

GRADING AND EROSION CONTROL NOTES:

1. CONSTRUCTION MAY NOT COMMENCE UNTIL A CONSTRUCTION PERMIT IS OBTAINED FROM PLANNING AND COMMUNITY DEVELOPMENT AND A PRECONSTRUCTION CONFERENCE IS HELD WITH DEVELOPMENT SERVICES INSPECTIONS.
2. STORMWATER DISCHARGES FROM CONSTRUCTION SITES SHALL NOT CAUSE OR THREATEN TO CAUSE POLLUTION, CONTAMINATION, OR DEGRADATION OF STATE WATERS. ALL WORK AND EARTH DISTURBANCE SHALL BE DONE IN A MANNER THAT MINIMIZES POLLUTION OF ANY ON-SITE OR OFF SITE WATERS, INCLUDING WETLANDS.
3. NOTWITHSTANDING ANYTHING DEPICTED IN THESE PLANS IN WORDS OR GRAPHIC REPRESENTATION, ALL DESIGN AND CONSTRUCTION RELATED TO ROADS, STORM DRAINAGE AND EROSION CONTROL SHALL CONFORM TO THE STANDARDS AND REQUIREMENTS OF THE MOST RECENT VERSION OF THE RELEVANT ADOPTED EL PASO COUNTY STANDARDS, INCLUDING THE LAND DEVELOPMENT CODE, THE ENGINEERING CRITERIA MANUAL, THE DRAINAGE CRITERIA MANUAL, AND THE DRAINAGE CRITERIA MANUAL VOLUME 2. ANY DEVIATIONS TO REGULATIONS AND STANDARDS MUST BE REQUESTED, AND APPROVED, IN WRITING.
4. A SEPARATE STORMWATER MANAGEMENT PLAN (SWMP) FOR THIS PROJECT SHALL BE COMPLETED AND AN EROSION AND STORMWATER QUALITY CONTROL PERMIT (ESQCP) ISSUED PRIOR TO COMMENCING CONSTRUCTION. DURING CONSTRUCTION THE SWMP IS THE RESPONSIBILITY OF THE DESIGNATED STORMWATER MANAGER, SHALL BE LOCATED ON SITE AT ALL TIMES AND SHALL BE KEPT UP TO DATE WITH WORK PROGRESS AND CHANGES IN THE FIELD.
5. ONCE THE ESQCP HAS BEEN ISSUED, THE CONTRACTOR MAY INSTALL THE INITIAL STAGE EROSION AND SEDIMENT CONTROL BMPs AS INDICATED ON THE GEC. A PRECONSTRUCTION MEETING BETWEEN THE CONTRACTOR, ENGINEER, AND EL PASO COUNTY WILL BE HELD PRIOR TO ANY CONSTRUCTION. IT IS THE RESPONSIBILITY OF THE APPLICANT TO COORDINATE THE MEETING TIME AND PLACE WITH COUNTY PCD INSPECTIONS STAFF.
6. SOIL EROSION CONTROL MEASURES FOR ALL SLOPES, CHANNELS, DITCHES, OR ANY DISTURBED LAND AREA SHALL BE COMPLETED WITHIN 21 CALENDAR DAYS AFTER FINAL GRADING, OR FINAL EARTH DISTURBANCE, HAS BEEN COMPLETED. DISTURBED AREAS AND STOCKPILES WHICH ARE NOT AT FINAL GRADE BUT WILL REMAIN DORMANT FOR LONGER THAN 30 DAYS SHALL ALSO BE MULCHED WITHIN 21 DAYS AFTER INTERIM GRADING. AN AREA THAT IS GOING TO REMAIN IN AN INTERIM STATE FOR MORE THAN 60 DAYS SHALL ALSO BE SEEDED. ALL TEMPORARY SOIL EROSION CONTROL MEASURES AND BMPs SHALL BE MAINTAINED UNTIL PERMANENT SOIL EROSION CONTROL MEASURES ARE IMPLEMENTED AND ESTABLISHED.
7. TEMPORARY SOIL EROSION CONTROL FACILITIES SHALL BE REMOVED AND EARTH DISTURBANCE AREAS GRADED AND STABILIZED WITH PERMANENT SOIL EROSION CONTROL MEASURES PURSUANT TO STANDARDS AND SPECIFICATION PRESCRIBED IN THE DCM VOLUME II AND THE ENGINEERING CRITERIA MANUAL (ECM) APPENDIX I.
8. ALL PERSONS ENGAGED IN EARTH DISTURBANCE SHALL IMPLEMENT AND MAINTAIN ACCEPTABLE SOIL EROSION AND SEDIMENT CONTROL MEASURES INCLUDING BMPs IN CONFORMANCE WITH THE EROSION CONTROL TECHNICAL STANDARDS OF THE DRAINAGE CRITERIA MANUAL (DCM) VOLUME II AND IN ACCORDANCE WITH THE STORMWATER MANAGEMENT PLAN (SWMP).
9. ALL TEMPORARY EROSION CONTROL FACILITIES INCLUDING BMPs AND ALL PERMANENT FACILITIES INTENDED TO CONTROL EROSION OF ANY EARTH DISTURBANCE OPERATIONS, SHALL BE INSTALLED AS DEFINED IN THE APPROVED PLANS, THE SWMP AND THE DCM VOLUME II AND MAINTAINED THROUGHOUT THE DURATION OF THE EARTH DISTURBANCE OPERATION.
10. ANY EARTH DISTURBANCE SHALL BE CONDUCTED IN SUCH A MANNER SO AS TO EFFECTIVELY REDUCE ACCELERATED SOIL EROSION AND RESULTING SEDIMENTATION. ALL DISTURBANCES SHALL BE DESIGNED, CONSTRUCTED, AND COMPLETED SO THAT THE EXPOSED AREA OF ANY DISTURBED LAND SHALL BE LIMITED TO THE SHORTEST PRACTICAL PERIOD OF TIME.
11. ANY TEMPORARY OR PERMANENT FACILITY DESIGNED AND CONSTRUCTED FOR THE CONVEYANCE OF STORMWATER AROUND, THROUGH, OR FROM THE EARTH DISTURBANCE AREA SHALL BE DESIGNED TO LIMIT THE DISCHARGE TO A NON-EROSIVE VELOCITY.
12. CONCRETE WASH WATER SHALL BE CONTAINED AND DISPOSED OF IN ACCORDANCE WITH THE SWMP. NO WASH WATER SHALL BE DISCHARGED TO OR ALLOWED TO RUNOFF TO STATE WATERS, INCLUDING ANY SURFACE OR SUBSURFACE STORM DRAINAGE SYSTEM OR FACILITIES.
13. EROSION CONTROL BLANKETING IS TO BE USED ON SLOPES STEEPER THAN 3:1.
14. BUILDING, CONSTRUCTION, EXCAVATION, OR OTHER WASTE MATERIALS SHALL NOT BE TEMPORARILY PLACED OR STORED IN THE STREET, ALLEY, OR OTHER PUBLIC WAY, UNLESS IN ACCORDANCE WITH AN APPROVED TRAFFIC CONTROL PLAN. BMPs MAY BE REQUIRED BY EL PASO COUNTY ENGINEERING IF DEEMED NECESSARY, BASED ON SPECIFIC CONDITIONS AND CIRCUMSTANCES.
15. VEHICLE TRACKING OF SOILS AND CONSTRUCTION DEBRIS OFF-SITE SHALL BE MINIMIZED. MATERIALS TRACKED OFFSITE SHALL BE CLEANED UP AND PROPERLY DISPOSED OF IMMEDIATELY.
16. CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL WASTES FROM THE CONSTRUCTION SITE FOR DISPOSAL IN ACCORDANCE WITH LOCAL AND STATE REGULATORY REQUIREMENTS. NO CONSTRUCTION DEBRIS, TREE SLASH, BUILDING MATERIAL WASTES OR UNUSED BUILDING MATERIALS SHALL BE BURIED, DUMPED, OR DISCHARGED AT THE SITE.
17. THE OWNER, SITE DEVELOPER, CONTRACTOR, AND/OR THEIR AUTHORIZED AGENTS SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL CONSTRUCTION DEBRIS, DIRT, TRASH, ROCK, SEDIMENT, AND SAND THAT MAY ACCUMULATE IN THE STORM SEWER OR OTHER DRAINAGE CONVEYANCE SYSTEM AND STORMWATER APPURTENANCES AS A RESULT OF SITE DEVELOPMENT.
18. THE QUANTITY OF MATERIALS STORED ON THE PROJECT SITE SHALL BE LIMITED, AS MUCH AS PRACTICAL, TO THAT QUANTITY REQUIRED TO PERFORM THE WORK IN AN ORDERLY SEQUENCE. ALL MATERIALS STORED ON-SITE SHALL BE STORED IN A NEAT, ORDERLY MANNER, IN THEIR ORIGINAL CONTAINERS, WITH ORIGINAL MANUFACTURER'S LABELS.
19. NO CHEMICALS ARE TO BE USED BY THE CONTRACTOR, WHICH HAVE THE POTENTIAL TO BE RELEASED IN STORMWATER UNLESS PERMISSION FOR THE USE OF A SPECIFIC CHEMICAL IS GRANTED IN WRITING BY THE ECM ADMINISTRATOR. IN GRANTING THE USE OF SUCH CHEMICALS, SPECIAL CONDITIONS AND MONITORING MAY BE REQUIRED.
20. BULK STORAGE STRUCTURES FOR PETROLEUM PRODUCTS AND OTHER CHEMICALS SHALL HAVE ADEQUATE PROTECTION SO AS TO CONTAIN ALL SPILLS AND PREVENT ANY SPILLED MATERIAL FROM ENTERING STATE WATERS, INCLUDING ANY SURFACE OR SUBSURFACE STORM DRAINAGE SYSTEM OR FACILITIES.
21. NO PERSON SHALL CAUSE THE IMPEDIMENT OF STORMWATER FLOW IN THE FLOW LINE OF THE CURB AND GUTTER OR IN THE DITCHLINE.
22. INDIVIDUALS SHALL COMPLY WITH THE "COLORADO WATER QUALITY CONTROL ACT" (TITLE 25, ARTICLE 8, CRS), AND THE "CLEAN WATER ACT" (33 USC 1344), IN ADDITION TO THE REQUIREMENTS INCLUDED IN THE DCM VOLUME II AND THE ECM APPENDIX I. ALL APPROPRIATE PERMITS MUST BE OBTAINED BY THE CONTRACTOR PRIOR TO CONSTRUCTION (NPDES, FLOODPLAIN, 404, FUGITIVE DUST, ETC.). IN THE EVENT OF CONFLICTS BETWEEN THESE REQUIREMENTS AND LAWS, RULES, OR REGULATIONS OF OTHER FEDERAL, STATE, OR COUNTY AGENCIES, THE MORE RESTRICTIVE LAWS, RULES, OR REGULATIONS SHALL APPLY.
23. ALL CONSTRUCTION TRAFFIC MUST ENTER/EXIT THE SITE AT APPROVED CONSTRUCTION ACCESS POINTS.
24. PRIOR TO ACTUAL CONSTRUCTION THE PERMITEE SHALL VERIFY THE LOCATION OF EXISTING UTILITIES.
25. A WATER SOURCE SHALL BE AVAILABLE ON SITE DURING EARTHWORK OPERATIONS AND UTILIZED AS REQUIRED TO MINIMIZE DUST FROM EARTHWORK EQUIPMENT AND WIND.
26. THE SOILS REPORT FOR THIS SITE HAS BEEN PREPARED BY ENTECH ENGINEERING, INC. # 76021 JUNE 1, 2011. AND SHALL BE CONSIDERED A PART OF THESE PLANS.
27. AT LEAST TEN DAYS PRIOR TO THE ANTICIPATED START OF CONSTRUCTION, FOR PROJECTS THAT WILL DISTURB 1 ACRE OR MORE, THE OWNER OR OPERATOR OF CONSTRUCTION ACTIVITY SHALL SUBMIT A PERMIT APPLICATION FOR STORMWATER DISCHARGE TO THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT, WATER QUALITY DIVISION. THE APPLICATION CONTAINS CERTIFICATION OF COMPLETION OF A STORMWATER MANAGEMENT PLAN (SWMP), OF WHICH THIS GRADING AND EROSION CONTROL PLAN MAY BE A PART. FOR INFORMATION OR APPLICATION MATERIALS CONTACT:

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



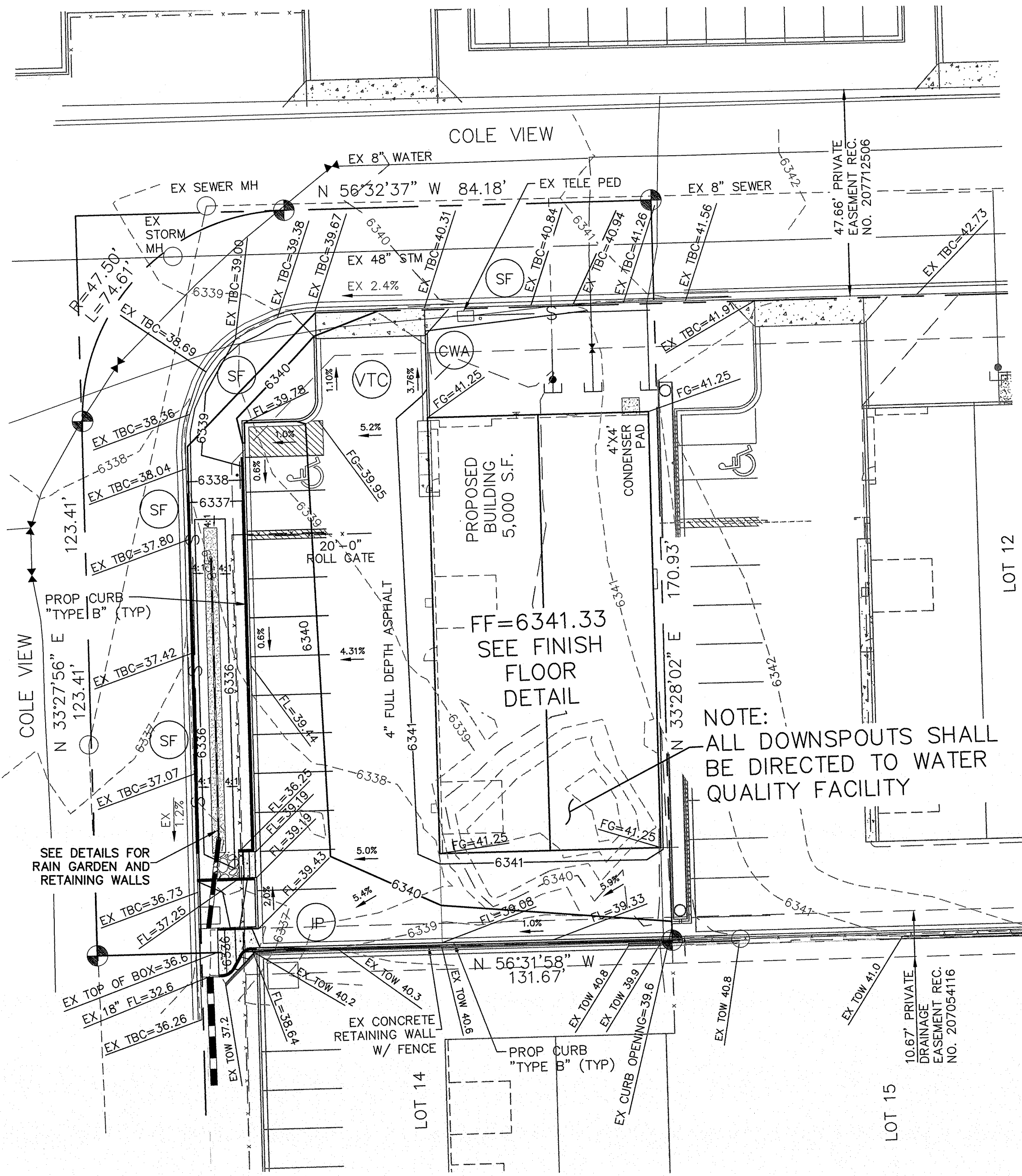
FOR BURIED UTILITY INFORMATION
48 HRS BEFORE YOU DIG
CALL 1-800-922-1987

FOR LOCATING & MARKING GAS,
ELECTRIC, WATER & TELEPHONE LINES
WATER EMERGENCIES 520-0300

CBP , LOT 13

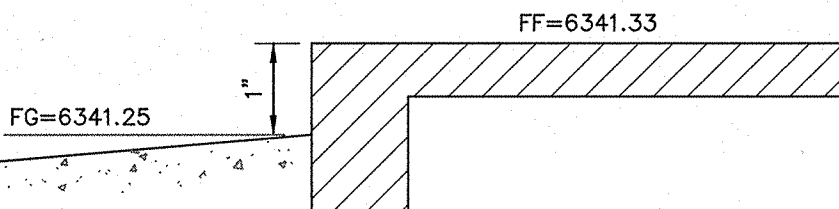
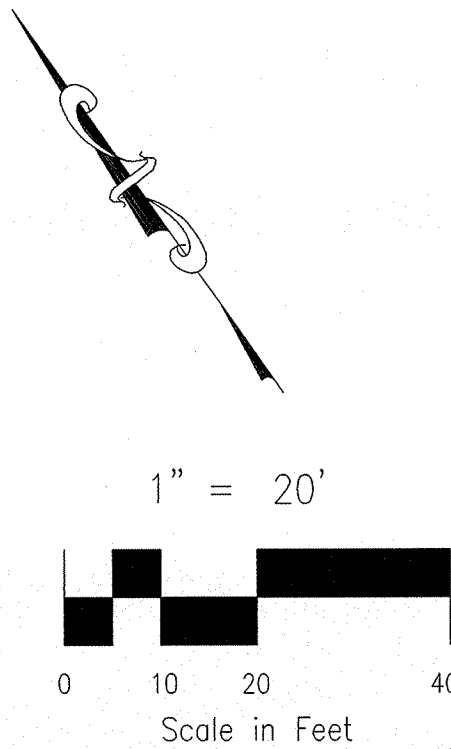
EL PASO COUNTY, STATE OF COLORADO
GRADING & EROSION CONTROL PLAN

LOT 13 OF CLAREMONT BUSINESS PARK FIL. NO. 2

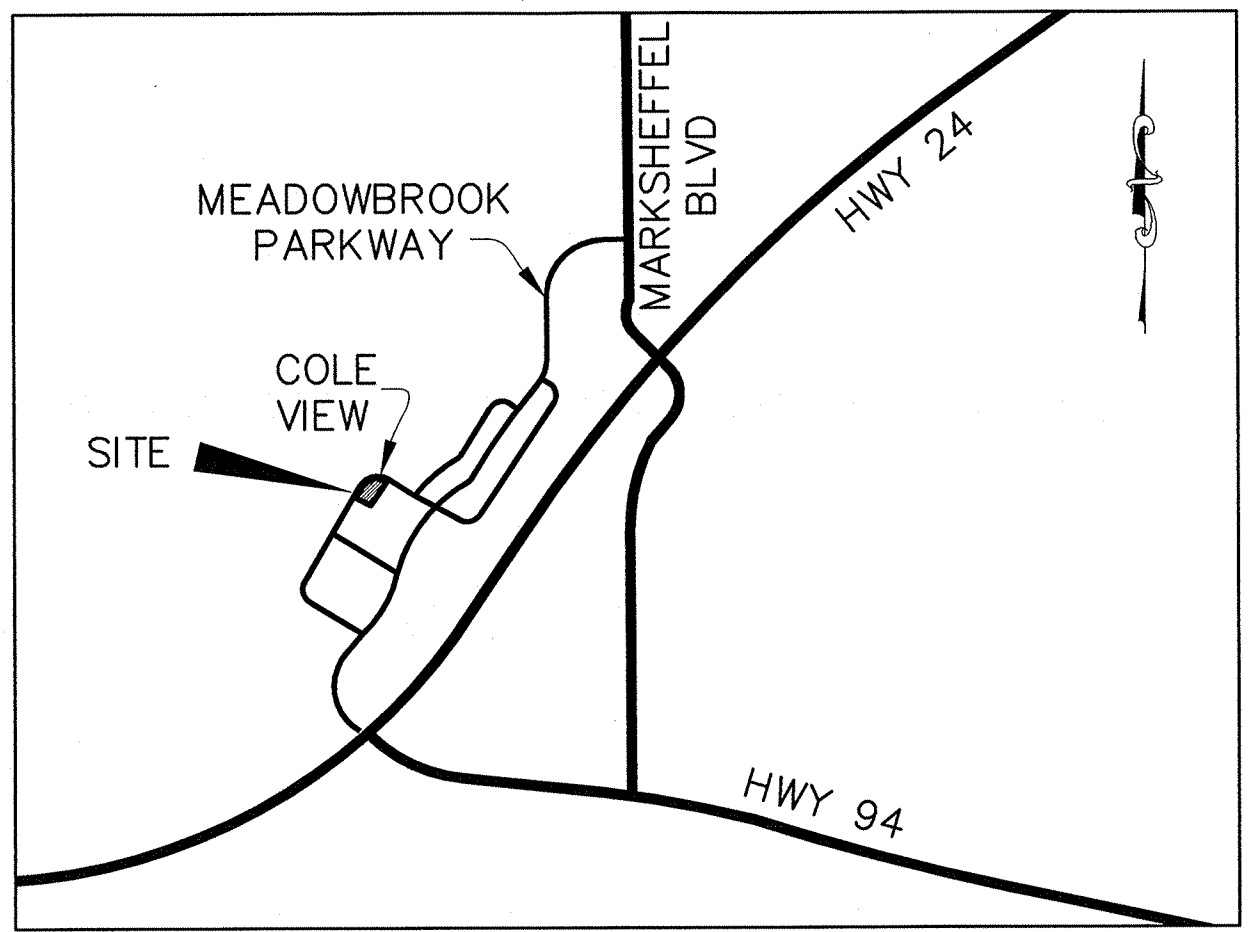


LEGEND

| | |
|-----|--------------------------|
| LP | MAJ CONT |
| HP | MIN CONT |
| EX | PROP MAJ CONT |
| FL | PROP MIN CONT |
| TC | LOW POINT |
| FG | HIGH POINT |
| FF | EXISTING |
| TOF | FLOWLINE |
| SF | TOP OF CURB |
| VTC | FINISH GRADE |
| CWA | FINISH FLOOR |
| IP | TOP OF FOOTING |
| S | SILT FENCE |
| | VEHICLE TRACKING CONTROL |
| | CONCRETE WASH-OUT BASIN |
| | INLET PROTECTION |



BUILDING FINISH FLOOR DETAIL

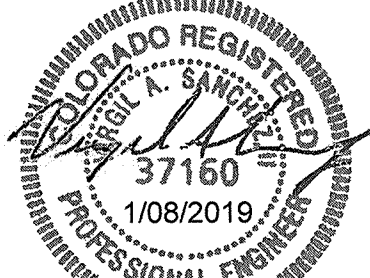


VICINITY MAP

N.T.S.

DESIGN ENGINEER'S STATEMENT

THIS GRADING AND EROSION CONTROL PLAN WAS PREPARED UNDER MY DIRECTION AND SUPERVISION AND IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. SAID PLAN HAS BEEN PREPARED ACCORDING TO THE CRITERIA ESTABLISHED BY THE COUNTY FOR GRADING AND EROSION CONTROL PLANS. I ACCEPT RESPONSIBILITY FOR ANY LIABILITY CAUSED BY NEGLIGENT ACTS, ERRORS OR OMISSIONS ON MY PART IN PREPARING THIS PLAN.



VIRGIL A. SANCHEZ, COLORADO P.E. #37160 DATE
FOR AND ON BEHALF OF M & S CIVIL CONSULTANTS, INC.

OWNER/DEVELOPER'S STATEMENT:

I, THE OWNER/DEVELOPER HAVE READ AND WILL COMPLY WITH ALL OF THE REQUIREMENTS SPECIFIED IN THESE DETAILED PLANS AND SPECIFICATIONS.

NAME: *Don T. J.* DATE: *11/01/19*

DBA: *HAMMERS CONSTRUCTION* *Rocko Investments*

ADDRESS: *1441 WOODLEY HEIGHTS, COLORADO SPRINGS, 80915*
7204 Coleu

EL PASO COUNTY:

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

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

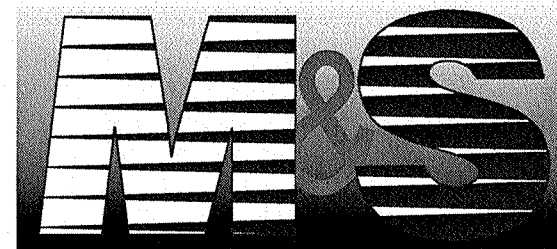
IN ACCORDANCE WITH ECM SECTION 1.12, THESE CONSTRUCTION DOCUMENTS WILL BE VALID FOR CONSTRUCTION FOR A PERIOD OF 2 YEARS FROM THE DATE SIGNED BY THE EL PASO COUNTY ENGINEER. IF CONSTRUCTION HAS NOT STARTED WITHIN THOSE 2 YEARS, THE PLANS WILL NEED TO BE RESUBMITTED FOR APPROVAL, INCLUDING PAYMENT OF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

Approved

by Elizabeth Nijamp
El Paso County Planning and Community Development
on behalf of Jennifer Irvine, County Engineer, ECM Administrator

JENNIFER IRVINE, P.E.
COUNTY ENGINEER / ECM ADMINISTRATOR

02/13/2019 6:50:38 AM



20 BOULDER CRESCENT, SUITE 110
COLORADO SPRINGS, CO 80903
PHONE: 719.955.5485

CIVIL CONSULTANTS, INC.

SHEET 1 OF 4

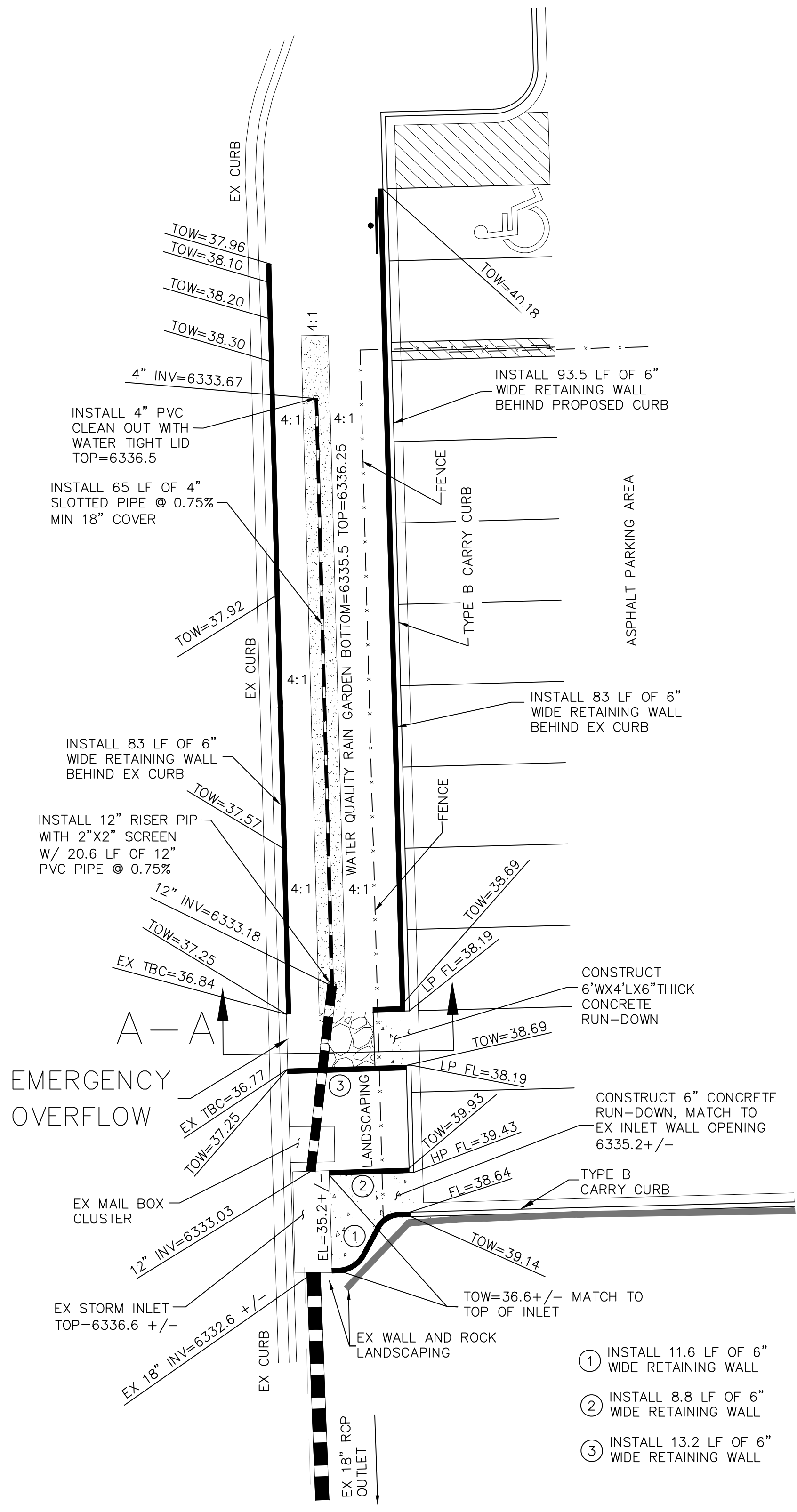
GRADING & EROSION CONTROL PLAN
CBP LOT 13
JOB NO. 44-028
DATE PREPARED: SEPT 16, 2018
DATE REVISED: NOVEMBER 5, 2018

EL PASO COUNTY FILE NO. PPR 18-044

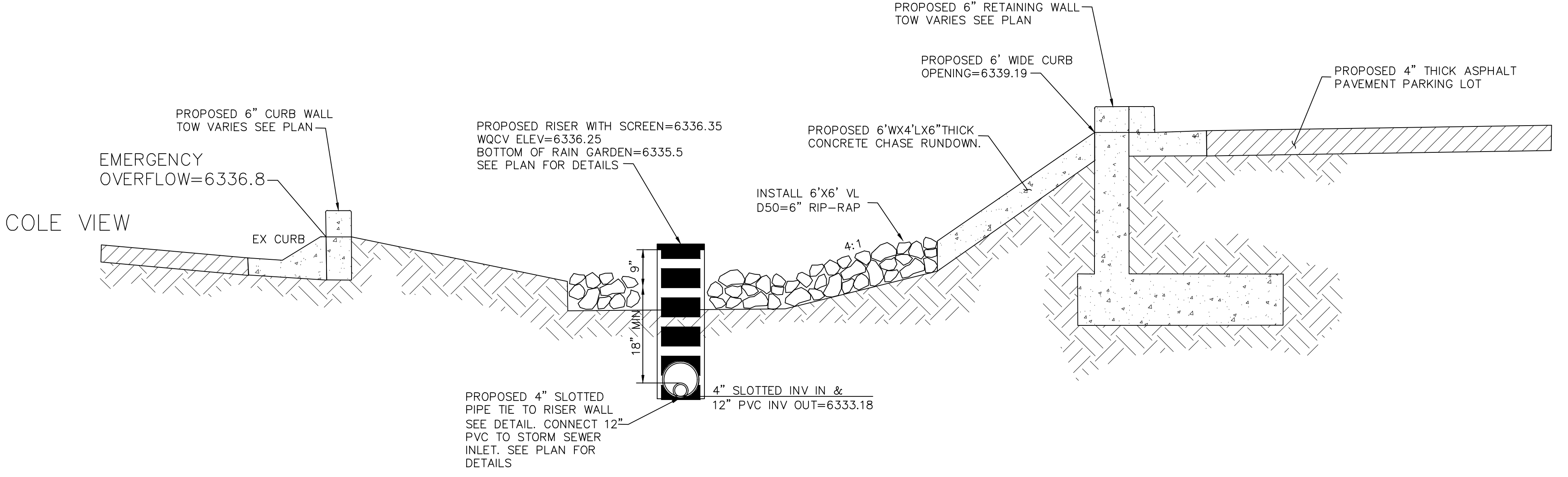
CBP , LOT 13

EL PASO COUNTY, STATE OF COLORADO
GRADING & EROSION CONTROL PLAN

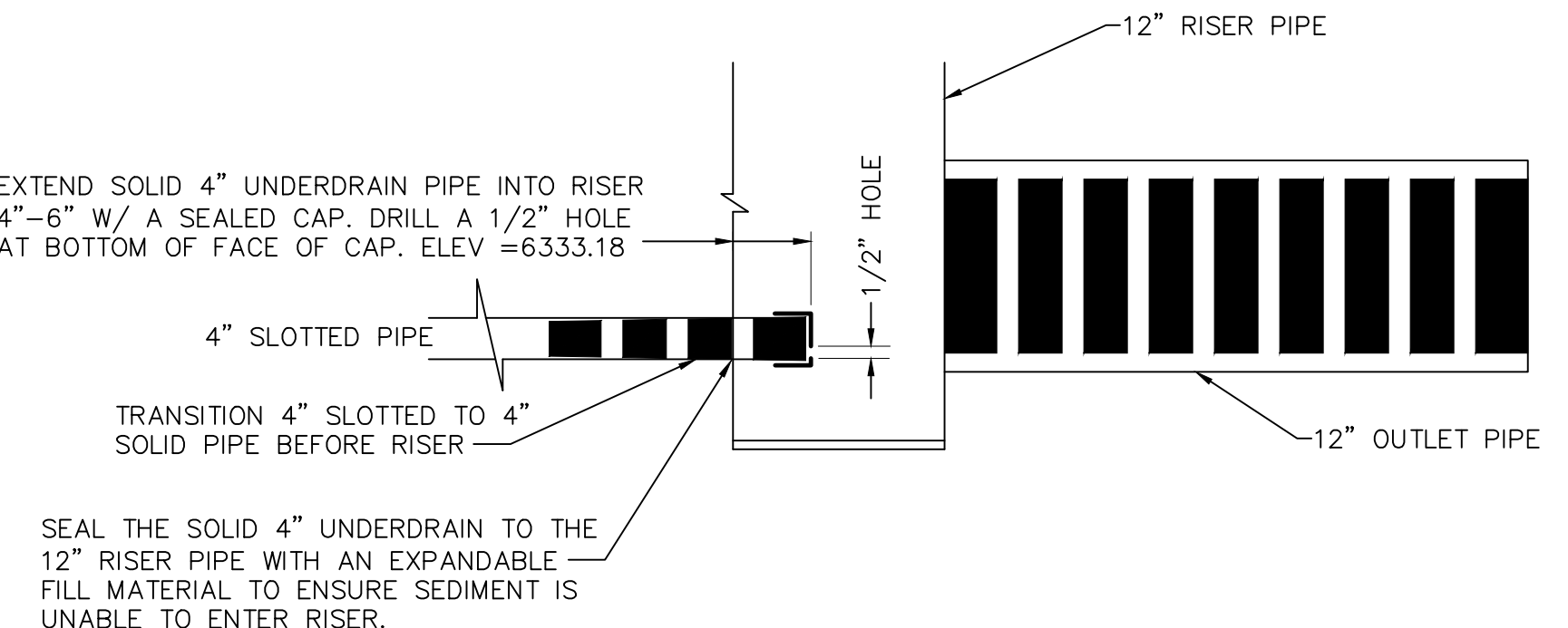
LOT 13 OF CLAREMONT BUSINESS PARK FIL. NO. 2



RAIN GARDEN & STORM WATER DETAIL



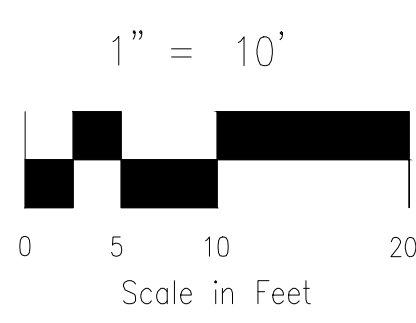
SECTION A-A W/ RISER DETAILS
NOT TO SCALE



4" UNDERDRAIN/RISER DETAIL

FOR BURIED UTILITY INFORMATION
48 HRS BEFORE YOU DIG
CALL 1-800-922-1987

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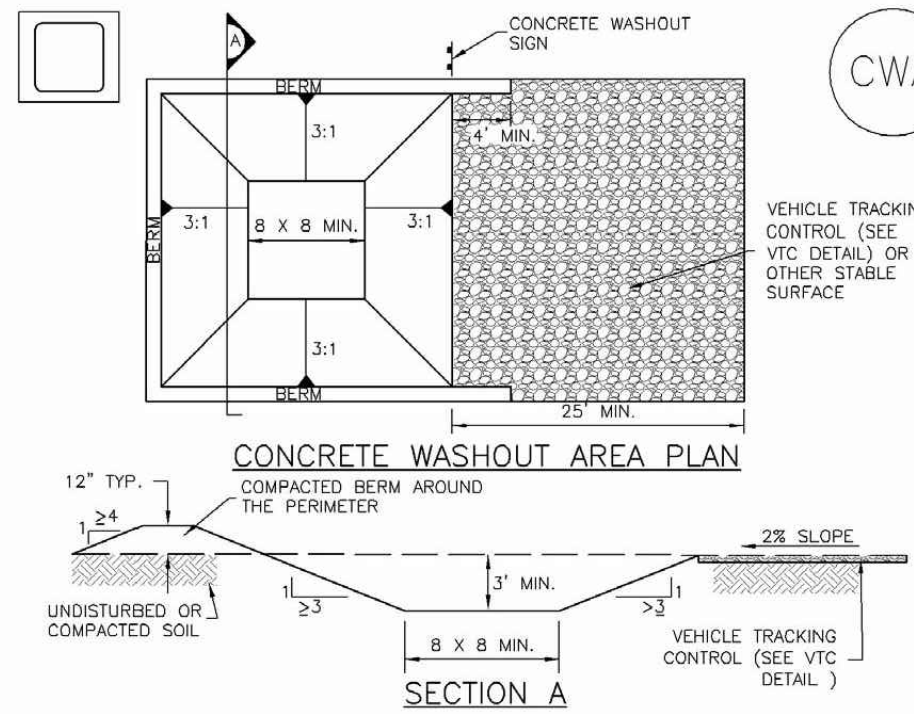


20 BOULDER CRESCENT, SUITE 110
COLORADO SPRINGS, CO 80903
PHONE: 719.955.5485

EPC 2/13/19

Concrete Washout Area (CWA)

MM-1



CWA-1. CONCRETE WASHOUT AREA

CWA INSTALLATION NOTES

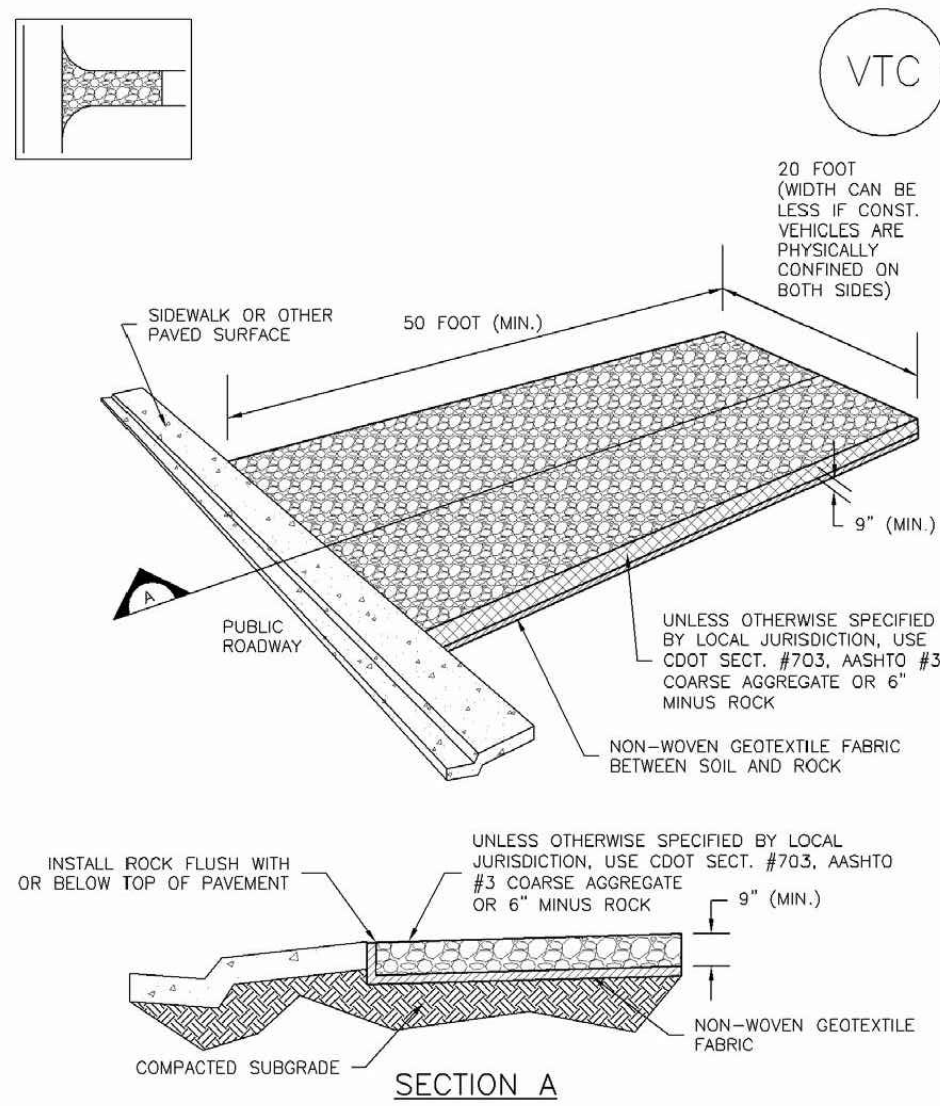
- SEE PLAN VIEW FOR:
-CWA INSTALLATION LOCATION.
- DO NOT LOCATE AN UNLINED CWA WITHIN 400' OF ANY NATURAL DRAINAGE PATHWAY OR WATERBODY. DO NOT LOCATE WITHIN 1,000' OF ANY WELLS OR DRINKING WATER SOURCES. IF SITE CONSTRAINTS MAKE THIS INFEASIBLE, OR IF HIGHLY PERMEABLE SOILS EXIST ON SITE, THE CWA MUST BE INSTALLED WITH AN IMPERMEABLE LINER (18 MIL MIN. THICKNESS) OR SURFACE STORAGE ALTERNATIVES USING PREFABRICATED CONCRETE WASHOUT DEVICES OR A LINED ABOVE GROUND STORAGE ARE SHOULD BE USED.
- THE CWA SHALL BE INSTALLED PRIOR TO CONCRETE PLACEMENT ON SITE.
- 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.
- BERM SURROUNDING SIDES AND BACK OF THE CWA SHALL HAVE MINIMUM HEIGHT OF 1'.
- VEHICLE TRACKING PAD SHALL BE SLOPED 2% TOWARDS THE CWA.
- 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 TRIS.
- USE EXCAVATED MATERIAL FOR PERIMETER BERM CONSTRUCTION.

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CWA-3

Vehicle Tracking Control (VTC)

SM-4



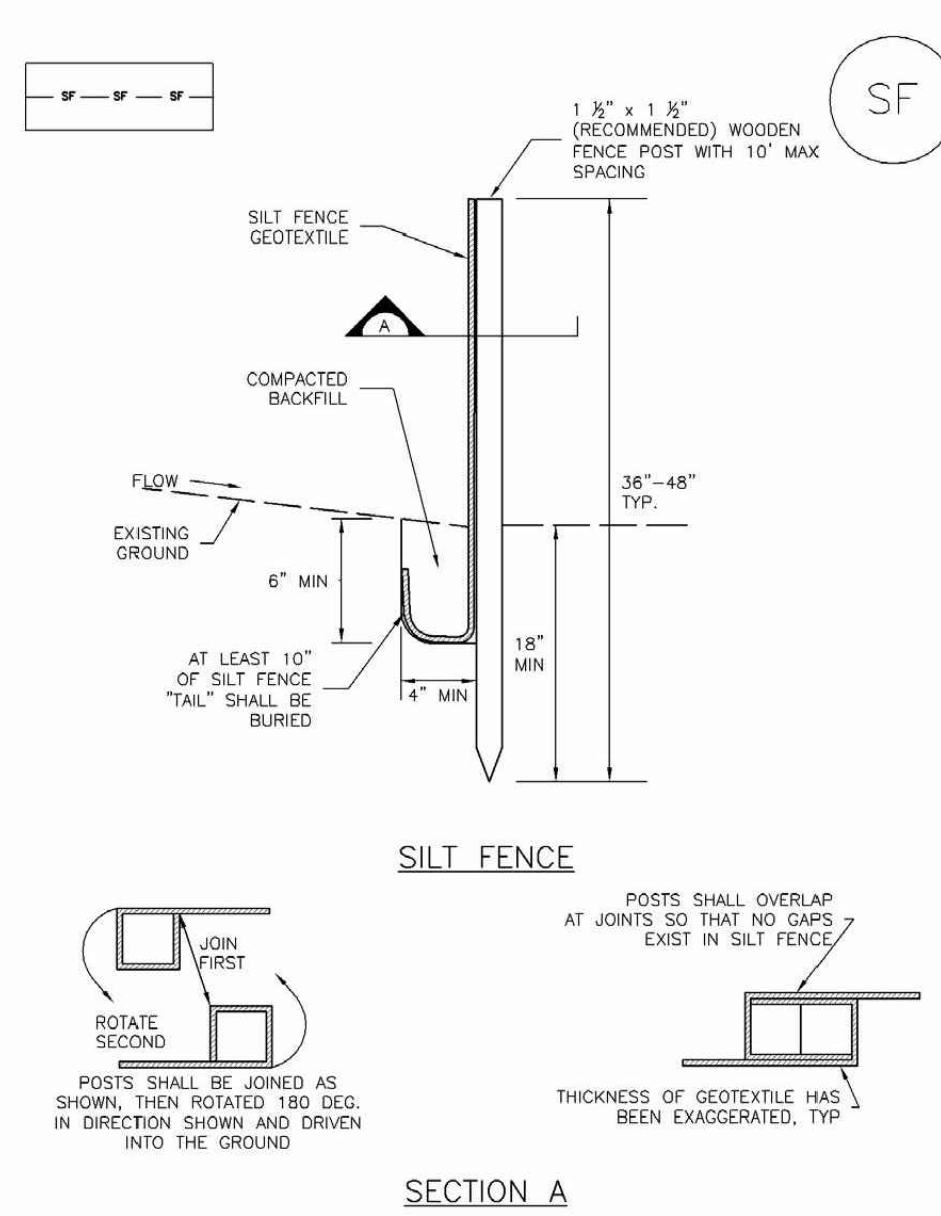
VTC-1. AGGREGATE VEHICLE TRACKING CONTROL

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Urban Storm Drainage Criteria Manual Volume 3

VTC-3

Silt Fence (SF)

SC-1



SF-1. SILT FENCE

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SF-3

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

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

| Common ¹ Name | Botanical Name | Growth Season ² | Growth Form | Seeds/ Pound | Pounds of PLS/acre |
|---|--|-------------------------------|----------------|-----------------|-----------------------|
| Alkali Soil Seed Mix | | | | | |
| Alkali sacaton | <i>Sporobolus airoides</i> | Cool | Bunch | 1,750,000 | 0.25 |
| Basin wildrye | <i>Elymus cinereus</i> | Cool | Bunch | 165,000 | 2.5 |
| Sodiar streambank wheatgrass | <i>Agropyron riparium Sodal⁴</i> | Cool | Sod | 170,000 | 2.5 |
| Jose tall wheatgrass | <i>Agropyron elongatum Jose⁴</i> | Cool | Bunch | 70,000 | 7.0 |
| Arriba western wheatgrass | <i>Agropyron amabil⁴ Terribat⁴</i> | Cool | Sod | 110,000 | 5.5 |
| Total | | | | | 17.75 |
| Fertile Loamy Soil Seed Mix | | | | | |
| Ephraim crested wheatgrass | <i>Agropyron cristatum Ephraim⁴</i> | Cool | Sod | 175,000 | 2.0 |
| Dural hard fescue | <i>Festuca ovina 'duruscula'</i> | Cool | Bunch | 565,000 | 1.0 |
| Lincoln smooth brome | <i>Bromus inermis leys⁴ Lincoln⁴</i> | Cool | Sod | 130,000 | 3.0 |
| Sodiar streambank wheatgrass | <i>Agropyron riparium Sodal⁴</i> | Cool | Sod | 170,000 | 2.5 |
| Arriba western wheatgrass | <i>Agropyron amabil⁴ Terribat⁴</i> | Cool | Sod | 110,000 | 7.0 |
| Total | | | | | 15.5 |
| High Water Table Soil Seed Mix | | | | | |
| Meadow foxtail | <i>Alopecurus pratensis</i> | Cool | Sod | 900,000 | 0.5 |
| Redtop | <i>Agrostis alba</i> | Warm | Open sod | 5,000,000 | 0.25 |
| Road canarygrass | <i>Phalaris arundinacea</i> | Cool | Sod | 68,000 | 0.5 |
| Lincoln smooth brome | <i>Bromus inermis leys⁴ Lincoln⁴</i> | Cool | Sod | 130,000 | 3.0 |
| Puffblower switchgrass | <i>Panicum virgatum Puffblower⁴</i> | Warm | Sod | 389,000 | 1.0 |
| Albar tall wheatgrass | <i>Agropyron elongatum Albar⁴</i> | Cool | Bunch | 70,000 | 5.5 |
| Total | | | | | 10.75 |
| Transition Turf Seed Mix³ | | | | | |
| Ruebens Canadian blugrass | <i>Poa compressa Ruebens⁴</i> | Cool | Sod | 2,500,000 | 0.5 |
| Dural hard fescue | <i>Festuca ovina 'duruscula'</i> | Cool | Bunch | 565,000 | 1.0 |
| Citation perennial ryegrass | <i>Lolium perenne 'Citation'</i> | Cool | Sod | 247,000 | 3.0 |
| Lincoln smooth brome | <i>Bromus inermis leys⁴ Lincoln⁴</i> | Cool | Sod | 130,000 | 3.0 |
| Total | | | | | 7.5 |

TS/PS-4 Urban Drainage and Flood Control District
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June 2012

Temporary and Permanent Seeding (TS/PS)

EC-2

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

| Common Name | Botanical Name | Growth Season ² | Growth Form | Seeds/ Pound | Pounds of PLS/acre |
|--|--|-------------------------------|------------------------|-----------------|-----------------------|
| Sandy Soil Seed Mix | | | | | |
| Blue grama | <i>Bouteloua gracilis</i> | Warm | Sod-forming bunchgrass | 825,000 | 0.5 |
| Camper little bluestem | <i>Setchachlorium scoparium Camper⁴</i> | Warm | Bunch | 240,000 | 1.0 |
| Prairie sandreed | <i>Calamagrostis longifolia</i> | Warm | Open sod | 274,000 | 1.0 |
| Sand dropseed | <i>Sporobolus cryptandrus</i> | Cool | Bunch | 5,298,000 | 0.25 |
| Vaughn sidecoats grama | <i>Bouteloua curtipendula Vaughn⁴</i> | Warm | Sod | 191,000 | 2.0 |
| Arriba western wheatgrass | <i>Agropyron amabil⁴ Terribat⁴</i> | Cool | Sod | 110,000 | 5.5 |
| Total | | | | | 10.25 |
| Heavy Clay, Rocky Foothill Seed Mix | | | | | |
| Ephraim crested wheatgrass ⁴ | <i>Agropyron cristatum Ephraim⁴</i> | Cool | Sod | 175,000 | 1.5 |
| Oahe intermediate wheatgrass | <i>Agropyron intermedium Oahe⁴</i> | Cool | Sod | 115,000 | 5.5 |
| Vaughn sidecoats grama ⁴ | <i>Bouteloua curtipendula Vaughn⁴</i> | Warm | Sod | 191,000 | 2.0 |
| Lincoln smooth brome | <i>Bromus inermis leys⁴ Lincoln⁴</i> | Cool | Sod | 130,000 | 3.0 |
| Arriba western wheatgrass | <i>Agropyron amabil⁴ Terribat⁴</i> | Cool | Sod | 110,000 | 5.5 |
| Total | | | | | 17.5 |

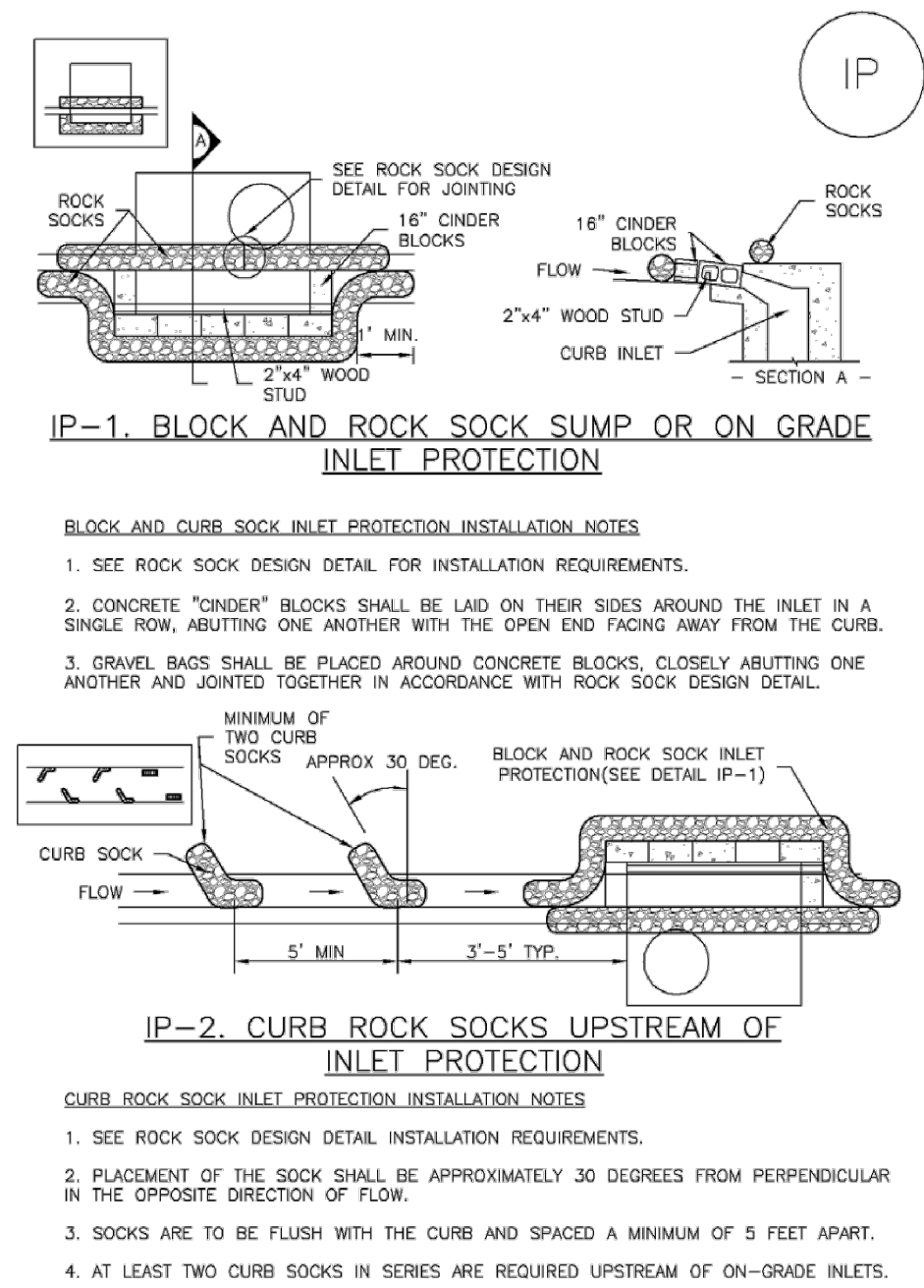
- ¹ All of the above seeding mixes and rates are based on drill seeding followed by crimped straw mulch. These rates should be doubled if seed is broadcast and should be increased by 50 percent if the seeding is done using a Brillion Drill or is applied through hydraulic seeding. Hydraulic seeding may 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.
- ² See Table TS/PS-3 for seeding dates.
- ³ If site is to be irrigated, the transition turf seed rates should be doubled.
- ⁴ Crested wheatgrass should not be used on slopes steeper than 6H to 1V.
- ⁵ Can substitute 0.5 lbs PLS of blue grama for the 2.0 lbs PLS of Vaughn sidecoats grama.

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TS/PS-5

SC-6

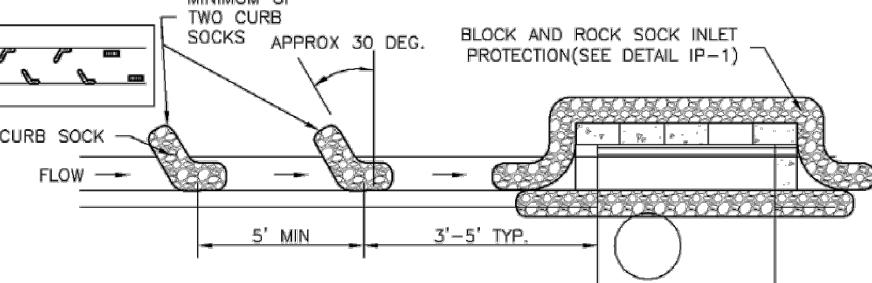
Inlet Protection (IP)



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

BLOCK AND CURB SOCK INLET PROTECTION INSTALLATION NOTES

- SEE ROCK SOCK DESIGN DETAIL FOR INSTALLATION REQUIREMENTS.
- CONCRETE "CINDER" BLOCKS SHALL BE LAID ON THEIR SIDES AROUND THE INLET IN A SINGLE ROW, ABUTTING ONE ANOTHER WITH THE OPEN END FACING AWAY FROM THE CURB.
- GRAVEL BAGS SHALL BE PLACED AROUND CONCRETE BLOCKS, CLOSELY ABUTTING ONE ANOTHER AND JOINED TOGETHER IN ACCORDANCE WITH ROCK SOCK DESIGN DETAIL.



IP-2. CURB ROCK SOCKS UPSTREAM OF INLET PROTECTION

CURB ROCK SOCK INLET PROTECTION INSTALLATION NOTES

- SEE ROCK SOCK DESIGN DETAIL INSTALLATION REQUIREMENTS.
- PLACEMENT OF THE SOCK SHALL BE APPROXIMATELY 30 DEGREES FROM PERPENDICULAR IN THE OPPOSITE DIRECTION OF FLOW.
- SOCKS ARE TO BE FLUSH WITH THE CURB AND SPACED A MINIMUM OF 5 FEET APART.
- AT LEAST TWO CURB SOCKS IN SERIES ARE REQUIRED UPSTREAM OF ON-GRADE INLETS.

August 2013 Urban Drainage and Flood Control District
Urban Storm Drainage Criteria Manual Volume 3

IP-4

EL PASO COUNTY FILE NO. PPR 18-044

GRADING & EROSION CONTROL PLAN DETAILS
CBP LOT 13
JOB NO. 44-028
DATE PREPARED: SEPT 16, 2018
DATE REVISED: NOVEMBER 5, 2018

EPC 2/13/19

20 BOULDER CRESCENT, SUITE 110
COLORADO SPRINGS, CO 80903
PHONE: 719.955.5485

SHEET 3 OF 4

T-3

Is Pretreatment Needed?

Designing the inflow gutter to the rain garden at a minimal slope of 0.5% can facilitate sediment and debris deposition prior to flows entering the BMP. Be aware, this will reduce maintenance of the BMP, but may require more frequent sweeping of the gutter to ensure that the sediment does not impede flow into the rain garden.

- ### Design Procedure and Criteria

- **Subsurface Exploration and Determination of a No-Infiltration, Partial Infiltration, or Full Infiltration Section:** Infiltration BMPs can have three basic types of sections. The appropriate section will depend on land use and activities, proximity to adjacent structures and soil characteristics. Sections of each type are described below.
 - **No-Infiltration Section:** This section includes an underdrain and an impermeable liner that prevents infiltration of stormwater into the subgrade soils. Consider using this section when any of the following conditions exist:
 - The site is a stormwater hotspot and infiltration could result in contamination of groundwater.
 - The site is located over contaminated soils and infiltration could mobilize these contaminants.
 - The facility is located over potentially expansive soils or bedrock that could swell due to infiltration and potentially damage adjacent structures (e.g., building foundation or pavement).
 - **Partial Infiltration Section:** This section does not include an impermeable liner, and allows some infiltration. Stormwater that does not infiltrate is collected and removed by an underdrain.

B-3

Bioretention

geotechnical engineer should scope and perform a subsurface study. Typical geotechnical investigation needed to select and design the section includes:

- Urban Drainage and Flood Control District November 201

T-3

2. **Basin Storage Volume:** Provide a storage volume based on a 12-hour drain time.

Find the required WQCV (watershed inches of runoff). Using the imperviousness of the tributary area (or effective imperviousness where LID elements are used upstream), use Figure 3-2 located in Chapter 3 of this manual to determine the WQCV based on a 12-hour drain time.

Equation B-1

Where

V = design volume (ft³)

A = area of watershed tributary to the rain garden (ft^2)

- Note that the total surcharge volume provided by the design must also equal or exceed the design volume. Where needed to meet the required volume, also consider the porosity of the media at 1+ percent. Use vertical walls or slope the sides of the basin to achieve the required volume. Sideslopes should be no steeper than 4:1 (horizontal:vertical).

Equation B-

Where

A_f = minimum (flat) filter area (ft²)

A = area tributary to the rain garden (ft^2)

I = imperviousness of area tributary to the rain garden (percent expressed as a decimal)

B-3

T-3

[illegible]

B-7

Bioretention

- Calculate the diameter of the orifice for a 12-hour drain time using Equation B-3 (Use a minimum orifice size of 3/8 inch to avoid clogging.):

Equation B-3

Where

D = orifice diameter (in)

y = distance from the lowest elevation of the storage volume

TABLE 1. *Continued*

to drain in 12 hours (ft³)

In previous versions of this manual, UDFCD recommended that the underdrain be placed in an aggregate layer and that a geotextile (separator fabric) be placed between this aggregate and the growing medium. This version of the manual replaces that section with materials that, when used together, eliminate the need for a separator fabric.

The underdrain system should be placed within an 6-inch-thick section of CDOT Class B or Class C filter material meeting the gradation in Table B-1. Use slotted pipe that meets the slot dimensions provided in Table B-3.

B-7

Bioretention

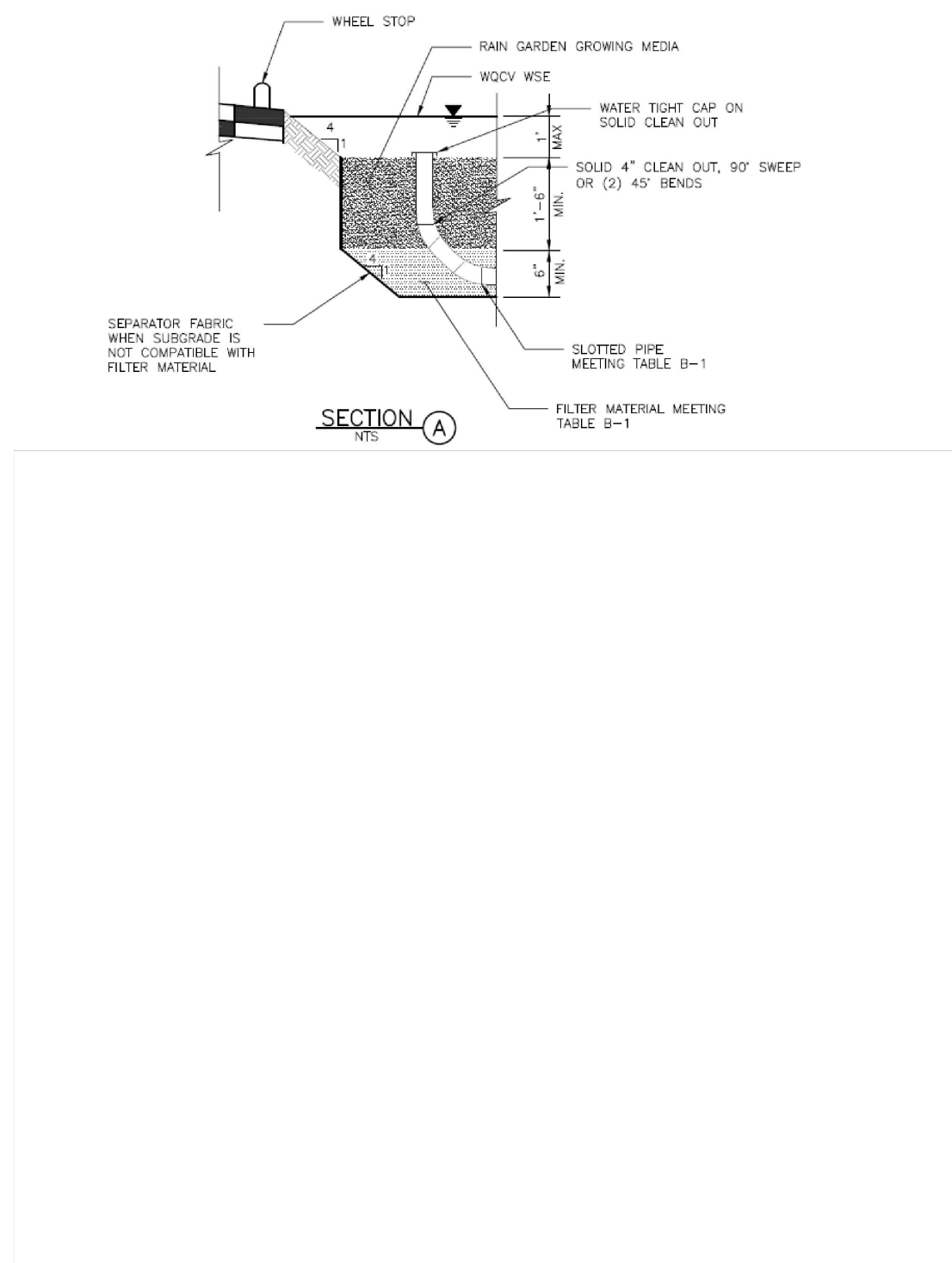
| Common Name | Scientific Name | Variety | PLS ² lbs per Acre | Ounces per Acre |
|-----------------------------------|-------------------------------|-----------|-------------------------------------|-----------------------|
| Sand bluestem | Andropogon hallii | Garden | 3.5 | |
| Sideoats grama | Bouteloua curtipendula | Butte | 3 | |
| Prairie sandreed | Calamovilfa longifolia | Goshen | 3 | |
| Indian ricegrass | Oryzopsis hymenoides | Paloma | 3 | |
| Switchgrass | Panicum virgatum | Blackwell | 4 | |
| Western wheatgrass | Pascopyrum smithii | Ariba | 3 | |
| Little bluestem | Schizachyrium scoparium | Putura | 3 | |
| Alkali sacaton | Sporobolus airoides | | 3 | |
| Sand dropseed | Sporobolus cryptandrus | | 3 | |
| Pasture sage ¹ | Artemisia frigida | | | 2 |
| Blue aster ¹ | Aster laevis | | | 4 |
| Blanket flower ¹ | Gaillardia aristata | | | 8 |
| Prairie coneflower ¹ | Ratibida columnifera | | | 4 |
| Purple prairieclover ¹ | Dalea (Petalostemum) purpurea | | | 4 |
| Sub-Totals: | | | 27.5 | 22 |
| Total lbs per acre: | | | 28.9 | |

¹ Wildflower seed (optional) for a more diverse and natural look.

² PLS = Pure Live Seed.

November 2015

Bioretention



November 2018

