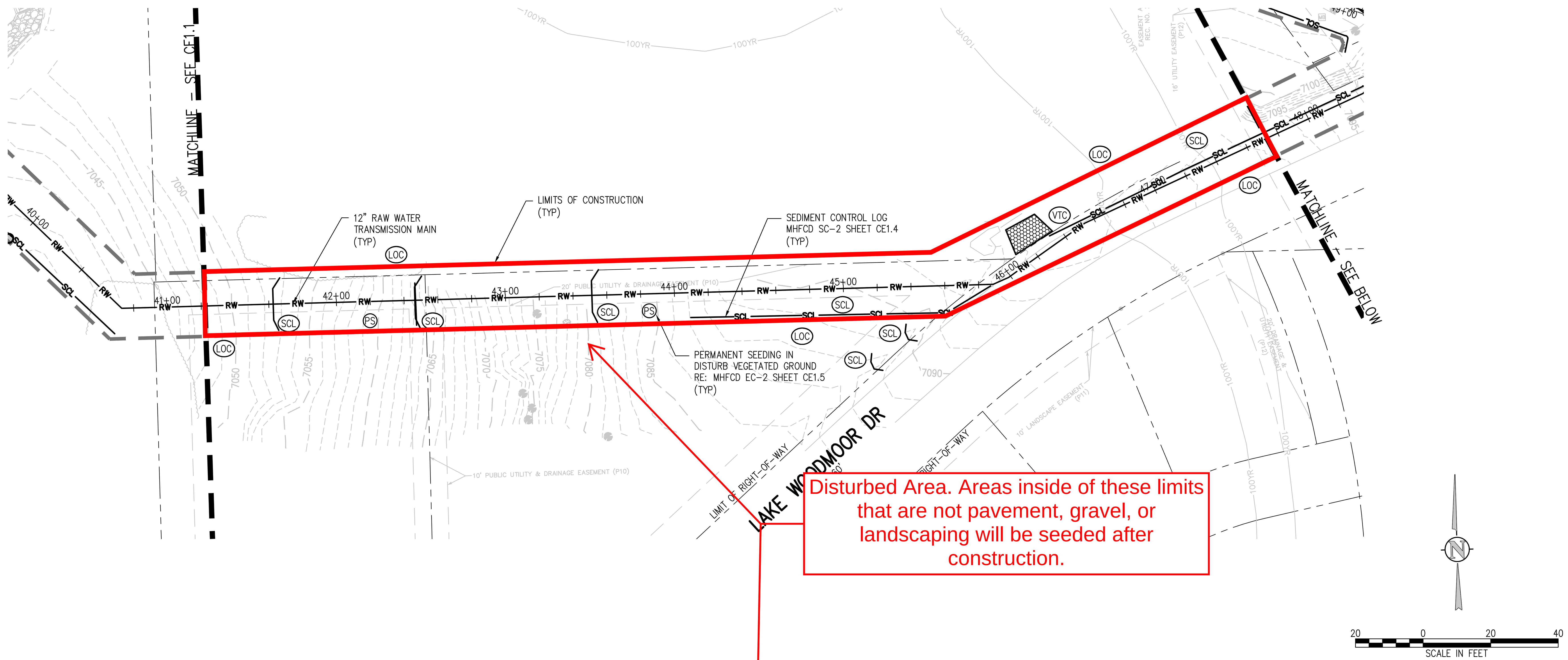
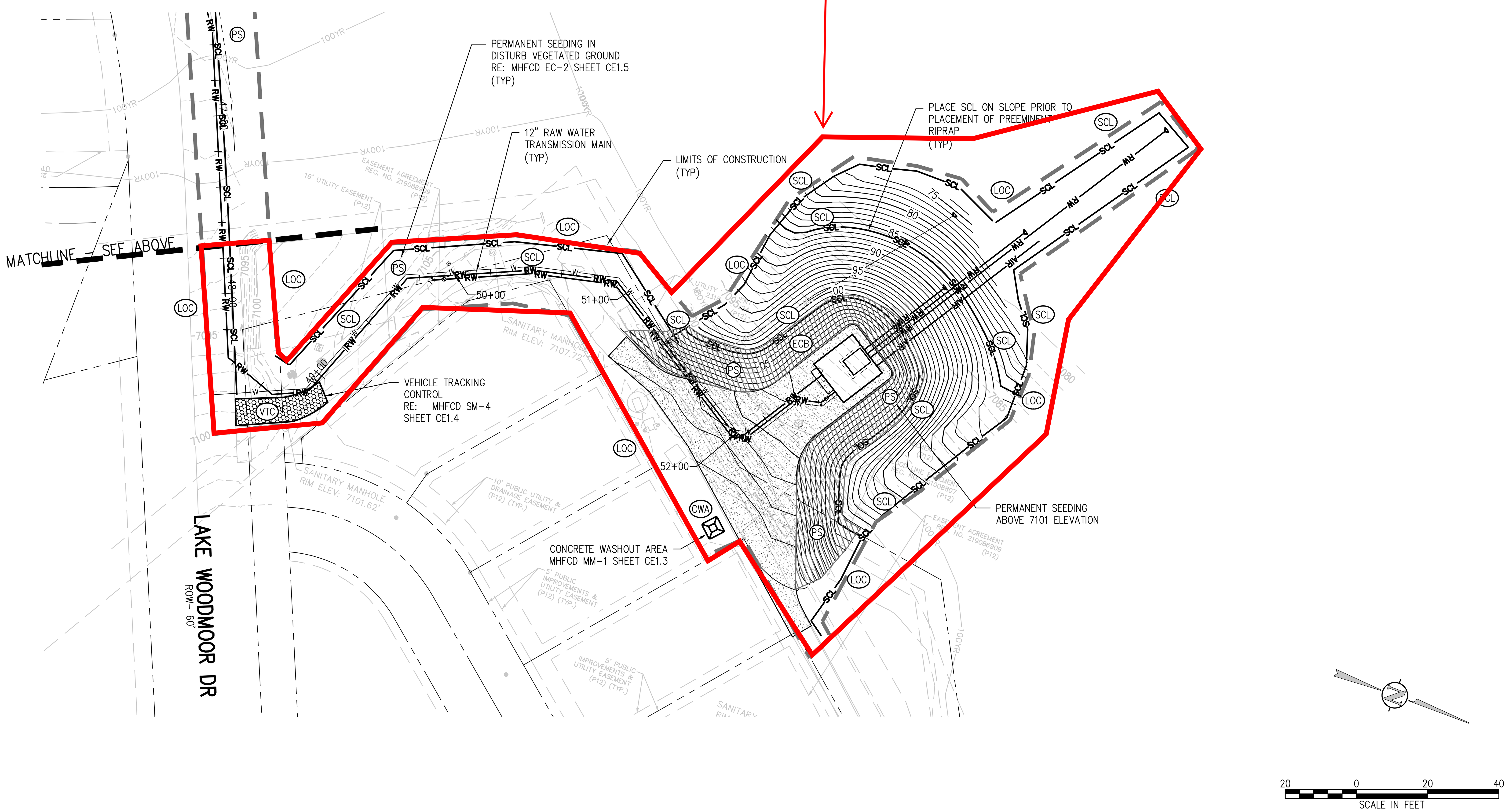
N:\1051.6e\Drawings\1051.6e – CE10 – ECP.dwg, 4/06/2021 – 5:24 PM, mht





EROSION AND SEDIMENTATION NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR INSTALLING AND MAINTAINING ALL CONTROLS DURING INITIAL, INTERIM, AND FINAL CONDITIONS.
2. ALL CONTROLS SHALL BE INSTALLED WITHIN THE PROPERTY LINES UNLESS OTHERWISE SPECIFIED. WHEN CONSTRUCTION ACTIVITIES DISTURB ADJACENT AND/OR RIGHT-OF-WAY PROPERTIES, COORDINATION WITH PROPERTY OWNERS IS REQUIRED PRIOR TO CONSTRUCTION.

EROSION CONTROL LEGEND

- EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- PROPOSED INDEX CONTOUR
- PROPOSED INTERMEDIATE CONTOUR
- (LOC) LIMITS OF CONSTRUCTION
- (VTC) VEHICLE TRACKING CONTROL
- (SCL) SEDIMENT CONTROL LOG
- (RS) ROCK SOCK
- (CWA) CONCRETE WASHOUT AREA
- (SSA) STABILIZED STAGING AREA
- (ECB) EROSION CONTROL BLANKET
- (PS) PERMANENT SEEDING
- REMOVE EXISTING TREE
- PROTECT EXISTING TREE

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NO.	DATE	DES'D	DWN	REVISION DESCRIPTION

COLORADO REGISTERED PROFESSIONAL ENGINEER JOSHUA J. McGIBBON 40279 04/06/21

DESIGNED BY:	RAH/MHT
DRAWN BY:	MHT
CHECKED BY:	JJM
JOB #:	1051.6e
DATE:	APRIL 2021

WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

EROSION CONTROL PLAN

SHEET NO.
CE1.2

STORMWATER MANAGEMENT PLAN (SWMP)

THIS STORMWATER MANAGEMENT PLAN IS TO BE RETAINED AND MAINTAINED ONSITE INCLUDING FINAL LANDSCAPING PLANS AND ANY OTHER EROSION CONTROL DOCUMENTATION. A SWMP ADMINISTRATOR WILL BE DESIGNATED BY THE CONTRACTOR AND IS RESPONSIBLE FOR DEVELOPING, IMPLEMENTING, MAINTAINING, AND REVISING THIS SWMP. THE SWMP ADMINISTRATOR IS THE CONTACT FOR ALL SWMP-RELATED ISSUES AND IS RESPONSIBLE FOR ITS ACCURACY, COMPLETENESS, AND IMPLEMENTATION. THE FOLLOWING HAS BEEN DESIGNATED AS THE SWMP ADMINISTRATOR FOR THIS PROJECT:

NAME: _____

CONTACT INFO: _____

_____

THE SITE IS LOCATED AT IN THE VICINITY OF WOODMOOR LAKE, MONUMENT COLORADO. THE WOODMOOR WATER AND SANITATION DISTRICT DEVELOPED A CAPITAL IMPROVEMENT PLAN (CIP) IN 2020. ONE OF THESE IMPROVEMENTS CONSISTS OF EXPANSION OF THE LAKE PUMP STATION CAPACITY AND ADDITION OF A RAW WATER TRANSMISSION PIPELINE. THESE IMPROVEMENTS ARE NECESSARY TO PROVIDE SURFACE WATER TO THEIR CENTRAL WATER TREATMENT PLANT. REFER TO SHEET C0.1 (OVERALL KEY MAP) FOR AND OVERVIEW OF THE EXTENTS OF THE PIPELINE ALIGNMENT AND LAKE PUMP STATION LOCATION. THE TOTAL SITE AREA (INCLUDING THE PIPELINE) IS APPROXIMATELY **1.5** ACRES WITH AT TOTAL DISTURBANCE OF **1.5** ACRES. NO CONSTRUCTION ACTIVITIES SHALL OCCUR OFFSITE OR OUTSIDE OF THE CONSTRUCTION LIMITS SHOWN ON THE CONSTRUCTION DOCUMENTS. THE SEQUENCE OF CONSTRUCTION STARTS IS AS FOLLOWS:

PHASE	ESTIMATED	ACTUAL
CONSTRUCTION START	JULY, 2021	_____
ROAD AND OVERLOT GRADING	SEPTEMBER, 2021	_____
TRANSMISSION PIPELINE CONSTRUCTION	AUGUST, 2021	_____
LAKE PUMP STATION CONSTRUCTION	NOVEMBER, 2021	_____
SITE RESTORATION	MAY, 2022	_____

THE EXISTING SITE CONSISTS OF DEVELOPED LAND WITH RESIDENTIAL LOTS AND PAVED STREETS , NATIVE GRASSLAND, AND PARTIALLY LANDSCAPED VEGETATION, AND IS APPROXIMATELY 80% COVERED WITH VEGETATIVE GROUND COVER. A DRAINAGE REPORT WAS NOT PREPARED FOR THIS PROJECT BECAUSE THE MAJORITY OF DISTURB AREAS WILL BE RESTORED CLOSELY TO THE PRE-CONSTRUCTION GRADE AND VEGETATIVE COVER. NEW GRADING WILL OCCUR AT THE SITE OF THE PROPOSED LAKE PUMP STATION. HOWEVER, IT WILL BE ADJACENT TO WOODMOOR LAKE. RIPRAP AND OTHER PERMANENT SLOPE STABILIZATION MEASURE WILL BE IMPLEMENTED HERE.

OFFSITE RUNOFF FLOWS HAVE NOT BEEN DEFINED ALONG THE PIPELINE ALIGNMENT. A PORTION OF THE PIPELINE WILL BE CONSTRUCTED ADJACENT TO RESIDENTIAL STREETS. THEREFORE, MOST OF THE RUNOFF TO THE PIPELINE INSTALLATION AREA WILL COME FROM THE STREETS DURING STORM EVENTS. ADDITIONALLY, RUNOFF WILL COME FROM OVERLAND FLOW WITHIN THE NATIVE GRASSLAND AREAS WHERE THE PIPELINE WILL BE INSTALLED BELOW THE LAKE WOODMOOR DAM.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE LOCATION OF A STABILIZED STAGING AREA WITH THE WOODMOOR WATER AND SANITATION DISTRICT. OTHER POTENTIAL POLLUTION SOURCES SUCH AS VEHICLE FUELING, STORAGE OF FERTILIZER OR CHEMICALS WILL BE CONFINED TO THIS LOCATION (OR WILL NOT EXIST AT THIS SITE).

BEST MANAGEMENT PRACTICES FOR STORMWATER MANAGEMENT

NON STRUCTURAL BMPS WILL BE IMPLEMENTED TO THE MAXIMUM EXTENT POSSIBLE. THE UTILIZATION OF NON STRUCTURAL BMPS WILL BE AN ONGOING PROCESS DIRECTED AT PREVENTING EROSION. THE NON STRUCTURAL BMPS WILL RECEIVE CONTINUOUS EMPHASIS THROUGHOUT CONSTRUCTION BECAUSE THEY AVERT PROBLEMS BEFORE THEY OCCUR AND REDUCE THE NEED FOR STRUCTURAL BMPS. NON STRUCTURAL BMPS WILL CONSIST PRIMARILY OF PRESERVATION OF EXISTING MATURE VEGETATION AND TREES, PLANNING AND SCHEDULING CONSTRUCTION ACTIVITIES AIMED AT ACHIEVING THE GOAL OF MINIMIZING EROSION. FURTHERMORE, CONSTRUCTION PERSONNEL WILL BE INSTRUCTED AND SUPERVISED IN CONSTRUCTION METHODS CONSISTENT WITH EROSION PREVENTION PRACTICES.

PLANNED STRUCTURAL BMPS FOR EROSION AND SEDIMENT CONTROL ARE SHOWN ON THE EROSION AND SEDIMENTATION CONTROL PLAN. IMPLEMENTING THESE MEASURES SHOULD MINIMIZE NUISANCE SILT AND SEDIMENTATION EXITING THE SITE AND PREVENT CLOGGING EXISTING STORM SEWERS AND STREET GUTTERS.

APPLICATION OF THESE BMPS FOR STORMWATER MANAGEMENT ARE FOR CONSTRUCTION PERIODS AND ARE CONSIDERED TEMPORARY. POST-DEVELOPMENT STORMWATER MANAGEMENT IS PROVIDED THROUGH (VEGETATED LANDSCAPED AREAS, GRASSED SWALES, AND RIPRAP PROTECTION.

VEHICLE TRACKING CONTROL (VTC):

A STABILIZED CONSTRUCTION ENTRANCE WILL BE PROVIDED AS COORDINATED BY THE DISTRICT AND CONTRACTOR(S). THE EROSION CONTROL PLAN SHOWS POTENTIAL LOCATIONS BASED ON REASONABLE CONCLUSIONS. THE CONSTRUCTION ACCESS AND PARKING WILL BE GRADED AND COVERED WITH A CRUSHED STONE BASE COURSE DURING CONSTRUCTION. THE VEHICLE TRACKING CONTROL WILL BE RELOCATED WITH THE CONSTRUCTION ACCESS AS NECESSARY.

SILT FENCING (SF) AND SEDIMENT CONTROL LOGS (SCL):

SILT FENCING AND SEDIMENT CONTROL LOGS SHALL BE INSTALLED WITH RESPECT TO PROPOSED DRAINAGE PATTERNS. SEDIMENT CONTROL LOGS ARE SHOWN ON THE EROSION CONTROL PLAN INSTALLED ALONG THE PIPELINE ALIGNMENT AND ALONG ANY DRAINAGE AREAS SUBJECT TO EROSION. THE SILT FENCING AND SEDIMENT CONTROL LOGS SHALL BE INSTALLED AT THE DOWNHILL SIDE OF THE EXISTING SLOPES ACROSS THE SITE AND AT ALL POINT DISCHARGE AREAS WHETHER SHOWN OR NOT, SILT FENCE AND SEDIMENT CONTROL LOGS SHALL BE MAINTAINED AS NEEDED THROUGHOUT THE CONSTRUCTION PROCESS. THE TEMPORARY SILT FENCE AND SEDIMENT CONTROL LOGS WILL REMAIN UNTIL THE STORM SEWER STRUCTURES ARE COMPLETED AND GROUND COVER IS EFFECTIVE.

OVERLOT GRADING:

ALL OPEN AREAS WILL BE TREATED WITHIN 14 DAYS OF COMPLETION OF THE OVERLOT GRADING. ALL OVERLOT GRADING IN THE NON-IRRIGATED AREAS WILL HAVE THE SURFACE ROUGHENED AND WILL BE PERMANENTLY LANDSCAPED OR TEMPORARILY SEEDED UNTIL THE PLANNED INSTALLATIONS ARE COMPLETED. AT THE COMPLETION OF THE MASS GRADING, ALL EXPOSED SOIL AREAS WILL HAVE THE SURFACE ROUGHENED AND PLANTED WITH A REVEGETATION SEED MIX. VEGETATION IS TO BE MAINTAINED THROUGHOUT CONSTRUCTION BY THE CONTRACTOR UNTIL AREAS ARE PERMANENTLY LANDSCAPED. ALTERNATELY, ROUGH-CUT DRIVEWAYS OR PROPOSED PAVED AREAS CAN BE COVERED WITH A LAYER OF AGGREGATE, ROAD BASE OR ASPHALT PAVING.

DUST CONTROL MEASURES:

DISTURBED AREAS NOT YET READY TO BE SEEDED, LANDSCAPES, PAVED, OR OTHERWISE STABILIZED SHALL BE WATERED, OR RIPPED AS NECESSARY TO PRECLUDE VISIBLE DUST EMISSIONS.

ITEMS ARE SCHEDULED TO BE IMPLEMENTED ACCORDING TO THE CONSTRUCTION SCHEDULE. AS WORK PROCEEDS, IMPLEMENTATION OF INDIVIDUAL BMPS IS TO COINCIDE WITH THE CONSTRUCTION THEREBY MINIMIZING THE EXPOSURE OF UNPROTECTED AREAS. THE SILT FENCE, INLET PROTECTION (FOR EXISTING INLETS), AND GRAVELING OF THE CONSTRUCTION ENTRANCE WILL BE PERFORMED WHEN THE GRADING BEGINS. THE INLET PROTECTION WILL BE INSTALLED AS THE STORM SEWER STRUCTURES ARE CONSTRUCTED. THE RIPRAP PROTECTION WILL BE INSTALLED AS THE STORM SEWER OUTFALLS OR CULVERTS ARE CONSTRUCTED. THE STRUCTURAL BMPS THAT DO NOT BECOME PART OF THE PERMANENT STORMWATER MANAGEMENT PLAN ARE TO BE REMOVED, AS THE PAVING, LANDSCAPING, AND OTHER PERMANENT GROUNDCOVER INSTALLATIONS ARE COMPLETED. FUGITIVE DUST EMISSIONS RESULTING FROM GRADING ACTIVITIES AND/OR WIND SHALL BE CONTROLLED USING THE BEST AVAILABLE CONTROL TECHNOLOGY AS DEFINED BY THE COLORADO DEPARTMENT OF HEALTH AT THE TIME OF GRADING. THE GRAVELING IS TO BE MAINTAINED AND EXTENDED CONSTRUCTION PROGRESSES ESPECIALLY AROUND THE BUILDING SITE. THE STRUCTURAL BMPS ARE TO BE REMOVED, AS THE PERMANENT LANDSCAPING INSTALLATIONS ARE COMPLETED.

THE EROSION AND SEDIMENT CONTROL PLAN MAY BE MODIFIED BY THE OWNER'S ENGINEER, COUNTY ENGINEERING INSPECTORS, MUNICIPALITY, WSD, OR ITS AUTHORIZED REPRESENTATIVE AS FIELD CONDITIONS WARRANT.

ERMANENT STABILIZATION MEASURES:

PERMANENT LANDSCAPING WILL INCLUDE SEEDING TO OPEN AREAS. NATIVE PERENNIAL SEEDING WILL BE ESTABLISHED IN NON-IRRIGATED AREAS. ALL PERMANENT STABILIZATION MEASURES WILL BE SPECIFIED BY THE OWNER.

MATERIALS AND SPILL PREVENTION:

THE CONTRACTOR WILL STORE CONSTRUCTION MATERIALS AND EQUIPMENT IN CONFINED AREAS ON SITE FROM WHICH RUNOFF WILL BE CONTAINED AND FILTERED. MATERIALS WILL BE STORED OFF THE GROUND AND PROTECTED FROM THE WEATHER BY A COVER OR STORED IN A CONTAINER SUCH AS A VAN OR TRAILER. AN EARTHEN DIKE WILL BE CONSTRUCTED AROUND THE PERIMETER OF THE FUEL STORAGE AREA TO PREVENT MATERIALS FROM CONTACT WITH SURFACE RUNOFF. EQUIPMENT MAINTENANCE WILL BE PERFORMED IN A DESIGNATED AREA AND STANDARD MAINTENANCE PROCEDURES, SUCH AS THE USE OF DRIP PANS, WILL BE USED TO CONTAIN PETROLEUM PRODUCTS.

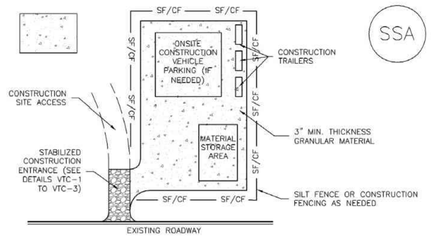
INSPECTION AND MAINTENANCE:

THE EROSION CONTROL MEASURES WILL BE INSPECTED DAILY DURING CONSTRUCTION BY THE CONTRACTOR AND AFTER EACH RAIN EVENT. ALL INSPECTIONS SHALL BE DOCUMENTED AND SHALL INCLUDE THE DATE OF INSPECTION, ANY INCIDENCE OF NON-COMPLIANCE, SIGNED CERTIFICATION THAT THE SITE IS IN COMPLIANCE, AND ANY NOTES, DRAWINGS, MAPS, ETC. PERTAINING TO REPAIRS. COPIES OF ALL DOCUMENTATION SHALL BE DISTRIBUTED TO MUNICIPALITIES AND OWNER ON A REGULAR BASIS AS SPECIFIED BY OWNER. SEDIMENTS DEPOSITED IN THE PUBLIC RIGHTS-OF-WAY WILL BE REMOVED IMMEDIATELY. THE TEMPORARY VEGETATION OF BARE SOILS WILL BE CHECKED REGULARLY AND AREAS WHERE IT IS LOST OR DAMAGED WILL BE RESEEDED. AT MINIMUM THE CONTRACTOR OR HIS AGENT SHALL INSPECT ALL BMPS EVERY 14 DAYS AND AFTER SIGNIFICANT PRECIPITATION OR SNOWMELT EVENTS. INSTALLATIONS AND MODIFICATIONS AS REQUIRED BY THE (CITY/TOWN/COUNTY/DISTRICT) WILL BE IMPLEMENTED WITHIN 48 HOURS OF NOTIFICATION. CONTRACTOR SHALL REMOVE TEMPORARY EROSION CONTROL MEASURES AND REPAIR AREAS AS REQUIRED AFTER VEGETATION IS ESTABLISHED AND ACCEPTED BY OWNER AND MUNICIPALITY.

FINAL STABILIZATION AND LONG-TERM STORMWATER QUALITY:

FINAL STABILIZATION IS REACHED WHEN ALL SOIL DISTURBING ACTIVITIES AT THE SITE HAVE BEEN COMPLETED, AND UNIFORM VEGETATIVE COVER HAS BEEN ESTABLISHED WITH A DENSITY OF AT LEAST 70% OR PRE-DISTURBANCE LEVELS OR EQUIVALENT PERMANENT, PHYSICAL EROSION REDUCTION METHODS HAVE BEEN EMPLOYED. FINAL STABILIZATION WILL BE ACHIEVED USING NATIVE SEEDING, PERMANENT BMP'S, AND OTHER METHODS. CONTRACTOR SHALL BE RESPONSIBLE FOR FINAL STABILIZATION REGARDLESS OF ACCEPTANCE BY OWNER OF THE CONTRACTOR ITEM.

Stabilized Staging Area (SSA) SM-6



SSA-1. STABILIZED STAGING AREA

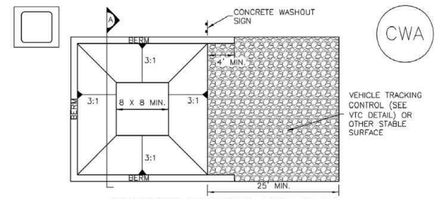
STABILIZED STAGING AREA INSTALLATION NOTES

1. SEE PLAN VIEW FOR
   -LOCATION OF STAGING AREA(S).
   -CONTRACTOR MAY ADJUST LOCATION AND SIZE OF STAGING AREA WITH APPROVAL FROM THE LOCAL JURISDICTION.
2. STABILIZED STAGING AREA SHOULD BE APPROPRIATE FOR THE NEEDS OF THE SITE. OVERSIZING RESULTS IN A LARGER AREA TO STABILIZE FOLLOWING CONSTRUCTION.
3. STAGING AREA SHALL BE STABILIZED PRIOR TO OTHER OPERATIONS ON THE SITE.
4. THE STABILIZED STAGING AREA SHALL CONSIST OF A MINIMUM 3" THICK GRANULAR MATERIAL.
5. UNLESS OTHERWISE SPECIFIED BY LOCAL JURISDICTION, ROCK SHALL CONSIST OF DOT SECT. #703, AASHTO #3 COARSE AGGREGATE OR 6" (MINUS) ROCK.
6. ADDITIONAL PERIMETER BMPs MAY BE REQUIRED INCLUDING BUT NOT LIMITED TO SILT FENCE AND CONSTRUCTION FENCING.

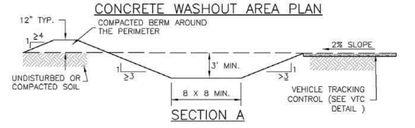
STABILIZED STAGING AREA MAINTENANCE NOTES

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 IF RUTTING OCCURS OR UNDERLYING SUBGRADE BECOMES EXPOSED.

Concrete Washout Area (CWA) MM-1



CONCRETE WASHOUT AREA PLAN



SECTION A

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.

MM-1 Concrete Washout Area (CWA)

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.

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JOSHUA J. MCCARTY
40279
04/06/21

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WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

SWMP NOTES AND EROSION CONTROL DETAILS

SHEET NO.
CE1.3

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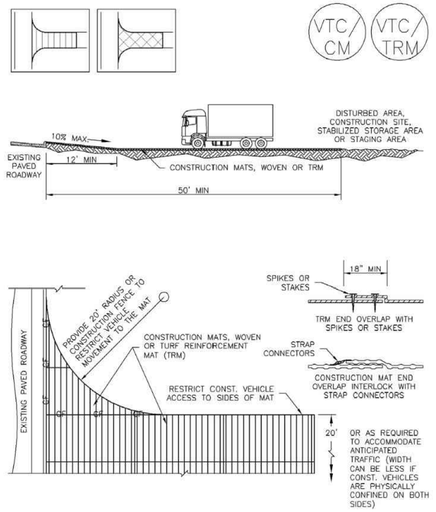
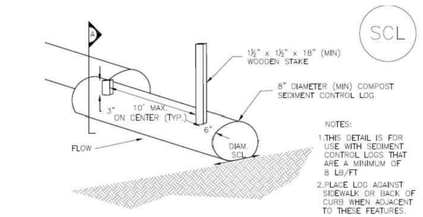
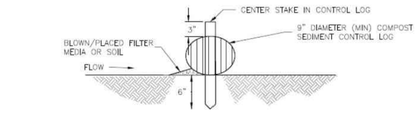


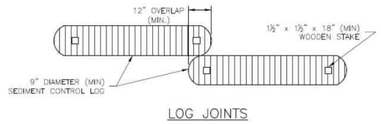
VTC–3. VEHICLE TRACKING CONTROL W/ CONSTRUCTION MAT OR TURF REINFORCEMENT MAT (TRM)



COMPOST SEDIMENT CONTROL LOG (WEIGHTED)

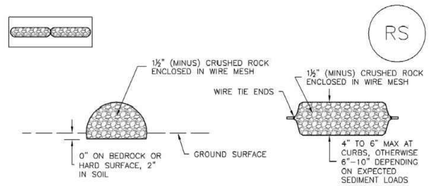


SECTION (A)
COMPOST SEDIMENT CONTROL LOG

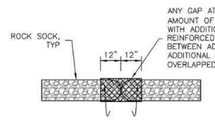


LOG JOINTS

SCL–2. COMPOST SEDIMENT CONTROL LOG (WEIGHTED)



ROCK SOCK SECTION ROCK SOCK PLAN



ROCK SOCK JOINTING

ANY GAP AT JOINT SHALL BE FILLED WITH AN ADEQUATE AMOUNT OF 1½" (MINUS) CRUSHED ROCK AND WRAPPED WITH ADDITIONAL WIRE MESH SECURED TO ENDS OF ROCK REINFORCED SOCK. AS AN ALTERNATIVE TO FILLING JOINTS BETWEEN ADJOINING ROCK SOCKS WITH CRUSHED ROCK AND ADDITIONAL WIRE WRAPPING, ROCK SOCKS CAN BE OVERLAPPED (TYPICALLY 12–INCH OVERLAP) TO AVOID GAPS.

GRADATION TABLE	
SIEVE SIZE	MASS PERCENT PASSING SQUARE MESH SIEVES
	NO. 4
2"	100
1½"	90 – 100
1"	20 – 55
¾"	0 – 15
⅜"	0 – 5
MATCHES SPECIFICATIONS FOR NO. 4 COARSE AGGREGATE FOR CONCRETE PER AASHTO M43. ALL ROCK SHALL BE FRACTURED FACE, ALL SIDES.	

ROCK SOCK INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   –LOCATION(S) OF ROCK SOCKS.
2. CRUSHED ROCK SHALL BE 1½" (MINUS) IN SIZE WITH A FRACTURED FACE (ALL SIDES) AND SHALL COMPLY WITH GRADATION SHOWN ON THIS SHEET (1½" MINUS).
3. WIRE MESH SHALL BE FABRICATED OF 10 GAGE POULTRY MESH, OR EQUIVALENT, WITH A MAXIMUM OPENING OF ½", RECOMMENDED MINIMUM ROLL WIDTH OF 48"
4. WIRE MESH SHALL BE SECURED USING "HOG RINGS" OR WIRE TIES AT 6" CENTERS ALONG ALL JOINTS AND AT 2" CENTERS ON ENDS OF SOCKS.
5. SOME MUNICIPALITIES MAY ALLOW THE USE OF FILTER FABRIC AS AN ALTERNATIVE TO WIRE MESH FOR THE ROCK ENCLOSURE.

RS–1. ROCK SOCK PERIMETER CONTROL

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)

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.
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. COMPOST LOGS THAT ARE 8 LB/FT DO NOT NEED TO BE TRENCHED.
6. THE UPHILL SIDE OF THE SEDIMENT CONTROL LOG SHALL BE BACKFILLED WITH SOIL OR FILTER MATERIAL 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 OR BLOWN IN PLACE.
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. COMPOST LOGS SHOULD BE STAKED 10' ON CENTER.

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.COMPOST FROM COMPOST LOGS MAY BE LEFT IN PLACE AS LONG AS BAGS ARE REMOVED AND THE AREA SEEDED. 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.

ROCK SOCK 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 SOCKS SHALL BE REPLACED IF THEY BECOME HEAVILY SOILED, OR DAMAGED BEYOND REPAIR.
5. SEDIMENT ACCUMULATED UPSTREAM OF ROCK SOCKS 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 ROCK SOCK.
6. ROCK SOCKS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION.
7. WHEN ROCK SOCKS ARE 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, 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 ROCK SOCK INSTALLATION IN THE DENVER METROPOLITAN AREA. THERE ARE MANY OTHER SIMILAR PROPRIETARY PRODUCTS ON THE MARKET. UDFCD NEITHER NOORSES NOR DISCOURAGES USE OF PROPRIETARY PROTECTION PRODUCTS; 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.

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NO.	DATE	DESD	DWN	REVISION DESCRIPTION

COLORADO REGISTERED JOSHUA J. McCRIMMON 40279 04/06/21 PROFESSIONAL ENGINEER

DESIGNED BY:	RAH/MHT
DRAWN BY:	JGJ
CHECKED BY:	JJM
JOB #:	1051.6e
DATE:	APRIL 2021

WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

EROSION CONTROL DETAILS

SHEET NO.
CE1.4

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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 Name	Botanical Name	Growth Season[a]	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[a]	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.

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NO.	DATE	DES'D	DWN	REVISION DESCRIPTION

COLORADO REGISTERED JOSHUA J. MORRISSEY 40279 04/06/21 PROFESSIONAL ENGINEER

DESIGNED BY:	RAH/MHT
DRAWN BY:	JGJ
CHECKED BY:	JJM
JOB #:	1051.6e
DATE:	APRIL 2021

WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

EROSION CONTROL DETAILS

SHEET NO.
CE1.5

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CUT/FILL SUMMARY						
NAME	CUT FACTOR	FILL FACTOR	2D AREA	CUT	FILL	NET
VOLUME	1.00	1.00	27523.04 SQ. FT.	143.18 CU. YD.	6433.99 CU. YD.	6290.81 CU. YD. <FILL>
TOTALS			27523.04 SQ. FT.	143.18 CU. YD.	6433.99 CU. YD.	6290.81 CU. YD. <FILL>

LAKE WOODMOOR

LPS NO. 2

N1461235.75
E3182585.84

N1461221.29
E3182609.03

N1461212.55
E3182571.38

N1461198.09
E3182594.57

RIPRAP SLOPE PROTECTION (9 / CD1.2)

CONC PAD (RE: STRUCT)

100-YEAR FLOODPLAIN BOUNDARY

EXIST PROPERTY LINE

EXIST ACCESS ROAD

EXIST ELECTRIC EQUIPMENT

EXIST PUMP STATION

GRAVEL PAVEMENT (4 / CD1.2)

GRADE BREAK (TYP)

LAKE WOODMOOR DR

7.7H:1V
7.9H:1V
4.2H:1V
3.9H:1V

14.58 ME
14.30 ME
13.83
13.44
13.32 ME
12.52
11.78 ME
11.54
11.25
10.40 ME
10.69
10.97
10.10
09.91
09.58
09.42
09.39
09.25
09.09
08.66 LP
3.37

1.7%
5.1%
3.7%
1.4%
5.6%
6.1%
10.9%
4.9%

EASEMENT AGREEMENT REC. NO. 219086909 (P12)
EASEMENT AGREEMENT REC. NO. 219103807 (P12)
TRACT B (P12)
LOT 1 (P12)
LOT 2 (P12)
LOT 3 (P12)
LOT 4 (P12)
10' PUBLIC UTILITY & DRAINAGE EASEMENT (P12) (TYP.)
5' PUBLIC IMPROVEMENTS & UTILITY EASEMENT (P12) (TYP.)
16' UTILITY EASEMENT (P12)
20' UTILITY EASEMENT BK 2318, PG 100
SANITARY MANHOLE RIM ELEV: 7107.72'
SANITARY MANHOLE RIM ELEV: 7101.62'

20 0 20 40
SCALE IN FEET

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NO.	DATE	DES'D	DWN.	REVISION DESCRIPTION

COLORADO REGISTERED JOSHUA J. MCCRAY 40279 04/06/21 PROFESSIONAL ENGINEER

DESIGNED BY:	KCT
DRAWN BY:	JGJ
CHECKED BY:	JJM
JOB #:	1051.6e
DATE:	APRIL 2021

WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

CIVIL SITE PLAN

SHEET NO.
C1.0

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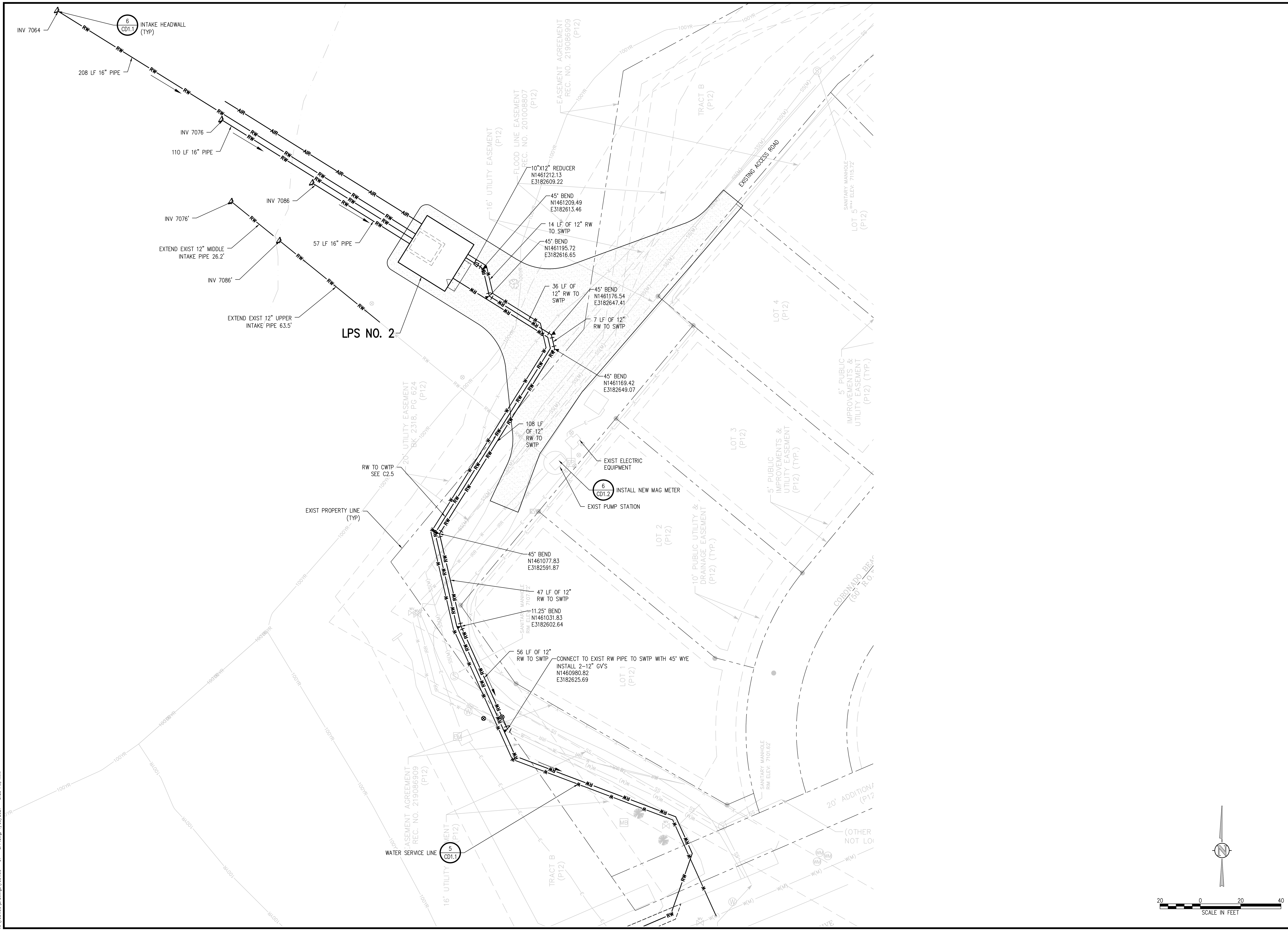

INV 7064
6 CD1.1 INTAKE HEADWALL (TYP)
208 LF 16" PIPE
INV 7076
110 LF 16" PIPE
INV 7086
INV 7076'
EXTEND EXIST 12" MIDDLE INTAKE PIPE 26.2'
57 LF 16" PIPE
INV 7086'
EXTEND EXIST 12" UPPER INTAKE PIPE 63.5'
LPS NO. 2
10"X12" REDUCER N1461212.13 E3182609.22
45° BEND N1461209.49 E3182613.46
14 LF OF 12" RW TO SWTP
45° BEND N1461195.72 E3182616.65
36 LF OF 12" RW TO SWTP
45° BEND N1461176.54 E3182647.41
7 LF OF 12" RW TO SWTP
45° BEND N1461169.42 E3182649.07
108 LF OF 12" RW TO SWTP
EXIST ELECTRIC EQUIPMENT
6 CD1.2 INSTALL NEW MAG METER
EXIST PUMP STATION
RW TO CWTP SEE C2.5
EXIST PROPERTY LINE (TYP)
45° BEND N1461077.83 E3182591.87
47 LF OF 12" RW TO SWTP
11.25° BEND N1461031.83 E3182602.64
56 LF OF 12" RW TO SWTP
CONNECT TO EXIST RW PIPE TO SWTP WITH 45° WYE INSTALL 2-12" GV'S N1460980.82 E3182625.69
WATER SERVICE LINE 5 CD1.1
EXISTING ACCESS ROAD
SCALE IN FEET

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DESIGNED BY:	RAH/MHT
DRAWN BY:	MHT
CHECKED BY:	JJM
JOB #:	1051.6e
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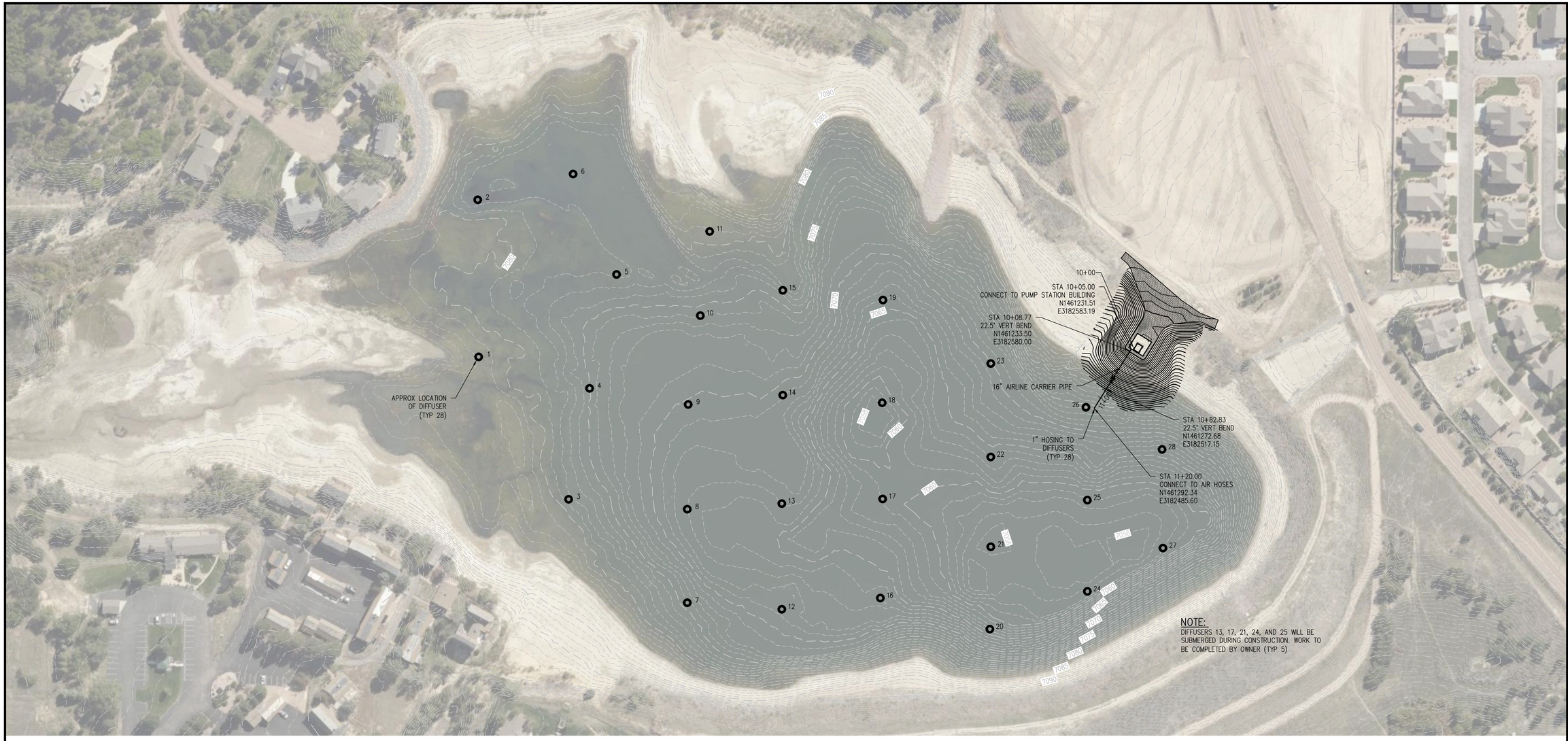
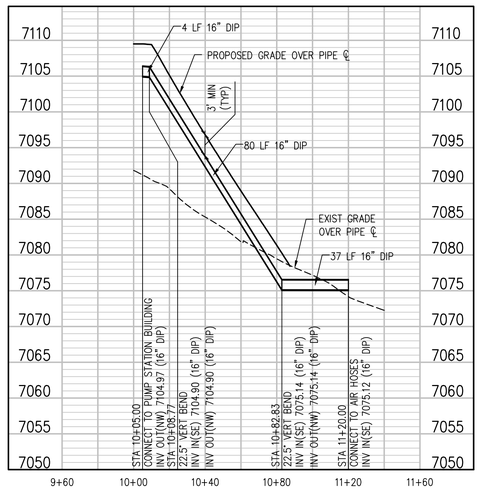
WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

SITE PIPING PLAN

SHEET NO.
C1.1

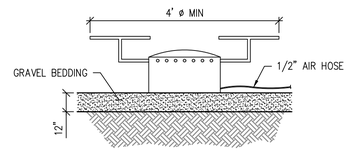


NOTE:
DIFFUSERS 13, 17, 21, 24, AND 25 WILL BE SUBMERGED DURING CONSTRUCTION. WORK TO BE COMPLETED BY OWNER (TYP 5)



AIRLINE CARRIER PIPE PROFILE

SCALE: 1"=40' HORIZ
1"=10' VERT



DIFFUSER BEDDING DETAIL 1
NTS

SCALE IN FEET
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JOSHUA J. MCCLURE
40279
04/06/21
PROFESSIONAL ENGINEER

DESIGNED BY:	RAH/KCT
DRAWN BY:	MHT
CHECKED BY:	JJM
JOB #:	1051.6e
DATE:	APRIL 2021

WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

AERATION SITE PLAN

SHEET NO.
C1.2

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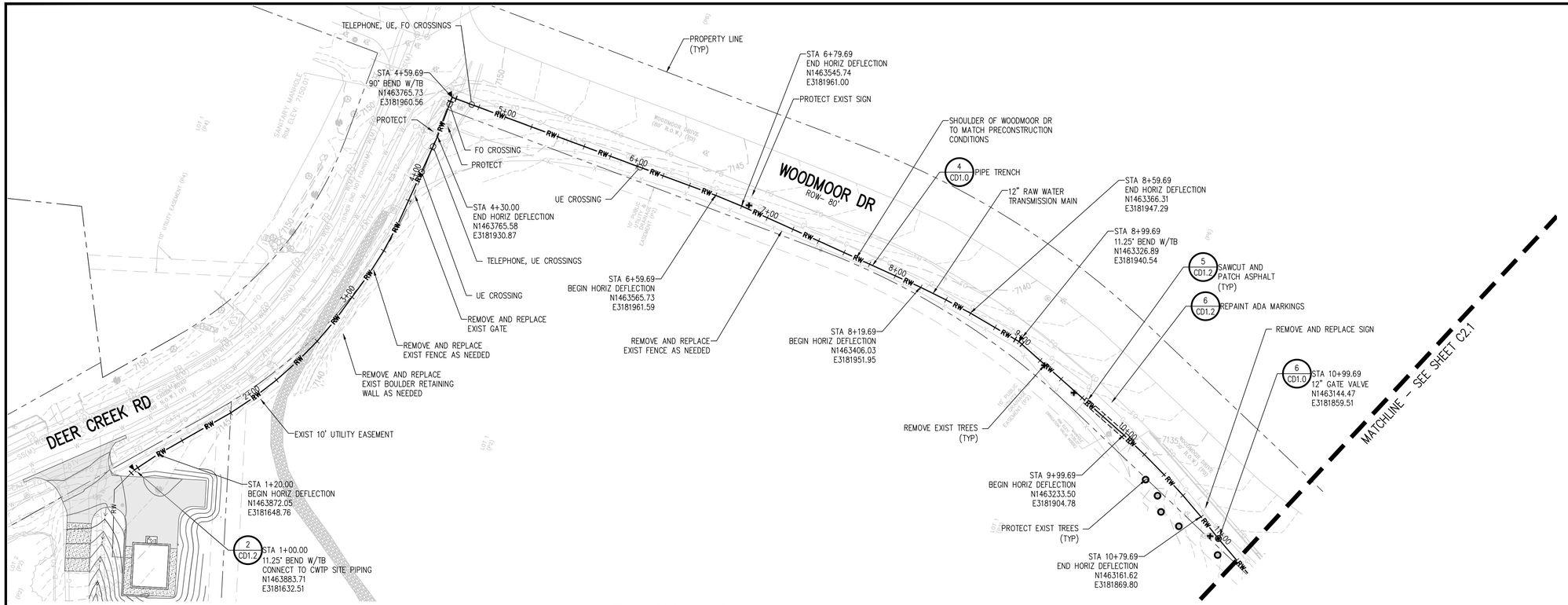
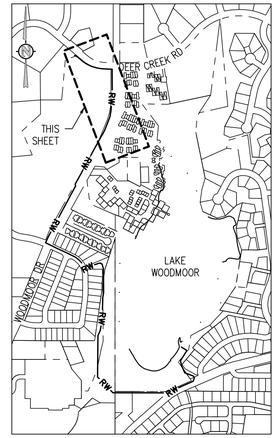


TRANSMISSION MAIN PLAN
SCALE: 1" =40'



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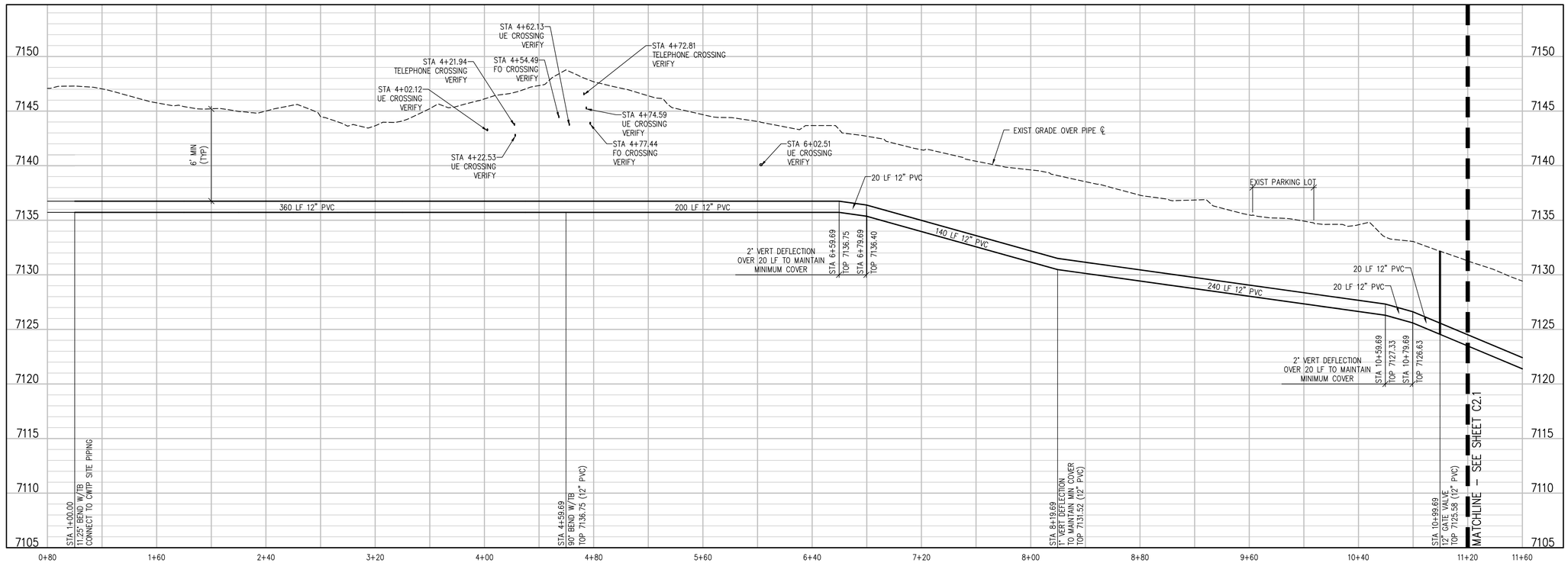

TRANSMISSION MAIN PROFILE
SCALE: 1"=40' HORIZ
1"=5' VERT

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WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

TRANSMISSION MAIN PLAN AND PROFILE

SHEET NO.
C2.0

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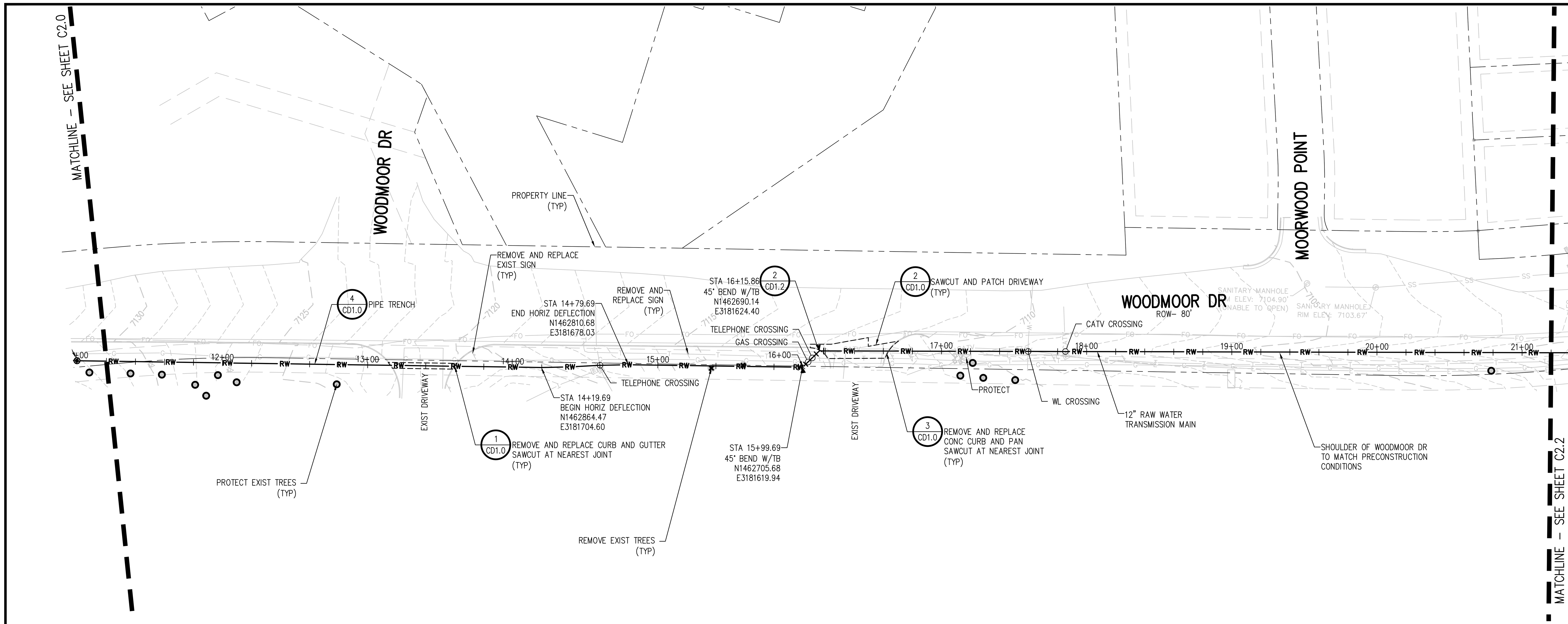

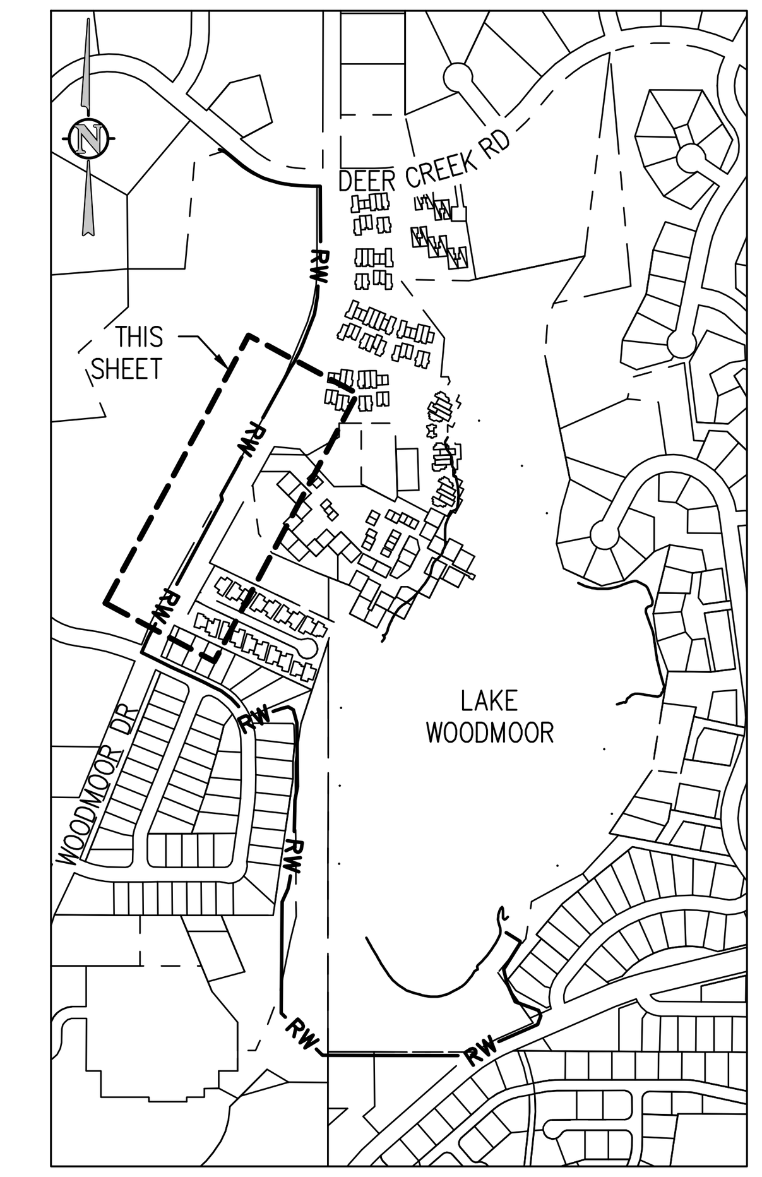

KEY MAP
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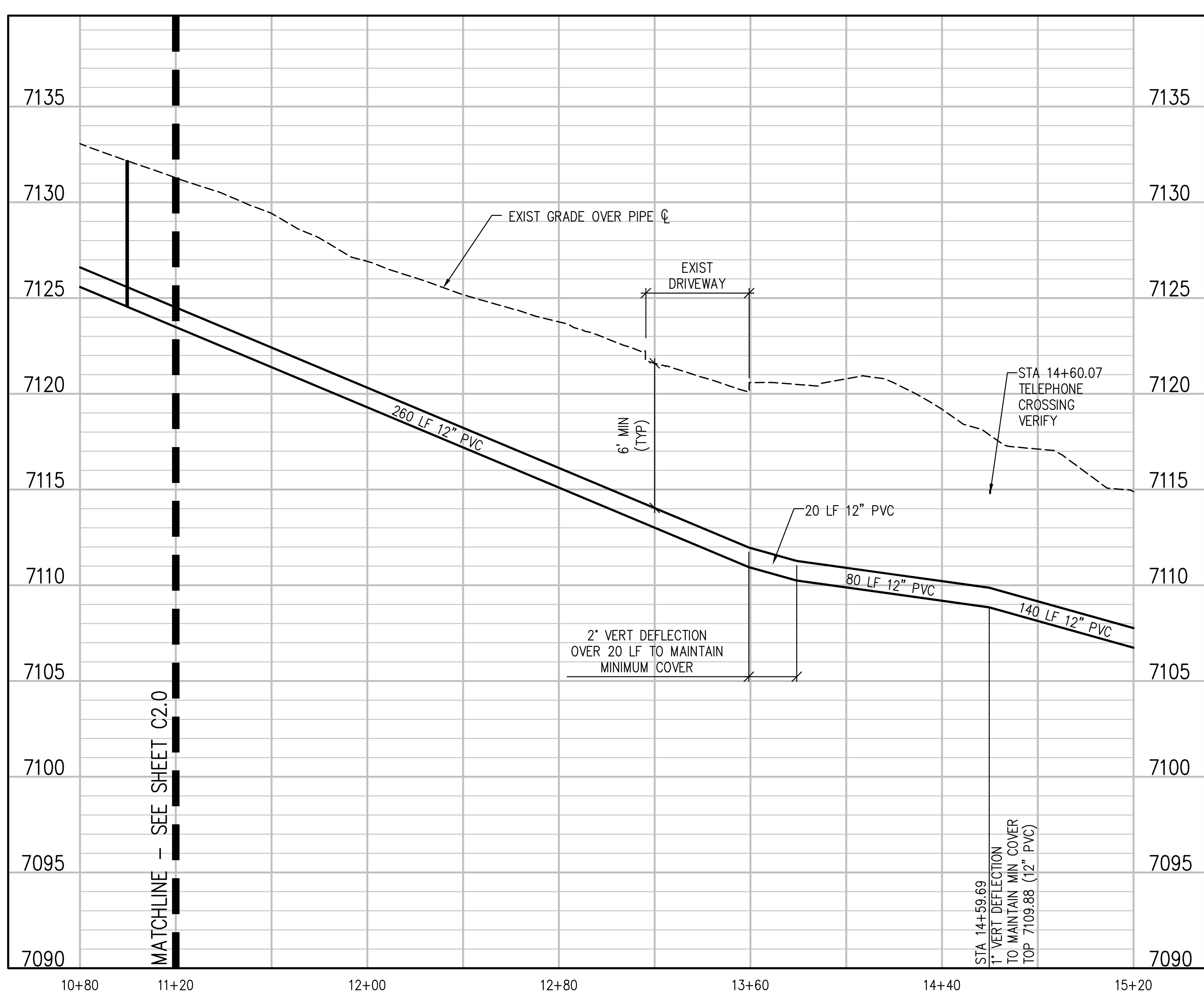
TRANSMISSION MAIN PLAN
SCALE: 1" =40'



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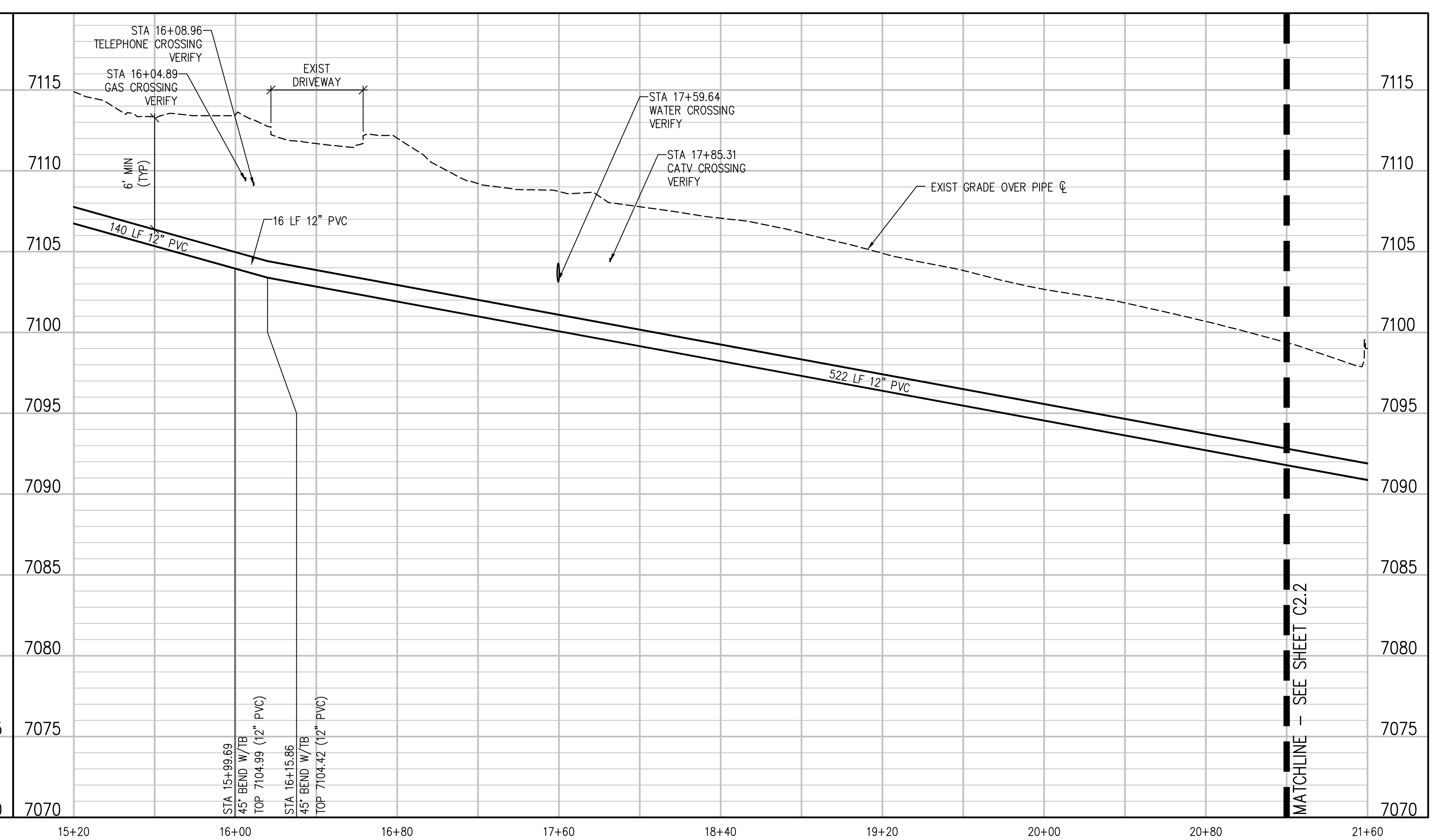

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SCALE: 1"=40' HORIZ
1"=5' VERT

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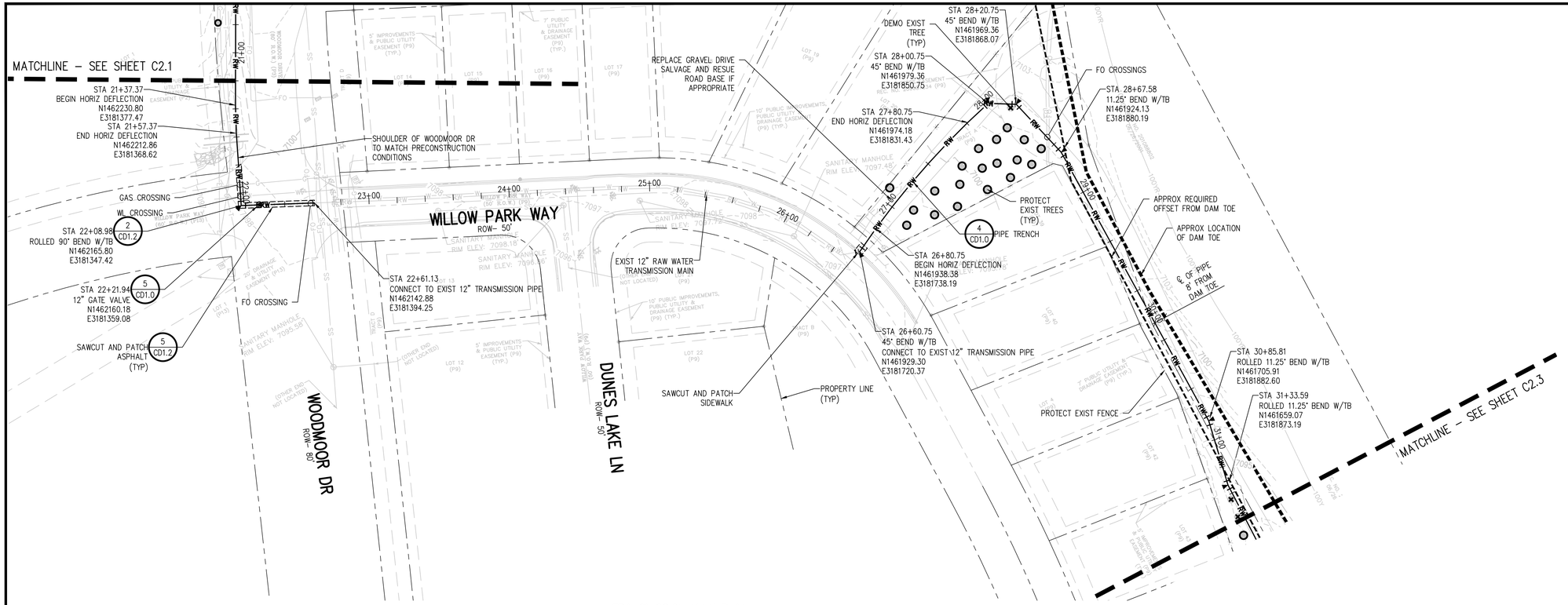
WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

TRANSMISSION MAIN PLAN AND PROFILE

SHEET NO.
C2.1



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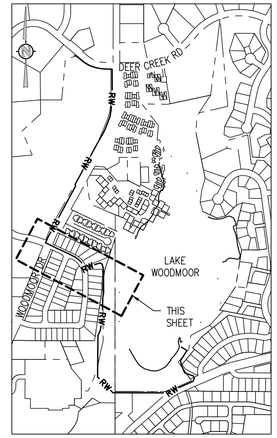

KEY MAP
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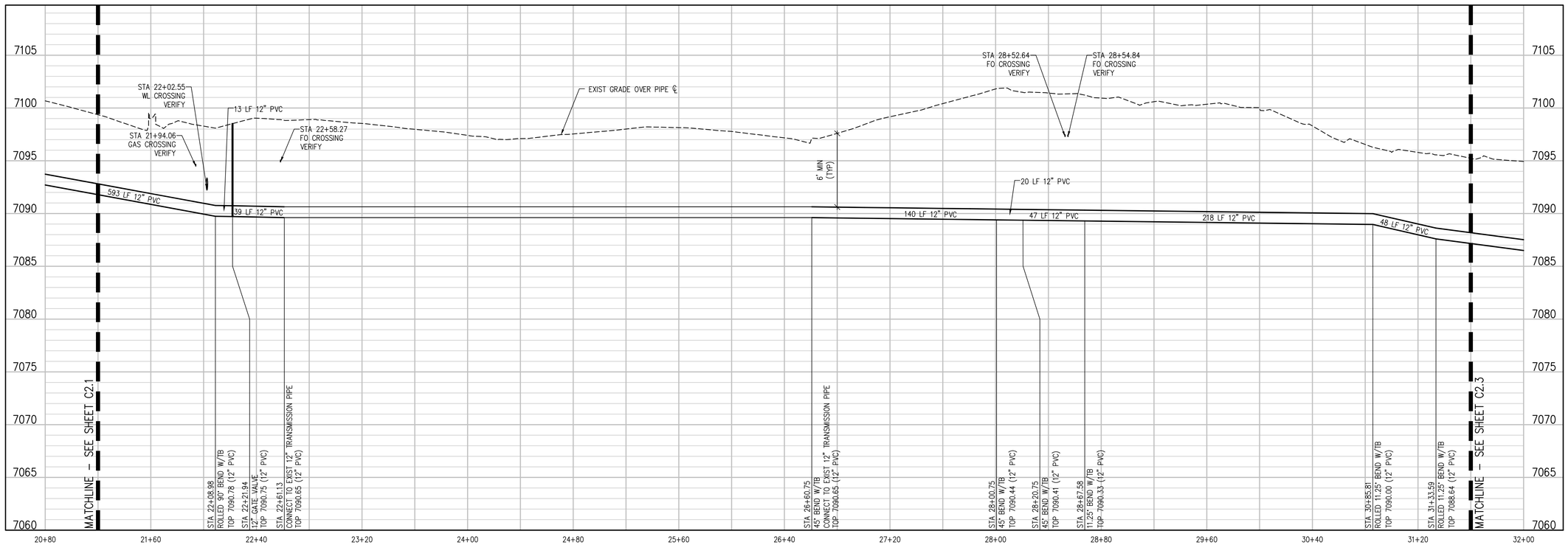

TRANSMISSION MAIN PROFILE
SCALE: 1"=40' HORIZ
1"=5' VERT

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COLORADO REGISTERED JOSHUA J. MCGLOTHEN 40279 PROFESSIONAL ENGINEER
04/06/21

DESIGNED BY:	RAH/MHT
DRAWN BY:	MHT
CHECKED BY:	JJM
JOB #:	1051.6e
DATE:	APRIL 2021

WOODMOOR WSD NO.1
LAKE PUMP STATION NO. 2 AND PIPELINE
EL PASO COUNTY, COLORADO

TRANSMISSION MAIN PLAN AND PROFILE

SHEET NO.
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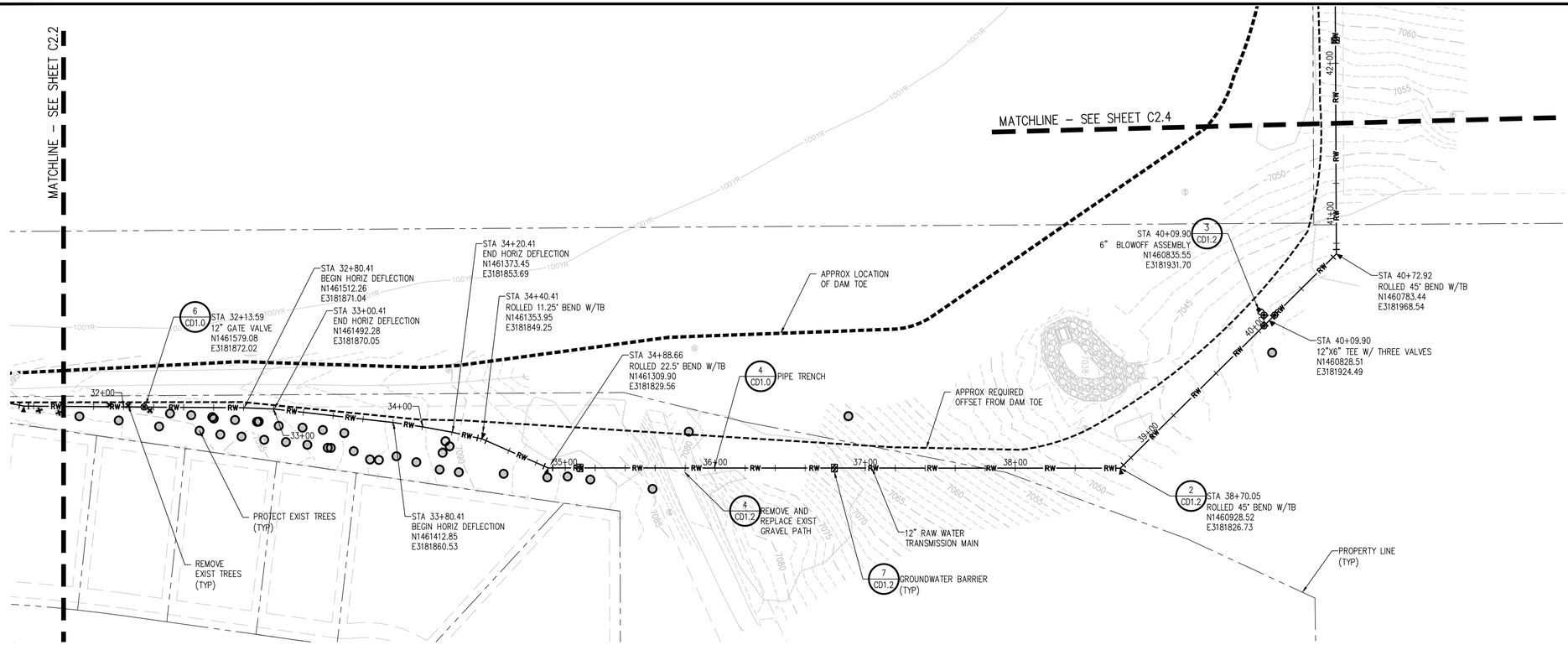

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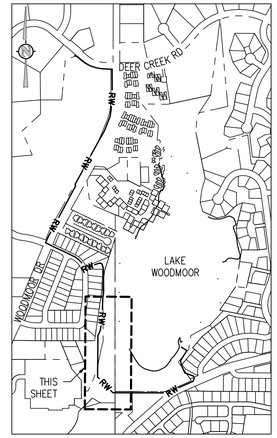

KEY MAP
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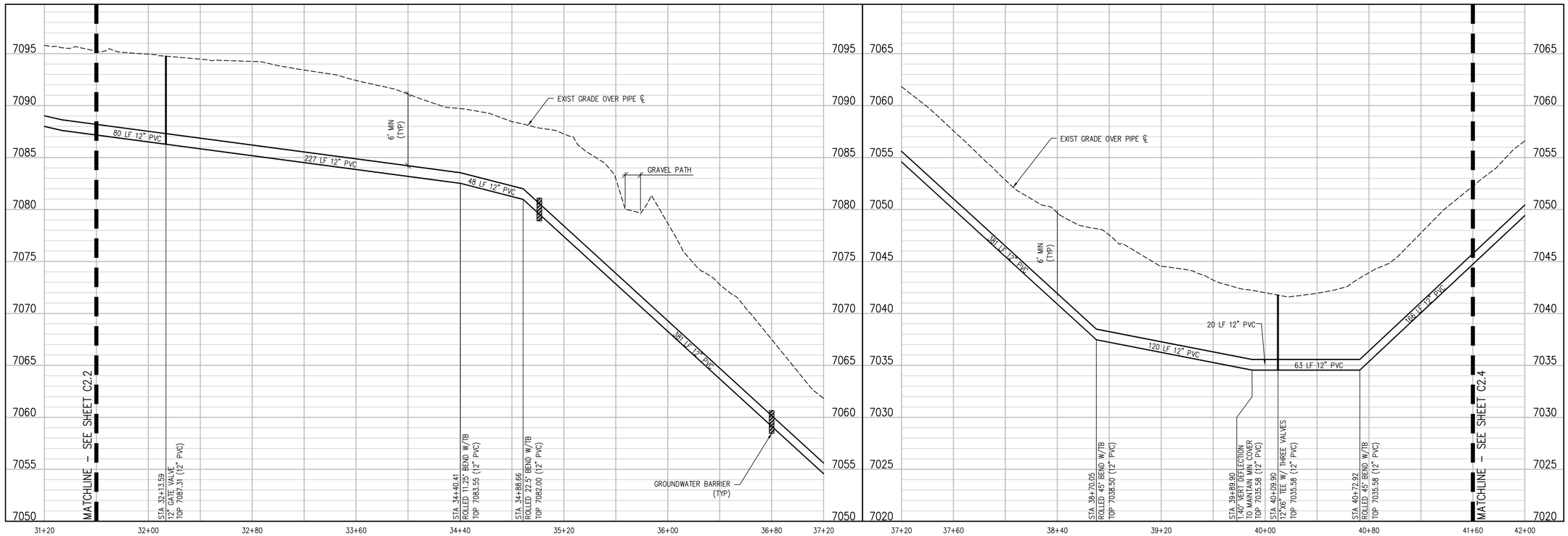
SCALE IN FEET



TRANSMISSION MAIN PROFILE
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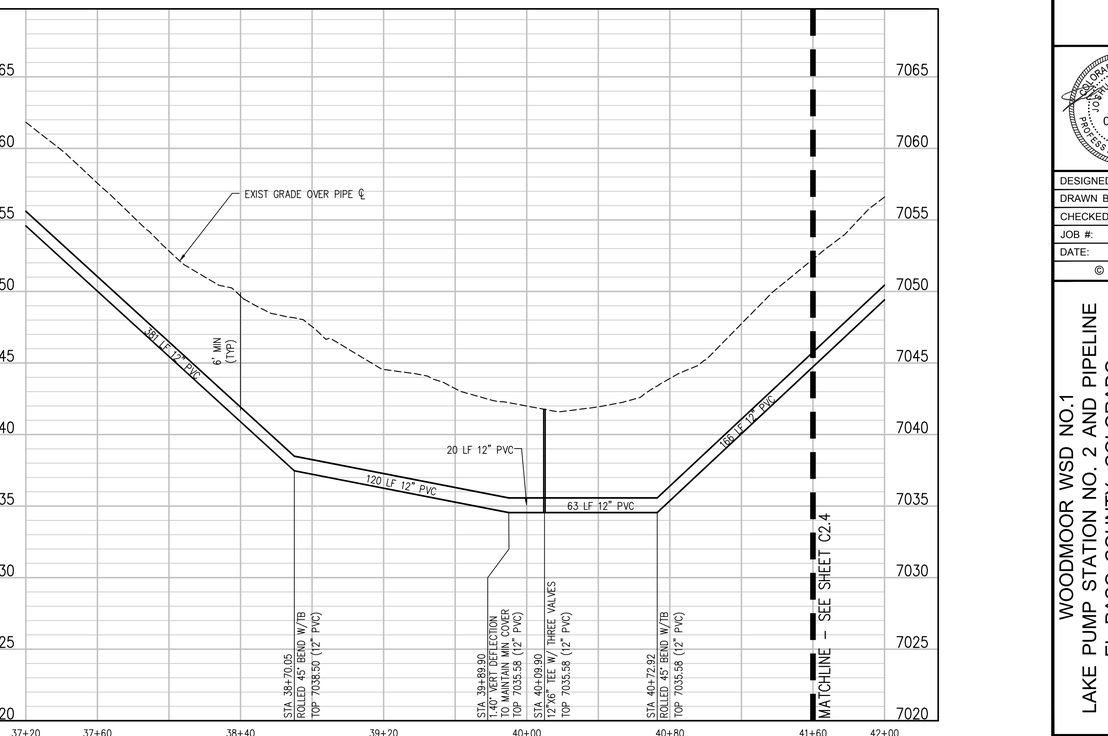

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SCALE: 1"=40' HORIZ
1"=5' VERT

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04/06/21

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DRAWN BY:	MHT
CHECKED BY:	JJM
JOB #:	1051.6e
DATE:	APRIL 2021

WOODMOOR WSD NO.1
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EL PASO COUNTY, COLORADO

TRANSMISSION MAIN PLAN AND PROFILE

SHEET NO.
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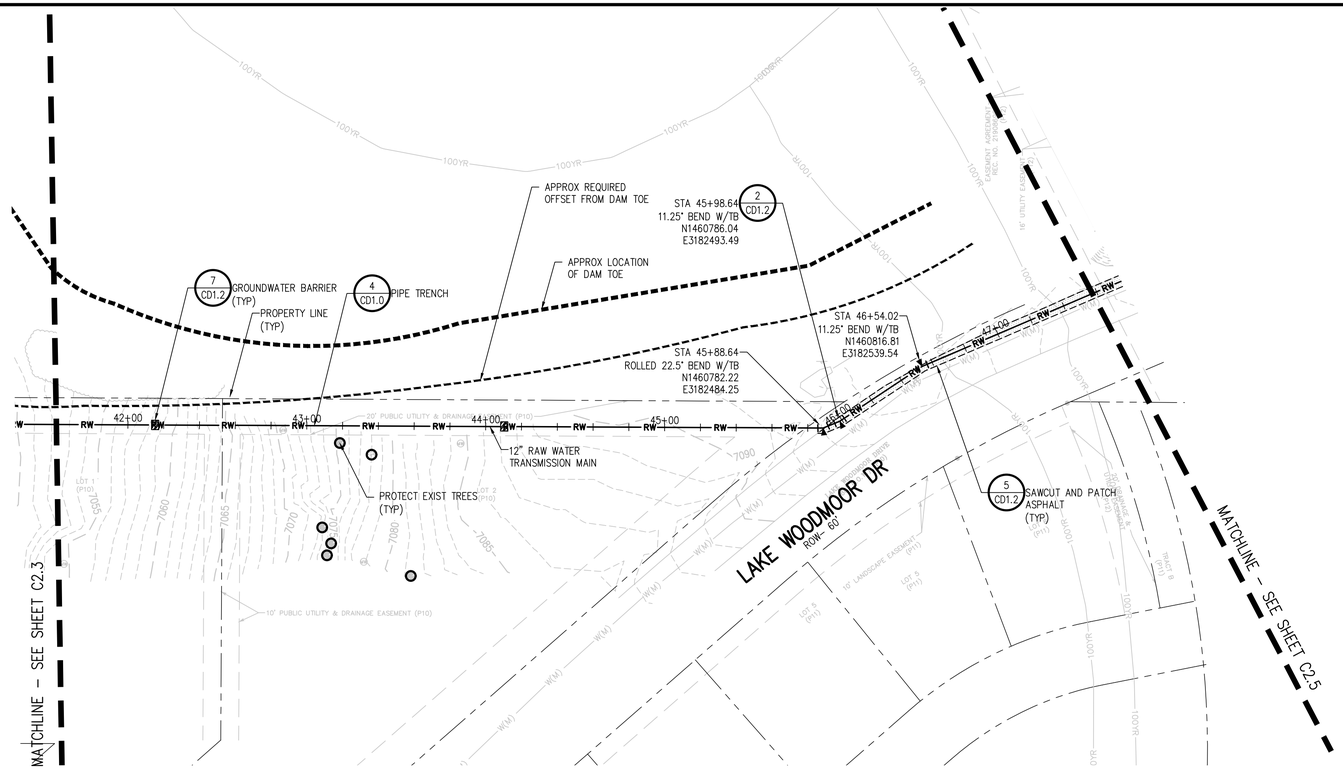

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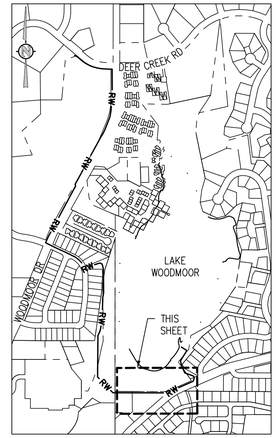

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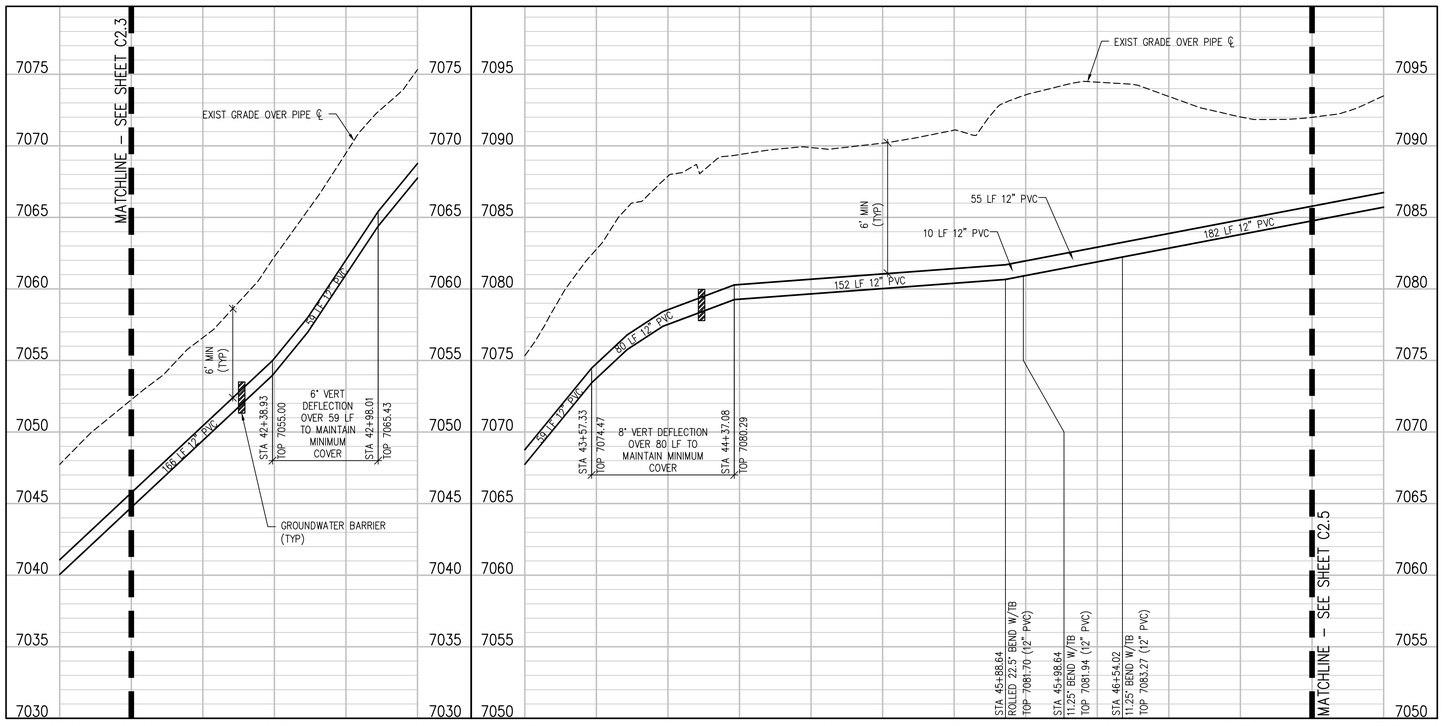

TRANSMISSION MAIN PROFILE
SCALE: 1"=40' HORIZ
1"=5' VERT

TRANSMISSION MAIN PROFILE
SCALE: 1"=40' HORIZ
1"=5' VERT

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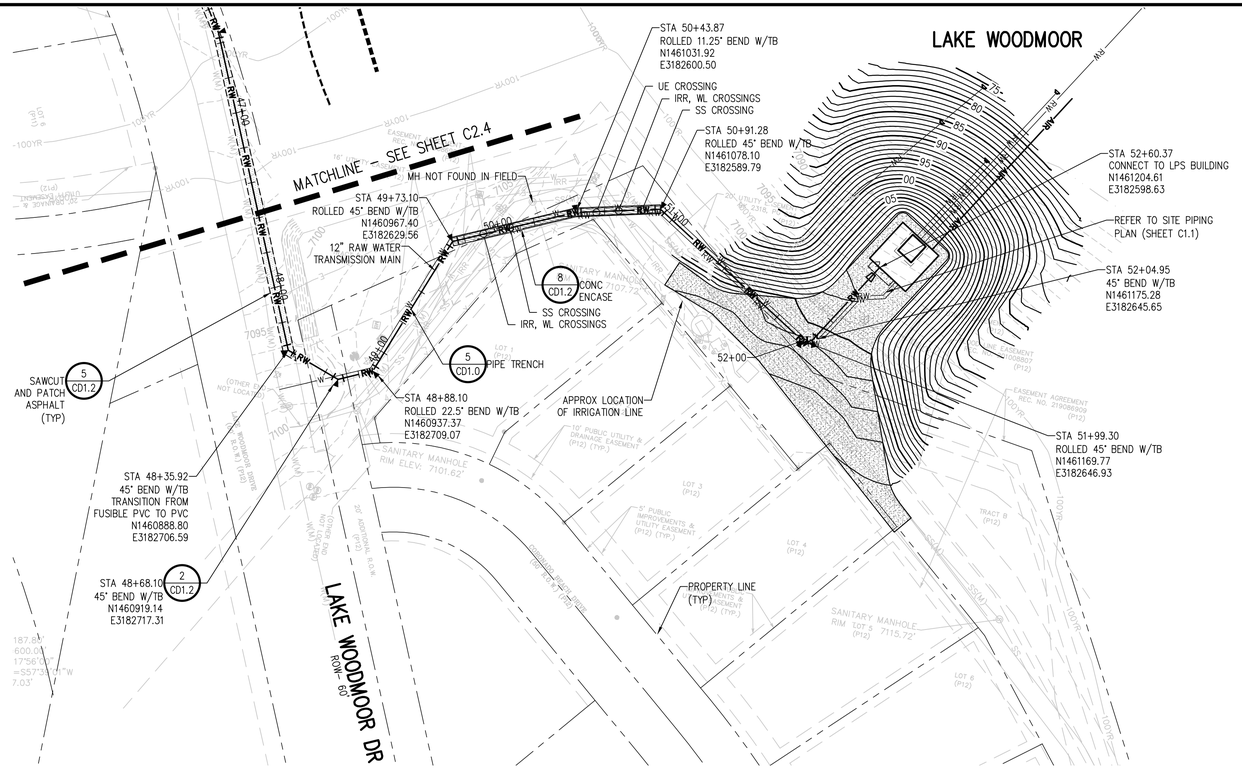
EL PASO COUNTY, COLORADO

TRANSMISSION MAIN PLAN AND PROFILE

SHEET NO.
C2.4



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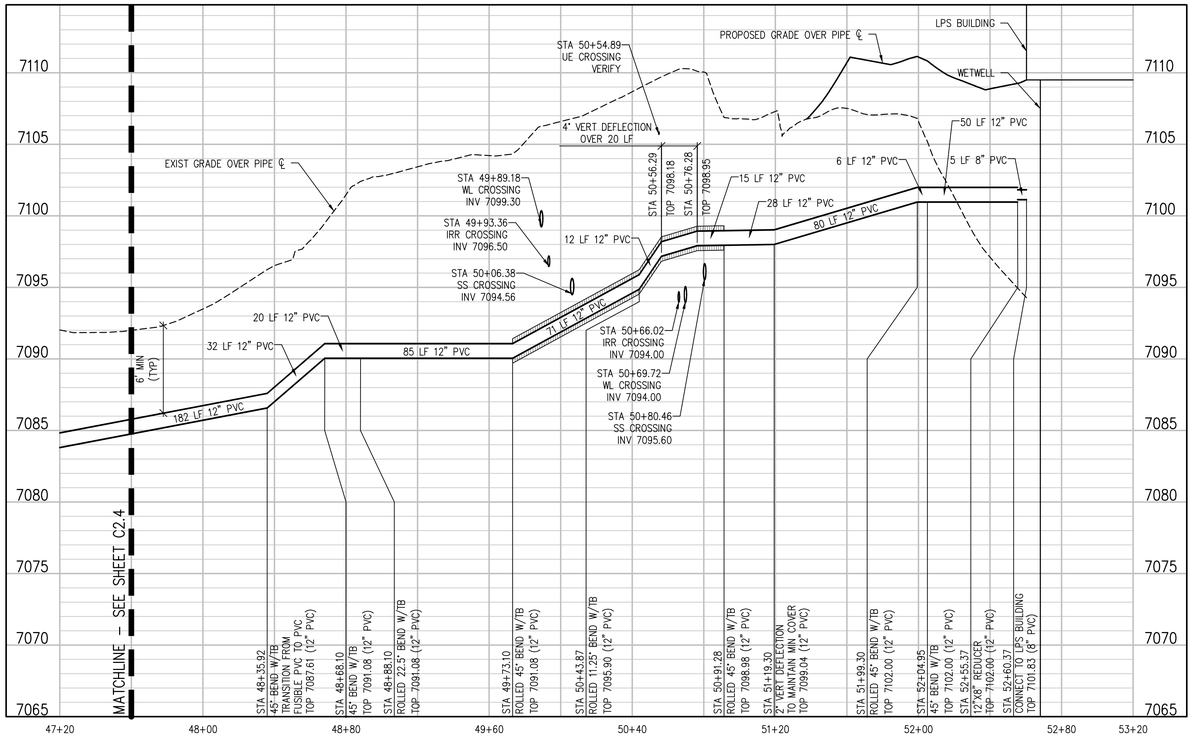

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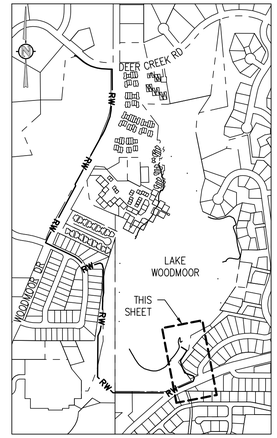

KEY MAP
NTS

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SCALE IN FEET

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WOODMOOR WSD NO.1
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EL PASO COUNTY, COLORADO

TRANSMISSION MAIN PLAN AND PROFILE

SHEET NO.
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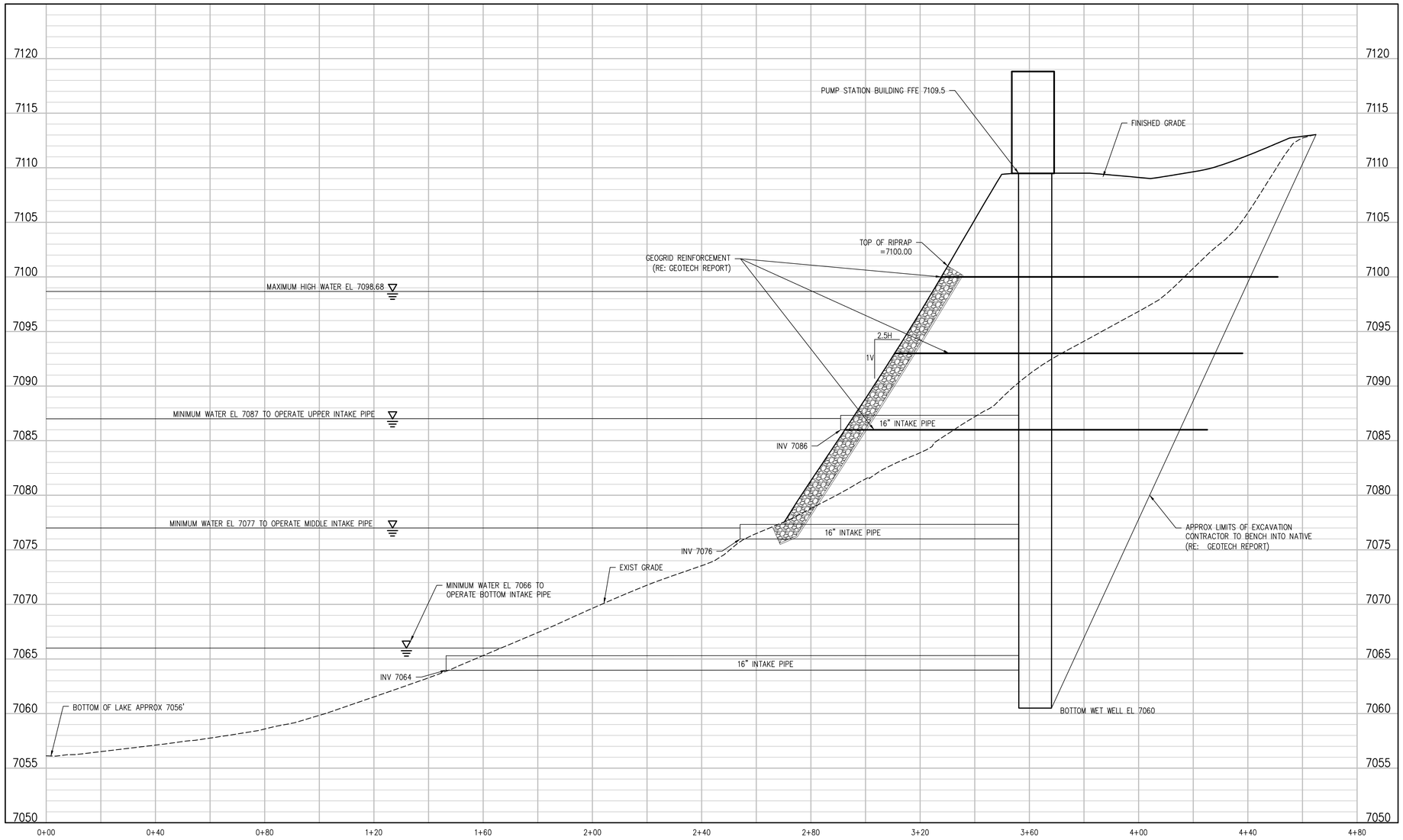

INTAKE PIPE PROFILE

SCALE: 1"=20' HORIZ
1"=5' VERT

20 0 20 40
SCALE IN FEET

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DESIGNED BY:	KCT
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EL PASO COUNTY, COLORADO

INTAKE PIPING PROFILE

SHEET NO.
C2.6

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SECTION 02370

EROSION AND SEDIMENTATION CONTROL

PART 1 GENERAL

1.1 SECTION INCLUDES

A. This work consists of temporary measures needed to control erosion and water pollution. These temporary measures will include, but not be limited to, berms, dikes, dams, sediment basins, fiber mats, netting, gravel, mulches, grasses, slope drains, and other erosion control devices or methods. These temporary measures shall be installed at the locations where needed to control erosion and water pollution during the construction of the project and during site restoration, and as directed by ENGINEER, and as shown on the drawings.

B. The Erosion Control Plan presented in the drawings serves as a minimum for the requirements of erosion control during construction. Contractor has the ultimate responsibility for providing adequate erosion control and water quality throughout the duration of the project. Therefore, if the provided plan is not working sufficiently to protect the project areas, then Contractor shall provide additional measures as required to obtain the required protection.

1.2 RELATED SECTIONS

A. Section 01500 – Construction Facilities and Temporary Controls

B. Section 02220 – Demolition

C. Section 02300 – Earthwork

D. Section 02750 – Rigid Paving

E. Section 02950 – Seeding

1.3 REFERENCES AND STANDARDS

A. CDOT – Colorado Department of Transportation

B. UDFCD – Urban Drainage and Flood Control District

C. CDPHE – Colorado Department of Public Health and Environment

1.4 SUBMITTALS

A. Submit under provisions of Division One specifications.

B. Submit the following information:
   1. Erosion Control Plan,
   2. Construction schedule for Erosion Control per Article Scheduling,
   3. Sequencing Plan per Article Scheduling,
   4. All applicable permits for Erosion Control.

C. Product data: Submit on all products or materials supplied herein.

1.5 REGULATORY REQUIREMENTS

A. Obtain and comply with all requirements of El Paso County, Woodmoor Water & Sanitation District, and CDPHE Stormwater and/or Groundwater Discharge Permits, as required.

B. 401 Construction Dewatering Industrial Wastewater Permit (Construction Dewatering Permit 401):
   1. Contractor shall apply for and obtain a Construction Dewatering Permit 401 from the Colorado Department of Public Health and Environment.
   2. All costs for this permit shall be the responsibility of Contractor.
   3. This permit requires that specific actions be performed at designated times.
   4. Contractor is legally obligated to comply with all terms and conditions of the permit including testing for effluent limitations.
   5. Contractor shall allow the Colorado Department of Public Health and Environment or other representatives to enter the site to test for compliance with the permit.
   6. Non-compliance with the permit can result in stoppage of all work.

C. In the event of conflict between these requirements and erosion and pollution control laws, rules, or regulations of other Federal, State, or local agencies, the more restrictive laws, rules, or regulations shall apply.

1.6 SCHEDULING

A. Sequencing Plan:
   1. Contractor shall submit a sequencing plan for approval for erosion control in conformance with Contractor's overall Construction Plan for approval by El Paso County, Owner.
   2. Changes to the Erosion Control Sequencing Plan may be considered by El Paso County, Owner only if presented in writing by the Contractor.

B. Temporary Erosion Control:
   1. When so indicated in the Contract Documents, or when directed by El Paso County, Owner. Contractor shall prepare construction schedules for accomplishing temporary erosion control work including all maintenance procedures.
   2. These schedules shall be applicable to clearing and grubbing, grading, structural work, construction, etc.

C. Contractor shall submit for acceptance the proposed method of erosion control on haul roads and borrow pits and a plan for disposal of waste material.

D. Contractor shall be required to incorporate all permanent erosion control features into the project at the earliest practicable time as outlined in the accepted schedule. Temporary erosion control measures shall then be used to correct conditions that develop during construction.

E. Work shall not be started until the erosion control schedules and methods of operations have been accepted.

PART 2 PRODUCTS

2.1 MATERIALS

A. Comply with all applicable municipal or local Municipal Separate Storm Sewer System (MS4) requirements.

B. All materials shall be submitted for approval prior to installation.

C. Natural or biodegradable materials shall be reasonably clean, free of deleterious materials, and certified weed free. Materials may include, but are not limited to, hay bales, straw, fiber mats, fiber netting, wood cellulose, fiber fabric, gravel.

D. Grass Seed:
   1. Temporary grass cover (if required) shall be a quick growing species, suitable to the area, in accordance with local criteria and permit requirements, which will provide temporary cover, and not compete with the grasses sown for permanent cover.
   2. All grass seed shall be approved by El Paso County, Owner and in accordance with local regulations prior to installation.

E. Fertilizer and soil conditioners shall be approved by El Paso County, Owner and in accordance with local regulations prior to installation.

PART 3 EXECUTION

3.1 GENERAL

A. All temporary and permanent erosion and sediment control practices will be maintained and repaired as needed to ensure continued performance of their intended function.

B. El Paso County, Owner will monitor Contractor's erosion control methods. If the overall function and intent of erosion control is not being met, El Paso County, Owner will require Contractor to provide additional measures as required to obtain the desired results.

C. The erosion control features installed by Contractor shall be adequately maintained by Contractor until the project is accepted.

3.2 PROTECTION OF ADJACENT PROPERITES

A. Properties adjacent to the site of a land disturbance shall be protected from sediment deposition.

B. In addition to the erosion control measures required on the drawings, perimeter controls may be required if damage to adjacent properties is likely, and may include, but is not limited to:
   1. Vegetated buffer strip around the lower perimeter of the land disturbance.
      a. Vegetated buffer strips may be used only where runoff in sheet flow is expected and should be at least twenty (20) feet in width.
   2. Sediment barriers such as straw bales, erosion logs, and silt fences.
   3. Sediment basins and porous landscape detention ponds.
   4. Combination of above measures.

3.3 CONSTRUCTION

A. Stabilization of Disturbed Areas:
   1. Temporary sediment control measures shall be established within five (5) days from time of exposure or disturbance.
   2. Permanent erosion protection measures shall be stablished within five (5) days after final grading of areas.

B. Stabilization of Sediment and Erosion Control Measures:
   1. Sediment barriers, perimeter dikes, and other measures intended to either trap sediment or prevent runoff from flowing over disturbed areas shall be constructed as a first step in grading and be made functional before land disturbance takes place.
   2. Earthen structures such as dams, dikes, and diversions shall be stabilized within five (5) days of installation.
   3. Stormwater outlets shall also be stabilized prior to any upstream land disturbing activities.

C. Stabilization of Waterways and Outlets:
   1. All onsite stormwater conveyance channels used by Contractor for temporary erosion control purposes shall be designed and constructed with adequate capacity and protection to prevent erosion during storm and runoff events.
   2. Stabilization adequate to prevent erosion shall also be provided at the outlets of all pipes and channels.

D. Storm Sewer Inlet Protection: All storm sewer inlets which are made operable during construction or which drain stormwater runoff from a construction site shall be protected from sediment deposition by the use of filters.

E. Construction Access Routes:

1. Wherever construction vehicles enter or leave a construction site, a Stabilized Construction Entrance is required.
2. Where sediment is transported onto a public road surface, the roads shall be cleaned thoroughly at the end of each day.
3. Sediment shall be removed from roads by shoveling or sweeping and be transported to a sediment controlled disposal area.
4. Street washing shall be allowed only after sediment is removed in the manner described above.

3.4 DISPOSITION OF TEMPORARY MEASURES

A. All temporary erosion and sediment control measures shall be disposed of within thirty (30) days after final site stabilization is achieved or after the temporary measures are no longer needed as determined by El Paso County, Owner.

B. Trapped sediment and other disturbed soil areas resulting from the disposition of temporary measures shall be permanently stabilized to prevent further erosion.

C. Substantial Completion of Erosion Control Measures:
   1. At the time specified in the Contract Documents, and subject to compliance with specified materials and installation requirements, Contractor shall receive a Substantial Completion Certificate for temporary erosion control measures.
   2. Maintenance of Erosion Control Measures after Substantial Completion: Contractor shall be responsible for maintaining temporary erosion control measures as specified in the drawings and Contract Documents until such time as work has been accepted by El Paso County, Owner and as specified in Division 1 for Closeout Procedures.

END OF SECTION

SECTION 02920

SEEDING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Soil preparation

B. Fertilization

C. Seeding methods

D. Areas to be reseeded

E. Seed Mix

F. Maintenance

G. Seed protection and slope stabilization

1.2 RELATED SECTIONS

A. Section 01500 – Construction Facilities and Temporary Controls

B. Section 02300 – Earthwork

C. Section 02370 – Erosion and Sedimentation Control

1.3 REFERENCES

A. Federal Specification (FS) O-F-241 - Fertilizers, Mixed, Commercial

B. American Association of Nurserymen - Standardized Plant Names

C. Association of Official Seed Analysts (AOSA)

D. Colorado Department of Agriculture (CDA) Seed Act

E. Colorado Department of Transportation (CDOT) Construction Specifications

1.4 SUBMITTALS

A. Submit under Division One Specifications for products related to seeding work including but not limited to seed mixes, mulches, composts, tackifiers, fertilizers and herbicides.

B. Product Data:

1. Certified Live Seed analyses not more than 6 months old by a recognized laboratory of seed testing for grass mixtures including percent of live seed (PLS), germination, all crop seeds in excess of 1 percent, inerts and weeds
2. Manufactures guaranteed chemical analysis, name, trade name, trademark and conformance to state and local laws of all fertilizers and herbicides

1.5 QUALITY ASSURANCE

A. Provide seed mixture in containers showing percentage of seed mix, year of production, net weight, date of packaging, and location of packaging

B. Provide a certificate of the PLS test of the grass seed intended for the project, certifying that the seed furnished is from a lot that has been tested by a recognized laboratory within the last 6 months

C. All brands furnished shall be free from such noxious seeds as Russian or Canadian Thistle, Coarse Fescue, European Birdweed, Johnson Grass, Leafy Spurge, field bindweed, kochia, or any state-listed or [CDOT-listed] noxious weed species

D. Any materials that have become wet, moldy or otherwise damaged in transit or in storage will not be used

1.6 QUALIFICATIONS

A. Applicator: Company specializing in performing work of this section with landscaping license from State of Colorado
   1. Experienced with type, elevation, topography and scale of work specified
   2. Adequate equipment and personnel to perform work

1.7 REGULATORY REQUIREMENTS

A. Comply with codes and ordinances of local regulatory agencies for fertilizer and herbicide composition and regulations of State of Colorado and El Paso County.

B. Provide certificate of compliance from authority having jurisdiction indicating approval of seed mixture

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect and handle products to site under provisions of Division One specifications

B. All materials and products will remain in original manufacturers shipping bags or containers until they are used. All material or products will be stored in a manner to prevent them from coming into contact with water or other contaminating substance and in a manner that product effectiveness will not be impaired

C. Deliver grass seed mixture in sealed containers. Seed in damaged packaging is not acceptable

D. Commercial fertilizer or commercial herbicide: mixed in original bags or containers of the manufacturer, showing weight, chemical analysis and manufacturer name. Store in such a manner such that product effectiveness will not be impaired

1.9 ENVIRONMENTAL REQUIREMENTS

A. Do not prepare or seed frozen soils

B. Perform seeding and planting only after preceding work establishing final ground surface is completed

C. Conduct minimum of two (2) soil tests to confirm fertilizer type and application rates

1.10 MAINTENANCE SERVICE

A. Maintain seeded areas immediately after placement until grass is well established and exhibits vigorous growing condition

1.11 WARRANTY

A. All plant material and work accomplished under this section shall be guaranteed to provide a uniform stand of grass acceptable to the Owner at the end of a one (1) year time period from the completion of the Seeding and Erosion Control work

PART 2 PRODUCTS

2.1 SEED

A. In conformance with State and Federal regulations and subject to the testing provisions of the Associate of Official Seed Analysts (AOSA)

B. Seed Suppliers: Licensed Seed Dealer with Colorado Department of Agriculture

C. Provide the latest crop available in accordance with Colorado Department of Agriculture Seed Laws, Chapter 35, Article 27

D. Compensate for percentage of purity and germination by furnishing sufficient additional seed to equal the specified pure live seed product. The formula for determining the quantity of pure live seed (PLS) is as follows:

Pounds of Seed (Bulk) x Purity x Germination = Pounds of Pure Live Seed (PLS)

2.2 SEED MIX

A. Permanent seed mixes per tables below:

1. Permanent Upland Area Seed Mix (UDFCD Table A-2, recommended for sandy soil)

Common Name	Scientific Name	Growth Season	Growth Form	% Mix	Lbs/Ac (PLS[1])
Grasses					
Switchgrass	*Panicum virgatum*	Warm	Sod/Bunch	15	2.3
Prairie sandreed	*Calamovilfa longifolia*	Warm	Sod	10	2.2
Sideoats grama	*Bouteloua curtipendula*	Warm	Sod	10	3.1
Blue grama	*Bouteloua gracilis*	Warm	Sod	10	0.7
Indian ricegrass	*Oryzopsis hymenoides*	Cool	Bunch	10	4.3
Western wheatgrass	*Pascopyrum smithii*	Cool	Sod	10	5.5
Little bluestem	*Schizachyrium scoparium*	Warm	Bunch	10	2.3
Sand dropseed	*Sporobolus cryptandrus*	Warm	Bunch	10	0.1
Green needlegrass	*Stipa viridula*	Cool	Bunch	10	3.3
Herbaceous/Wildflowers					
Pasture sage	*Artemisia frigida*			1	0.1
Blanket flower	*Gaillardia aristata*			2	0.9
Tansy aster	*Maceranthera tanacetifolia*			2	0.2
TOTAL PLS POUNDS/ACRE				**100**	**25**

[1]PLS = Pure Live Seed – If broadcast seeding, double the rate

B. Temporary native seed mixes per tables below:

1. Upland Area Temporary Seed Mix (UDFCD Table A-11, recommended for sandy soil)

Common Name	Scientific Name	Growth Season	Growth Form	% Mix	Lbs/Ac (PLS[1])
Sand lovegrass	*Eragrostis trichodes*	Warm	Bunch	20	0.5
Sand bluestem	*Andropogon hallii*	Warm	Sod	20	7.1
Prairie sandreed	*Calamovilfa longifolia*	Warm	Sod	15	2.2
Sand dropseed	*Sporobolus cryptandrus*	Warm	Bunch	15	0.1
Needle and Thread	*Hesperostipa comata spp. comata*	Cool	Bunch	15	5.2
Red three-awn	*Aristida purpurea var. longiseta*	Warm	Bunch	15	2
TOTAL PLS POUNDS/ACRE				**100**	**17.1**

[1]PLS = Pure Live Seed – If broadcast seeding, double the rate

2.3 SOIL MATERIALS

A. Select onsite topsoil: Earth material of loose friable clay loam reasonably free of admixtures of subsoil, refuse stumps, roots, rocks, brush, weeds or other material which can be detrimental to the proper development of site revegetation

2.4 ACCESSORIES

A. Soil Additives (Fertilizer)
   1. Dry fertilizers: Primary element composition by weight of 6-10-5
      a. Nitrogen (N) six (6%) percent of which fifty (50%) per-cent inorganic, phosphoric acid (P_2O_5) ten (10%) percent, and potash (K_2O) five (5%) percent
   2. Commercial fertilizer: Primary element composition by weight of 18-46-0
      a. Nitrogen, eighteen (18%) percent, of which fifty (50%) percent is organic, and phosphoric acid (P_20_5), forty-six (46%) percent
      b. These elements may be organic, inorganic, or a combination and shall be available according to the methods adopted by the Association of Official Chemists
   3. Dry, pelletized or granular, uniform in composition and a free flowing product. Do not use material which has caked, segregated, exceeded the expiration date of application, or be otherwise damaged
   4. Thoroughly mixed by the manufacturer. Clearly identify the contents of each container. Do not use materials and containers previously opened, exceeding the expiration date for application or otherwise damaged

B. Water: Clean, fresh and free of substances or matter which could inhibit vigorous growth of grass

C. Mulching Material: Straw or onsite grasses from grubbing operation, dry, free from foreign matter detrimental to plant life

PART 3 EXECUTION

3.1 GENERAL

A. Seed all areas disturbed by construction, including all areas along the roadside ditches

B. Pattern for seeding and fertilization as required by field conditions. In no case shall revegetation occur within 30 days of the application of any chemical weed control substance

C. Engineer to review grading prior to seeding

3.2 SOIL PREPARATION

A. Uniformly place and spread topsoil removed during grubbing and stored on site. Provide minimum thickness of 4 inches to meet finished grade. Key topsoil to the underlying and surrounding material by the use of harrows, rollers or other equipment suitable for the purpose

B. Apply water to the topsoil for compaction purposes in a fine spray by nozzles in such a manner that it will not wash or erode the newly placed soil

C. Exercise care during soil preparation on all embankments so as not to disturb established ground cover. Areas disturbed during the soil preparation will be fertilized and seeded at the discretion of the Engineer in accordance with these documents

3.3 FERTILIZATION

A. Do not proceed with fertilization in adverse weather and unsuitable ground conditions. Examples of these respective conditions may be wind, precipitation, frozen and untillable ground or conditions detrimental to the effectiveness of the application

B. Apply fertilizer in a manner to assure uniform distribution, light watering is acceptable for dispersion

C. In cases where work progress is stopped due to the above conditions, fertilization will begin again, when appropriate conditions exist. The application will begin again with a reasonable overlapping of the previously applied area

3.4 SEEDING METHODS

A. All seeding shall be installed either by hydroseeding or drilling method. Small areas of restoration may be broadcast seeded if directed by Engineer. *NTU: Confirm whether hydroseeding will be acceptable to client/owner.*

B. Do not proceed with seeding in adverse weather and unsuitable ground conditions. Examples of these respective conditions may be wind, precipitation, frozen or untillable ground or conditions detrimental to the effectiveness of the application. All seeding shall be performed between either March 1st to May 30th of the calendar year of construction unless indicated otherwise by Engineer

C. Hydroseeding:
   1. Apply seeded slurry with hydraulic seed at a rate of //160 lbs// live seed per 1,000 square feet, evenly in two intersecting directions
   2. Do not hydroseed areas in excess of that which can be mulched on same day
   3. Immediately following seeding apply mulch to a thickness of 1/8 inch
   4. Apply water with a fine sprat immediately after each area has been mulched. Saturate to four (4) inches of soil

D. Drilling:
   1. Accomplish seeding by means of an approved power drawn drill, followed by drag chains. The grass drill should be equipped with a satisfactory feeding mechanism, agitation, and double disk furrow openers. Equip drills with depth bands set to maintain a planting depth of approximately 3 to 2 inch and shall be set to space rows not more than 7 inches apart
   2. If inspections indicate that strips wider than the specified space between the rows planted have been left or other areas skipped, the Engineer will require immediate resowing of seed in such areas at the Contractor's expense. The seeding mixture shown in the Materials Section applies at a pure live seed rate per acre
   3. Immediately following seeding apply straw mulch at a rate of one (1) ton per acre

4. Apply water with a fine spray immediately after each area has been mulched. Saturate to four (4) inches of soil depth
5. Provide additional watering weekly until revegitation seed has germinated

3.5 AREAS TO BE RESEEDED

A. Seed all disturbed areas that are damaged or disturbed by the Contractor's activities during the entire project scope

B. Additional areas as requested by the Owner and approved by the Engineer

3.6 MAINTENANCE

A. Fertilize the seeded areas once a uniform stand of grass has been established

B. Maintain seeded areas until there is an acceptable uniform plant growth. Reseed areas that are not producing a uniform plant growth within five (5) weeks following seeding. Acceptable uniform plant growth shall be defined as that time when the scattered bare spots, not greater than 1 square foot in area, do not exceed three percent (3%) of the seeded area

C. Maintenance period - 1 year

D. Areas that are seeded late in the fall planting season which are not producing acceptable uniform plant growth, as described above, shall be reseeded during the following spring planting season. If such a condition exists, and the Contractor has diligently, in the opinion of the Engineer, pursued the performance of his work, the Owner at his option, may extend the contract completion date and reduce contract retainage. Retainage may be reduced to less than five percent (5%) of the total contract amount, but shall be at least two (2) times the estimated cost of obtaining the required growth in the indicated areas, plus areas which are susceptible to damage by winter kill, washout or other causes

E. Contractor shall control perennial weeds, thistle, spotted and napweed, spurge and other weeds during the maintenance period

3.7 SEED PROTECTION AND SLOPE STABILIZATION

A. Cover seeded slopes with erosion control fabric where grade is 4 to 1 or greater and where indicated on the Drawings and/or Section 02300. Cover seed with mulch in all other areas

B. Lay fabric smoothly on surface, bury top end of each section in 6-inch deep excavated topsoil trench. Provide 6-inch overlap minimum of adjacent rolls. Backfill trench and rake smooth, level with adjacent soil

C. Secure outside edges and overlaps at 48 inch intervals with 4-inch to 6-inch U-shaped type pins or wooden stakes depending on ground condition

D. Lightly dress slopes with topsoil to ensure close contact between fabric and soil

E. At sides of ditches, lay fabric laps in direction of water flow. Lap ends and edges minimum 6 inches

F. Maintain integrity of erosion control fabric until seed germination. If seed is washed out before germination, fertilize, reseed and restore affected areas

END OF SECTION

CONSTRUCTION STORMWATER SITE INSPECTION REPORT

Facility Name		Permittee	
Date of Inspection		Weather Conditions	
Permit Certification #		Disturbed Acreage	
Phase of Construction		Inspector Title	
Inspector Name			

	YES	NO
Is the above inspector a qualified stormwater manager? (permittee is responsible for ensuring that the inspector is a qualified stormwater manager)	☐	☐

INSPECTION FREQUENCY	
Check the box that describes the minimum inspection frequency utilized when conducting each inspection	
At least one inspection every 7 calendar days	☐
At least one inspection every 14 calendar days, with post-storm event inspections conducted within 24 hours after the end of any precipitation or snowmelt event that causes surface erosions	☐
• This is this a post-storm event inspection. Event Date: _____	☐
Reduced inspection frequency - Include site conditions that warrant reduced inspection frequency	☐
• Post-storm inspections at temporarily idle sites	☐
• Inspections at completed sites/area	☐
• Winter conditions exclusion	☐

	YES	NO
Have there been any deviations from the minimum inspection schedule? If yes, describe below.	☐	☐

INSPECTION REQUIREMENTS*
i. Visually verify all implemented control measures are in effective operational condition and are working as designed in the specifications
ii. Determine if there are new potential sources of pollutants
iii. Assess the adequacy of control measures at the site to identify areas requiring new or modified control measures to minimize pollutant discharges
iv. Identify all areas of non-compliance with the permit requirements, and if necessary, implement corrective action
*Use the attached **Control Measures Requiring Routine Maintenance** and **Inadequate Control Measures Requiring Corrective Action** forms to document results of this assessment that trigger either maintenance or corrective actions

AREAS TO BE INSPECTED			
Is there evidence of, or the potential for, pollutants leaving the construction site boundaries, entering the stormwater drainage system or discharging to state waters at the following locations?			
	NO	YES	If "YES" describe discharge or potential for discharge below. Document related maintenance, inadequate control measures and corrective actions **Inadequate Control Measures Requiring Corrective Action** form
Construction site perimeter	☐	☐	
All disturbed areas	☐	☐	
Designated haul routes	☐	☐	
Material and waste storage areas exposed to precipitation	☐	☐	
Locations where stormwater has the potential to discharge offsite	☐	☐	
Locations where vehicles exit the site	☐	☐	
Other: _____	☐	☐	

CONTROL MEASURES REQUIRING ROUTINE MAINTENANCE

Definition: Any control measure that is still operating in accordance with its design and the requirements of the permit, but requires maintenance to prevent a breach of the control measure. These items are not subject to the corrective action requirements as specified in Part I.B.1.c of the permit.

Are there control measures requiring maintenance?	NO	YES	
	☐	☐	If "YES" document below

Date Observed	Location	Control Measure	Maintenance Required	Date Completed

INADEQUATE CONTROL MEASURES REQUIRING CORRECTIVE ACTION

Definition: Any control measure that is not designed or implemented in accordance with the requirements of the permit and/or any control measure that is not implemented to operate in accordance with its design. This includes control measures that have not been implemented for pollutant sources. If it is infeasible to install or repair the control measure immediately after discovering the deficiency the reason must be documented and a schedule included to return the control measure to effective operating condition as possible.

	NO	YES	
Are there inadequate control measures requiring corrective action?	☐	☐	If "YES" document below

	NO	YES	
Are there additional control measures needed that were not in place at the time of inspection?	☐	☐	If "YES" document below

Date Discovered	Location	Description of Inadequate Control Measure	Description of Corrective Action	Was deficiency corrected when discovered? YES/NO if "NO" provide reason and schedule to correct	Date Corrected

REPORTING REQUIREMENTS

The permittee shall report the following circumstances orally within twenty-four (24) hours from the time the permittee becomes aware of the circumstances, and shall mail to the division a written report containing the information requested within five (5) working days after becoming aware of the following circumstances. The division may waive the written report required if the oral report has been received within 24 hours.

All Noncompliance Requiring 24-Hour Notification per Part II.L.6 of the Permit

a. Endangerment to Health or the Environment

Circumstances leading to any noncompliance which may endanger health or the environment regardless of the cause of the incident (See Part II.L.6.a of the Permit)

This category would primarily result from the discharge of pollutants in violation of the permit

b. Numeric Effluent Limit Violations

- o Circumstances leading to any unanticipated bypass which exceeds any effluent limitations (See Part II.L.6.b of the Permit)
- o Circumstances leading to any upset which causes an exceedance of any effluent limitation (See Part II.L.6.c of the Permit)
- o Daily maximum violations (See Part II.L.6.d of the Permit)

Numeric effluent limits are very uncommon in certifications under the COR400000 general permit. This category of noncompliance only applies if numeric effluent limits are included in a permit certification.

Has there been an incident of noncompliance requiring 24-hour notification?	NO	YES	
	☐	☐	If "YES" document below

Date and Time of Incident	Location	Description of Noncompliance	Description of Corrective Action	Date and Time of 24 Hour Oral Notification	Date of 5 Day Written Notification *

*Attach copy of 5 day written notification to report. Indicate if written notification was waived, including the name of the division personnel who granted waiver.

After adequate corrective action(s) and maintenance have been taken, or where a report does not identify any incidents requiring corrective action or maintenance, the individual(s) designated as the Qualified Stormwater Manager, shall sign and certify the below statement:

"I verify that, to the best of my knowledge and belief, all corrective action and maintenance items identified during the inspection are complete, and the site is currently in compliance with the permit."

Name of Qualified Stormwater Manager	Title of Qualified Stormwater Manager
Signature of Qualified Stormwater Manager	Date

Notes/Comments

***Sample* Grading and Stabilization Activities Log**

Date Grading Activity Initiated	**Description of Grading Activity**	**Description of Stabilization Measure and Location**	**Date Grading Activity Ceased** (Indicate Temporary or Permanent)	**Date When Stabilization Measures Initiated**