

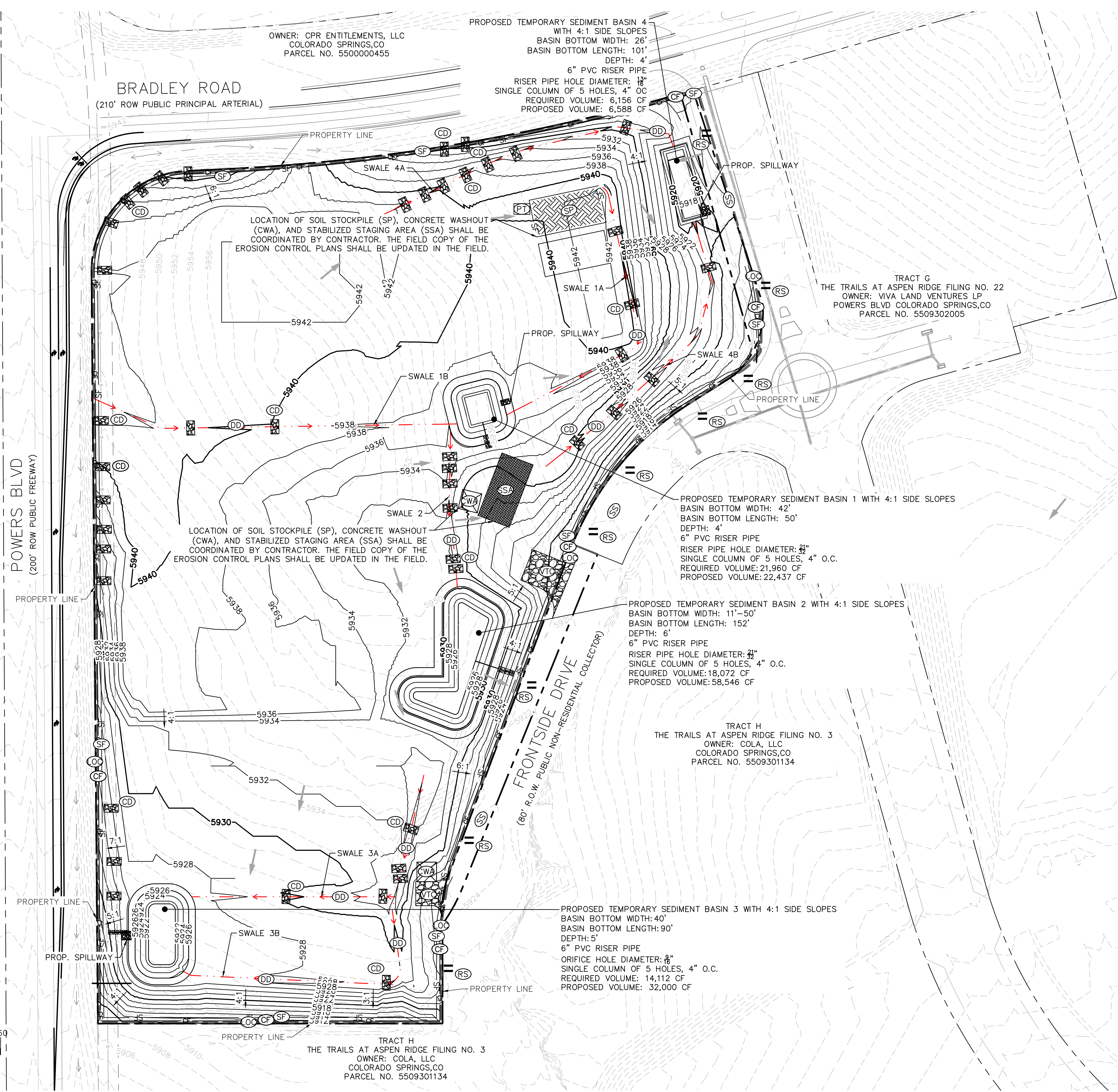
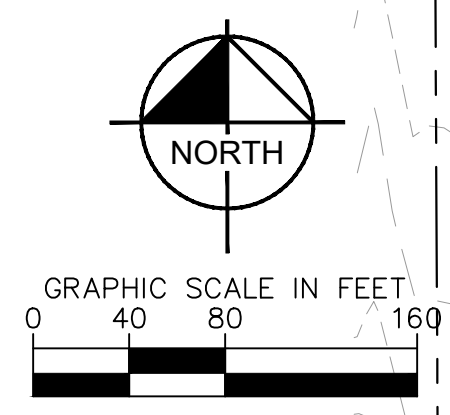


**LEGEND**

---	PROPERTY LINE
6550	EXISTING MAJOR CONTOUR
6551	EXISTING MINOR CONTOUR
6551	PROPOSED MAJOR CONTOUR
6551	PROPOSED MINOR CONTOUR
OP	LIMITS OF CONSTRUCTION/DISTURBANCE
SF	SILT FENCE
---	EASEMENT
S	EXISTING SANITARY SEWER
W	EXISTING WATER LINE
---	EXISTING STORM SEWER PIPE
FO	EXISTING FIBER OPTIC LINE
G	EXISTING GAS LINE
OH	EXISTING OVERHEAD ELECTRIC LINE
O	EXISTING BARBED WIRE FENCE
	ROCK SOCKS PER UDFCD DETAIL SC-5
SSA	STABILIZED STAGING AREA
CWA	CONCRETE WASHOUT
CD	CHECK DAM
DD	DIVERSION DITCH
VTC	VEHICLE TRACKING CONTROL
SP	SOIL STOCKPILE
IP	INLET PROTECTION
CIP	CULVERT INLET PROTECTION
→	EXISTING FLOW DIRECTION ARROW
→	PROPOSED FLOW DIRECTION ARROW
SS	STREET SWEEPING AND VACUUMING PER UDFCD DETAIL SM-7
DC	DUST CONTROL PER UDFCD DETAIL EC-14
PT	PORTABLE TOILET

**NOTES**

1. THE INTENT OF THIS PLAN IS TO IDENTIFY THE EROSION CONTROL PRACTICES RECOMMENDED. THE CONTRACTOR SHALL REFERENCE ADDITIONAL CONSTRUCTION PLANS FOR DEMOLITION OF EXISTING AND CONSTRUCTION OF PROPOSED IMPROVEMENTS.
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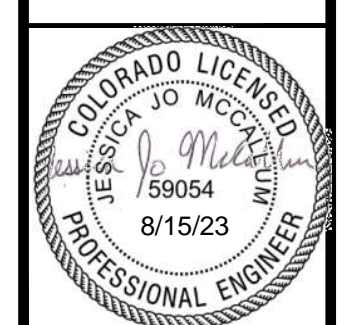


NO.	REVISION	BY	DATE	APPR

**Kimley»Horn**  
2023 KIMLEY-HORN AND ASSOCIATES, INC.  
2 North Nevada Avenue, Suite 900  
Colorado Springs, Colorado 80903 (719) 453-0180

DESIGNED BY: JJM  
DRAWN BY: JJM  
CHECKED BY: JJM  
DATE: 8/15/2023

**WATERVIEW EAST COMMERCIAL  
GRADING AND EROSION CONTROL PLANS  
GEC INITIAL PLAN**



PROJECT NO.  
196195000

SHEET  
**C 3.1**

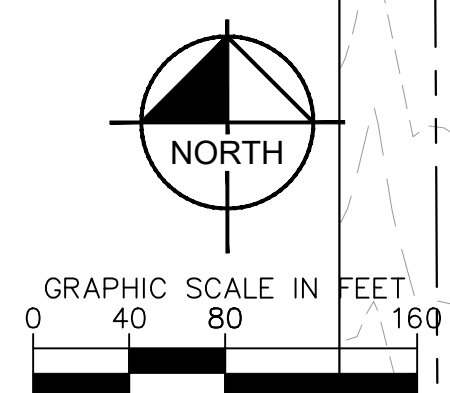
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**LEGEND**

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6550	EXISTING MAJOR CONTOUR
6551	EXISTING MINOR CONTOUR
6550	PROPOSED MAJOR CONTOUR
6551	PROPOSED MINOR CONTOUR
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SF	SILT FENCE
SC	SEDIMENT CONTROL LOGS
E	EASEMENT
S	EXISTING SANITARY SEWER
W	EXISTING WATER LINE
FO	EXISTING STORM SEWER PIPE
G	EXISTING FIBER OPTIC LINE
OH	EXISTING OVERHEAD ELECTRIC LINE
O	EXISTING BARBED WIRE FENCE
RS	ROCK SOCKS PER UDFCD DETAIL SC-5
SSA	STABILIZED STAGING AREA
CWA	CONCRETE WASHOUT
CD	CHECK DAM
DD	DIVERSION DITCH
VTC	VEHICLE TRACKING CONTROL
SP	SOIL STOCKPILE
IP	INLET PROTECTION
CIP	CULVERT INLET PROTECTION
→	EXISTING FLOW DIRECTION ARROW
→	PROPOSED FLOW DIRECTION ARROW
SS	STREET SWEEPING AND VACUUMING PER UDFCD DETAIL SM-7
DC	DUST CONTROL PER UDFCD DETAIL EC-14
TS	TEMPORARY SEEDING
SR	SURFACE ROUGHENING
---	CUT/FILL BOUNDARY

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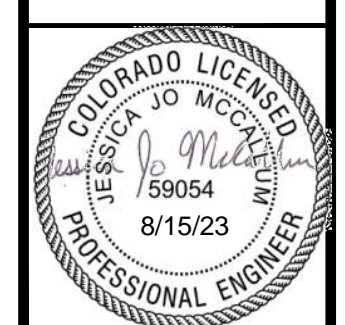


NO.	REVISION	BY	DATE

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DESIGNED BY: JJM  
 DRAWN BY: JJM  
 CHECKED BY: JJM  
 DATE: 8/15/2023

**WATERVIEW EAST COMMERCIAL  
 GRADING AND EROSION CONTROL PLANS  
 GEC INTERIM PLAN**



PROJECT NO.  
196195000  
 SHEET  
**C 3.2**

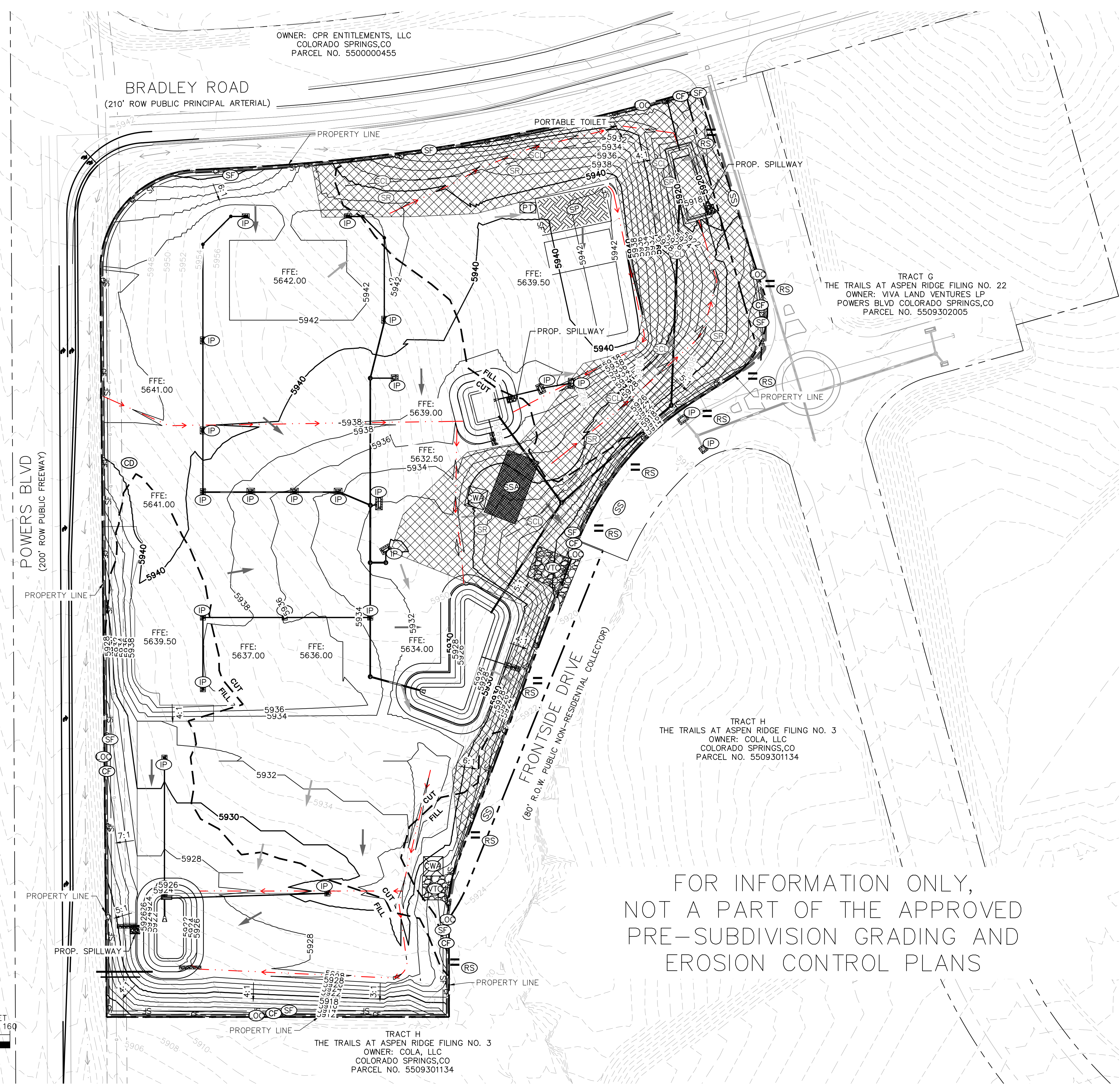
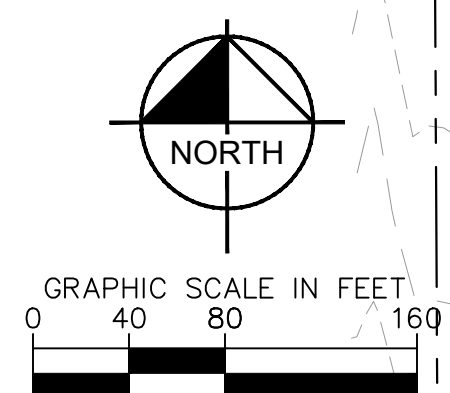
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**LEGEND**

- 6550 --- PROPERTY LINE
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- O --- EXISTING OVERHEAD ELECTRIC LINE
- O --- EXISTING BARBED WIRE FENCE
- (RS) --- ROCK SOCKS PER UDFCD DETAIL SC-5
- (SSA) --- STABILIZED STAGING AREA
- (CWA) --- CONCRETE WASHOUT
- (CD) --- CHECK DAM
- (DD) --- DIVERSION DITCH
- (VTC) --- VEHICLE TRACKING CONTROL
- (SP) --- SOIL STOCKPILE
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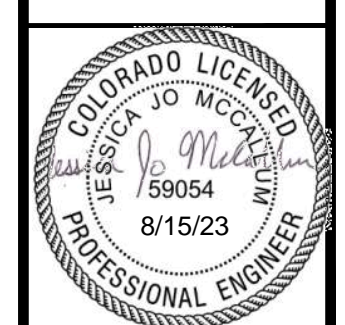
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NOT A PART OF THE APPROVED  
PRE-SUBDIVISION GRADING AND  
EROSION CONTROL PLANS

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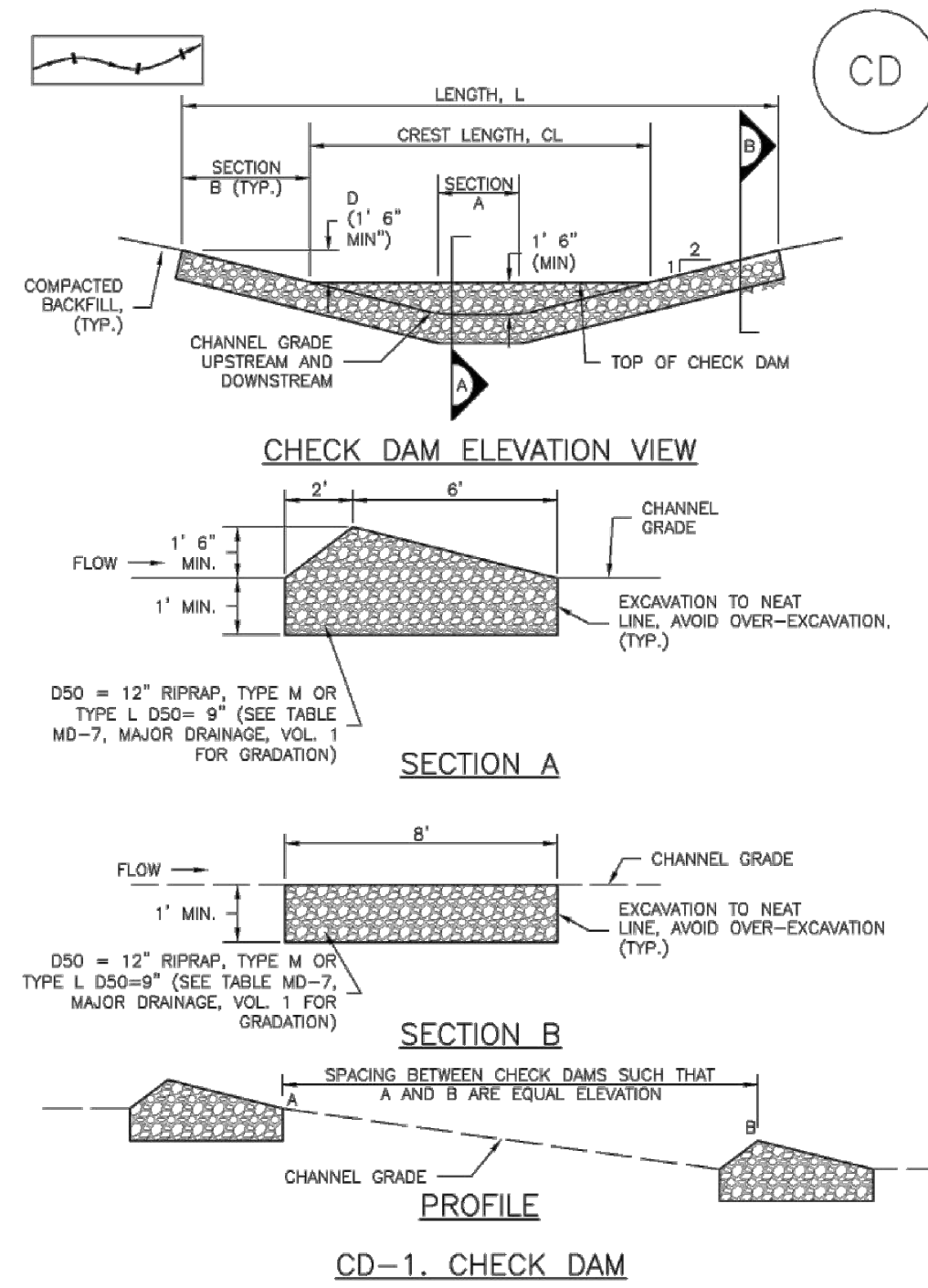
WATERVIEW EAST COMMERCIAL  
GRADING AND EROSION CONTROL PLANS  
GEC FINAL PLAN



PROJECT NO.  
196195000  
SHEET  
**C 3.3**

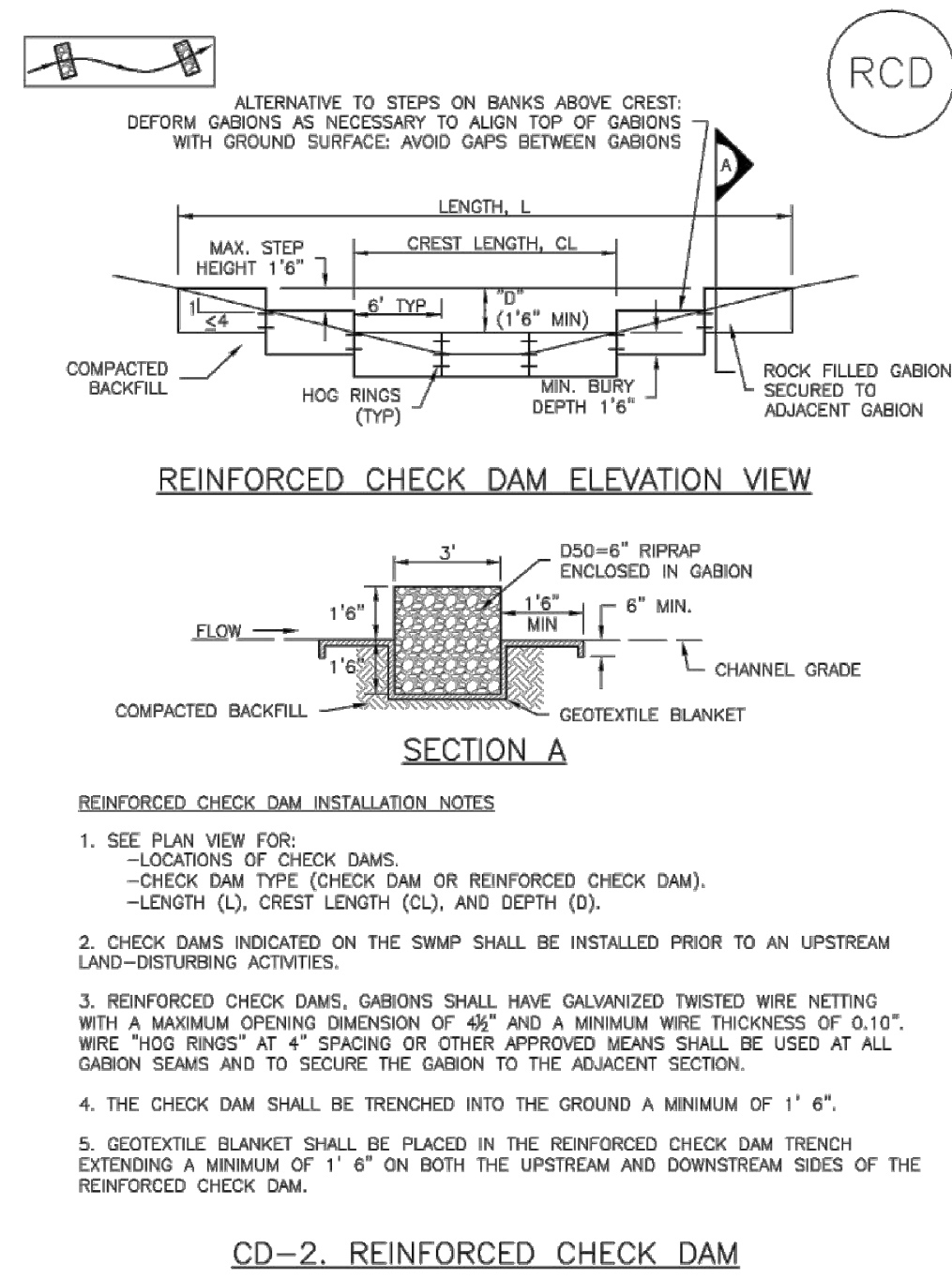
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**Check Dams (CD) EC-12**



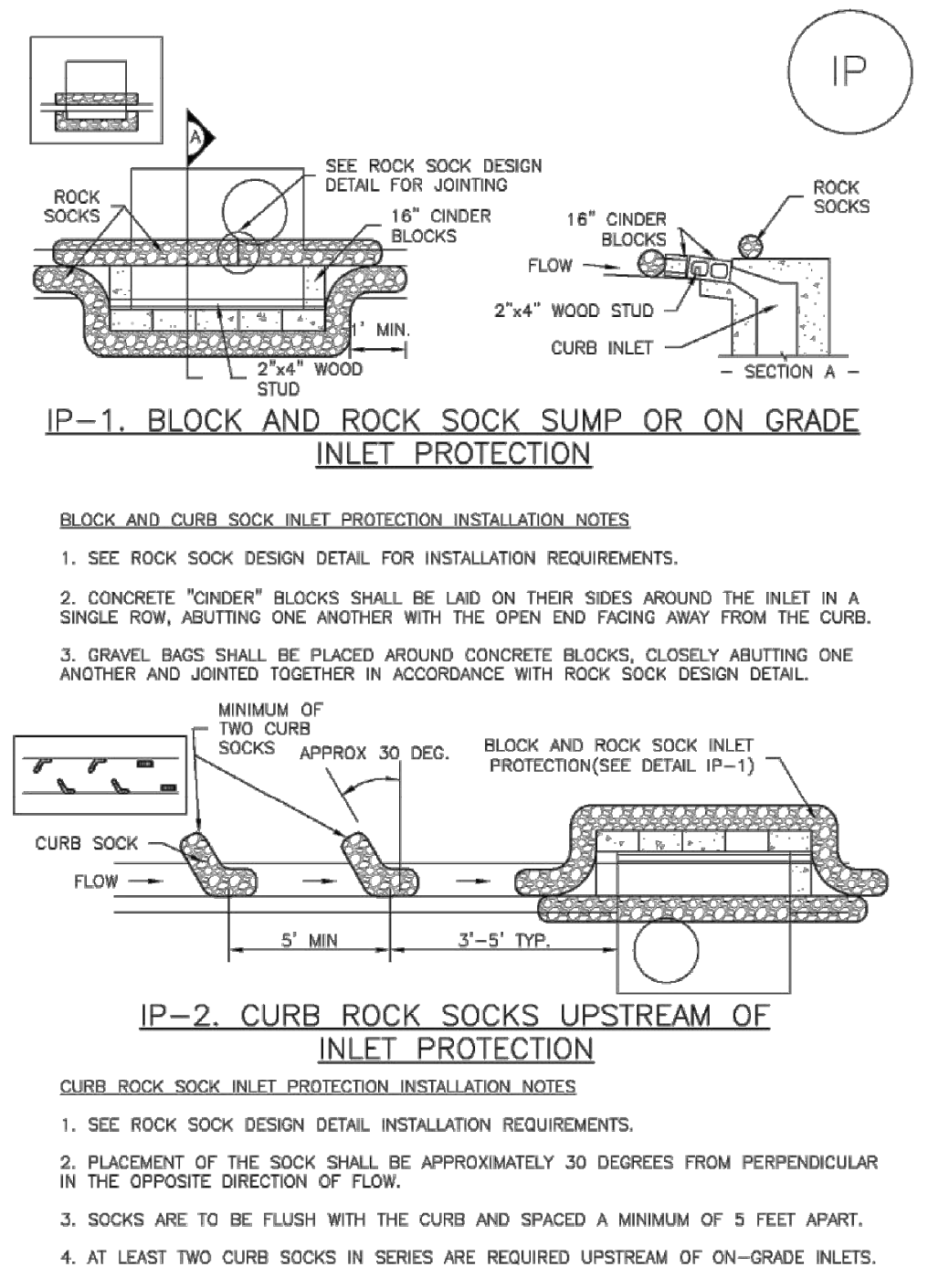
November 2010 Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual Volume 3 CD-3

**Check Dams (CD) EC-12**



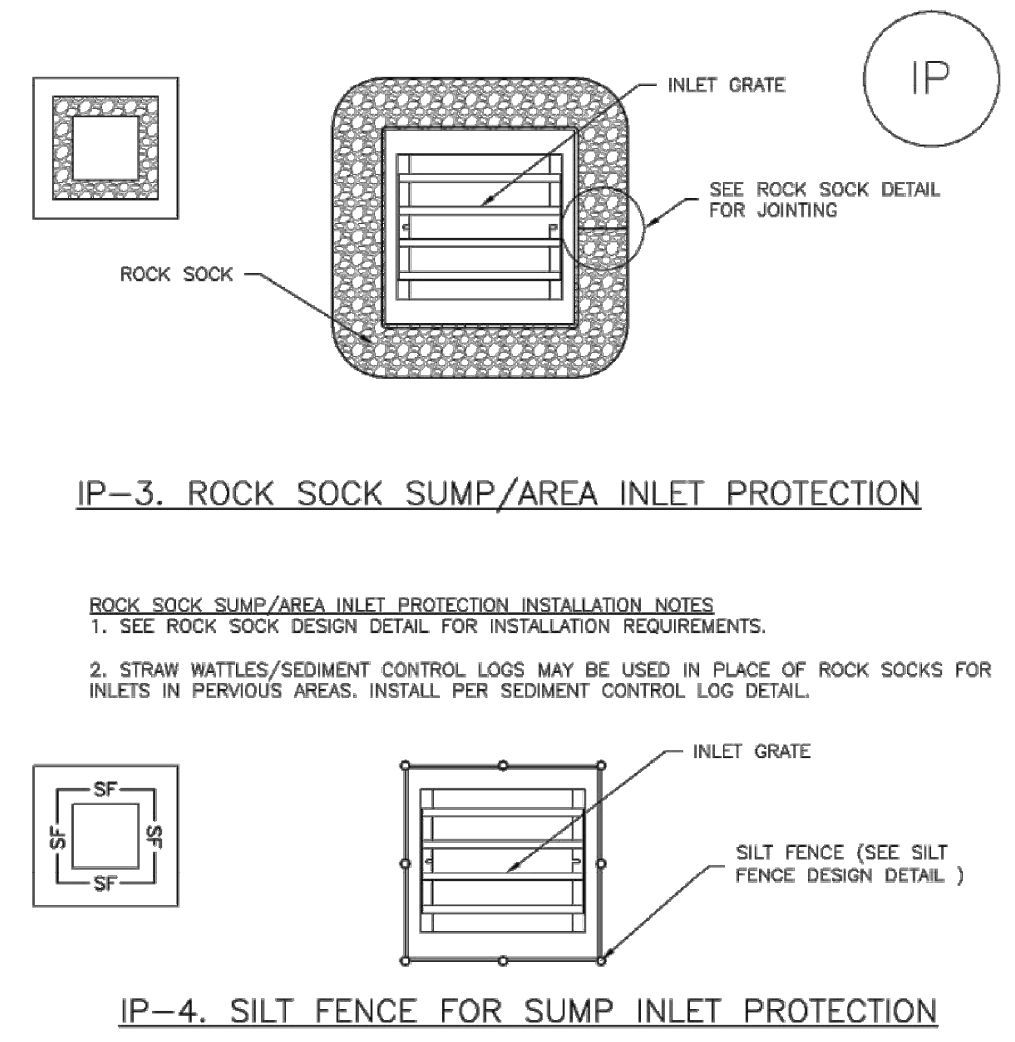
November 2010 Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual Volume 3 CD-5

**SC-6 Inlet Protection (IP)**



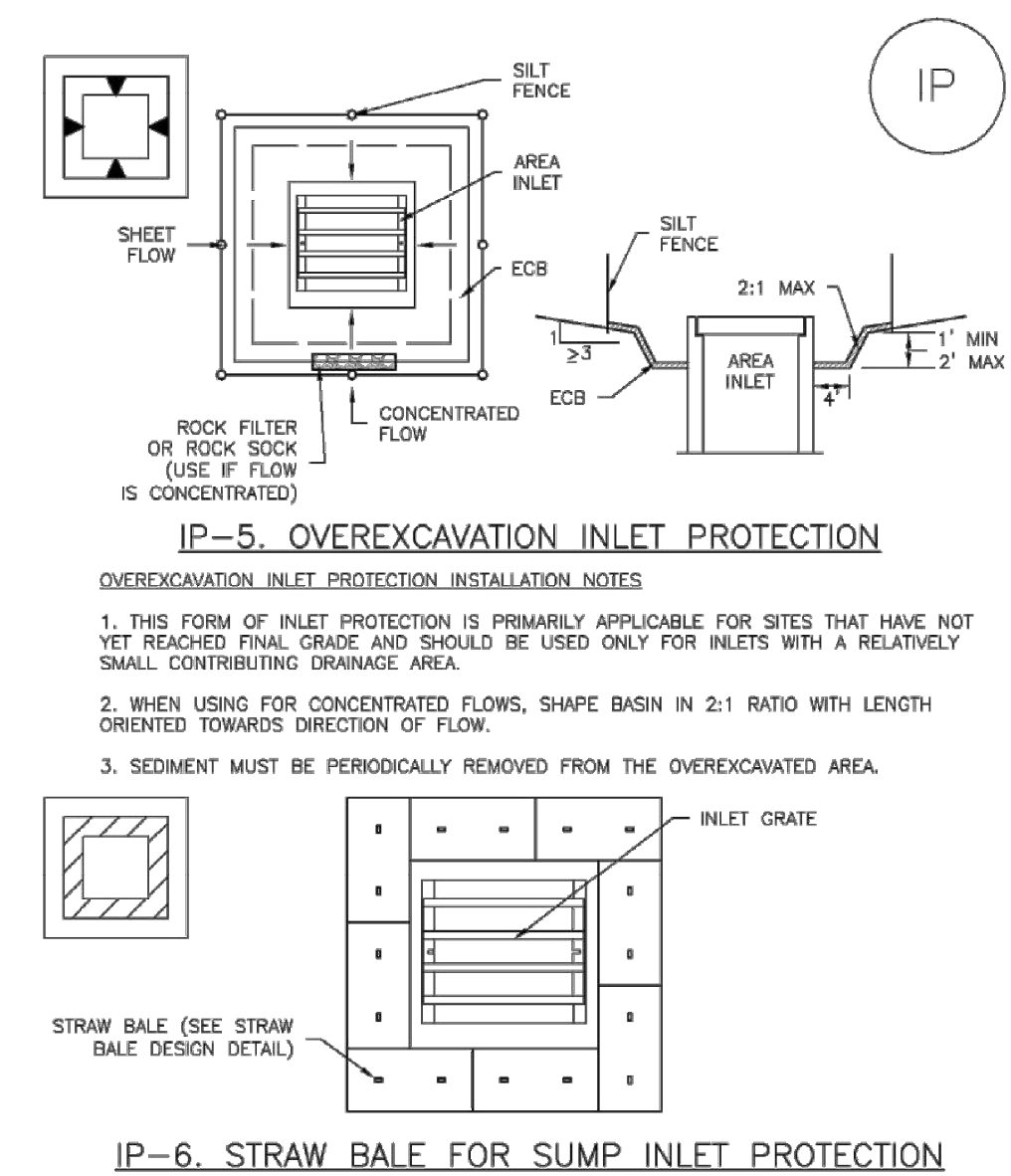
IP-4 August 2013 Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual Volume 3

**Inlet Protection (IP) SC-6**



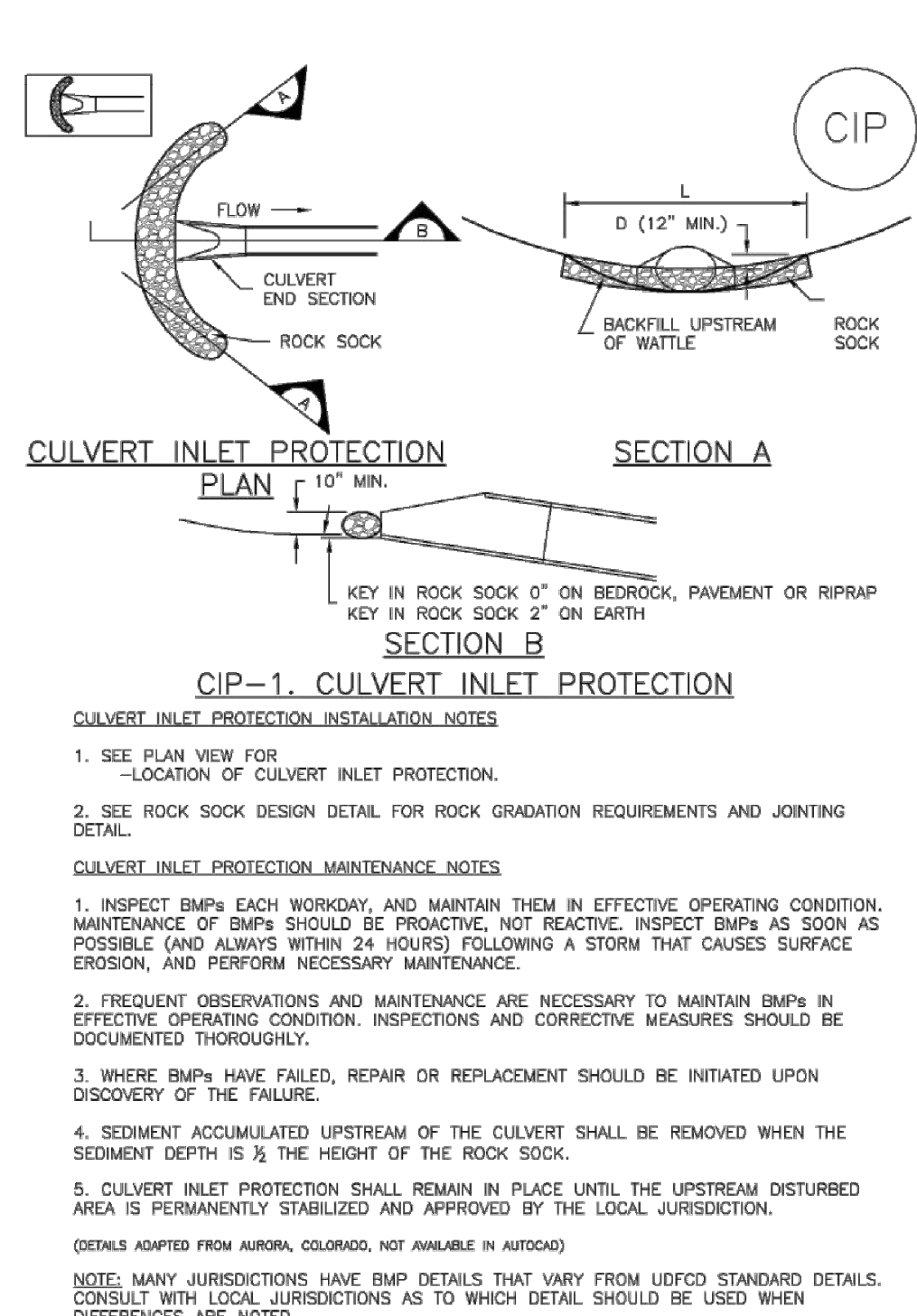
August 2013 Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual Volume 3 IP-5

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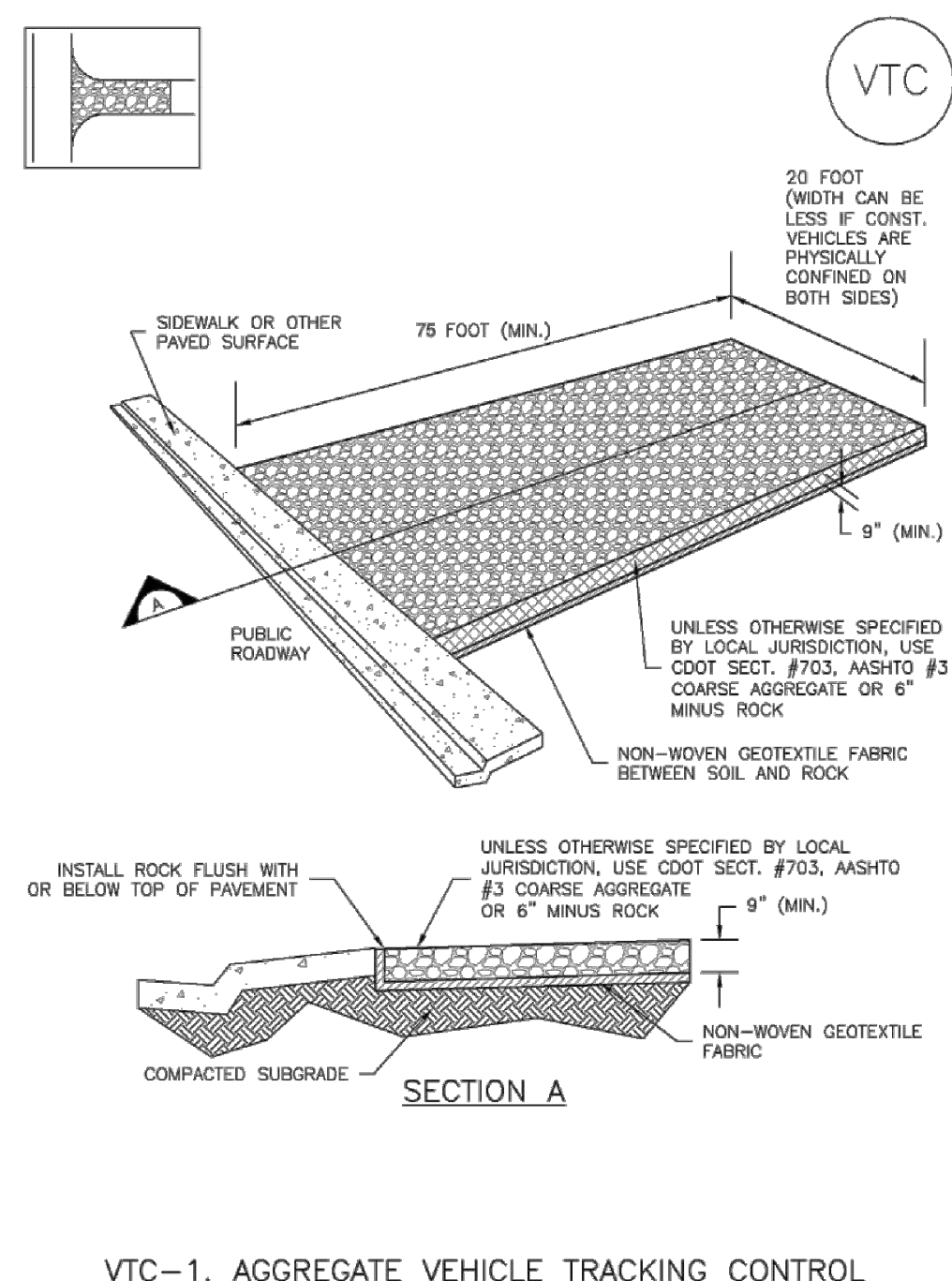
IP-6 August 2013 Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual Volume 3

**Inlet Protection (IP) SC-6**



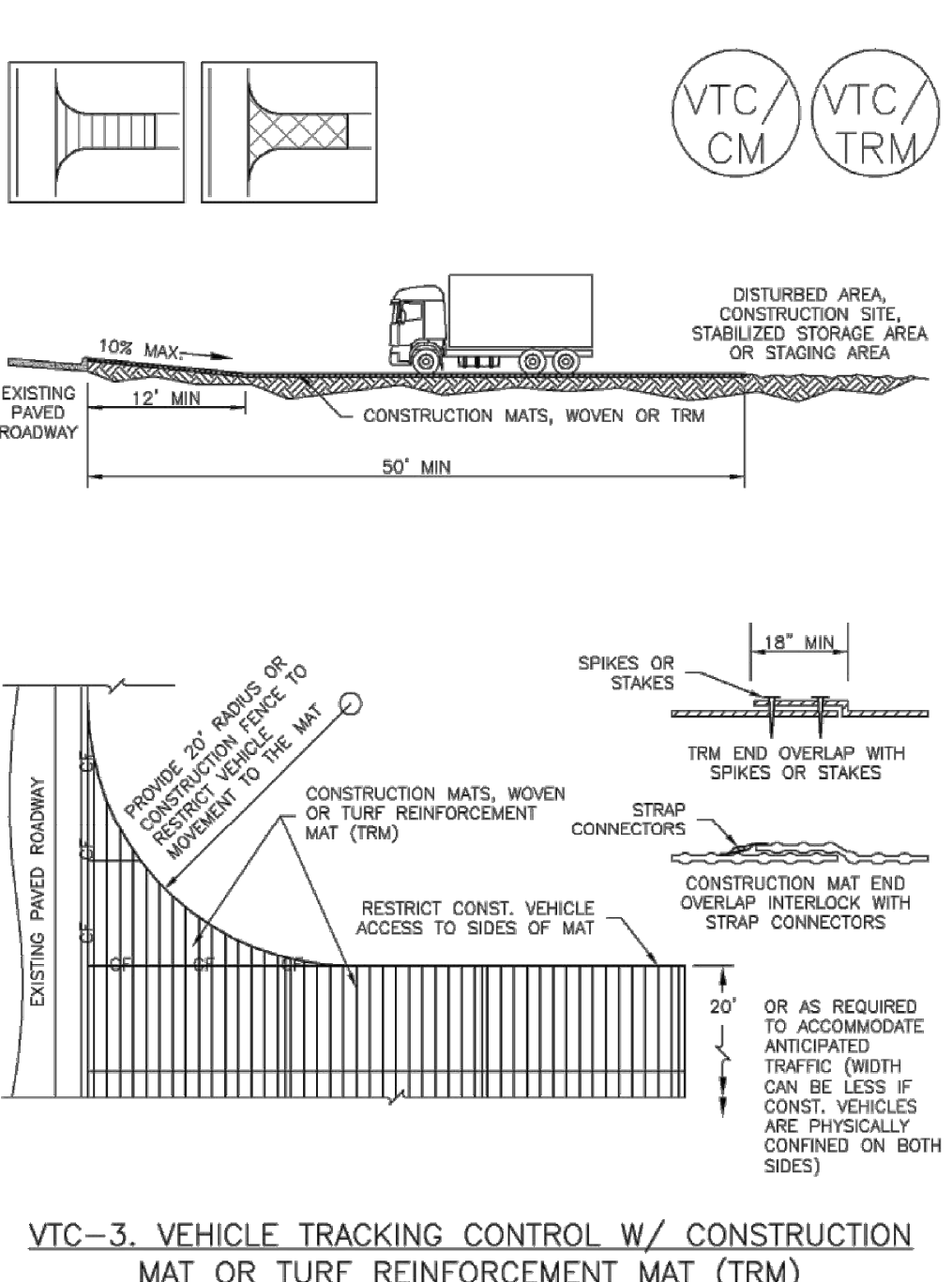
August 2013 Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual Volume 3 IP-7

**Vehicle Tracking Control (VTC) SM-4**



VTC-3 November 2010 Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual Volume 3

**Vehicle Tracking Control (VTC) SM-4**



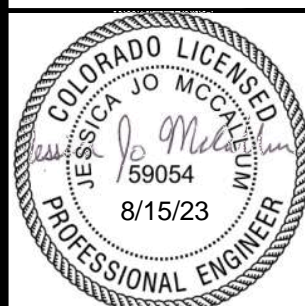
VTC-3 November 2010 Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual Volume 3

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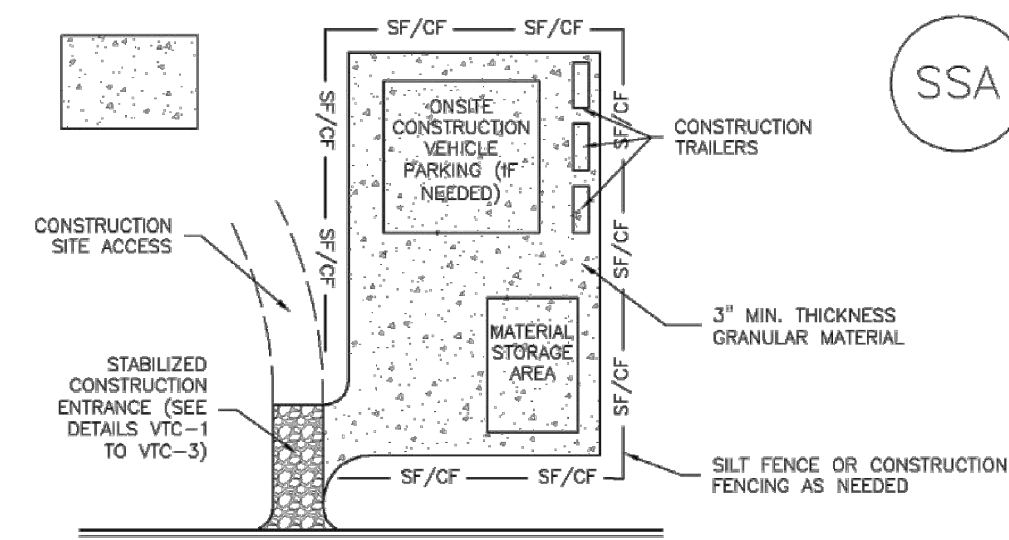
**WATERVIEW EAST COMMERCIAL  
 GRADING AND EROSION CONTROL PLANS  
 GEC DETAILS (1 OF 4)**



PROJECT NO.  
 196195000  
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**C 3.4**

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**Stabilized Staging Area (SSA) SM-6**



**SSA-1. STABILIZED STAGING AREA**

**STABILIZED STAGING AREA INSTALLATION NOTES**

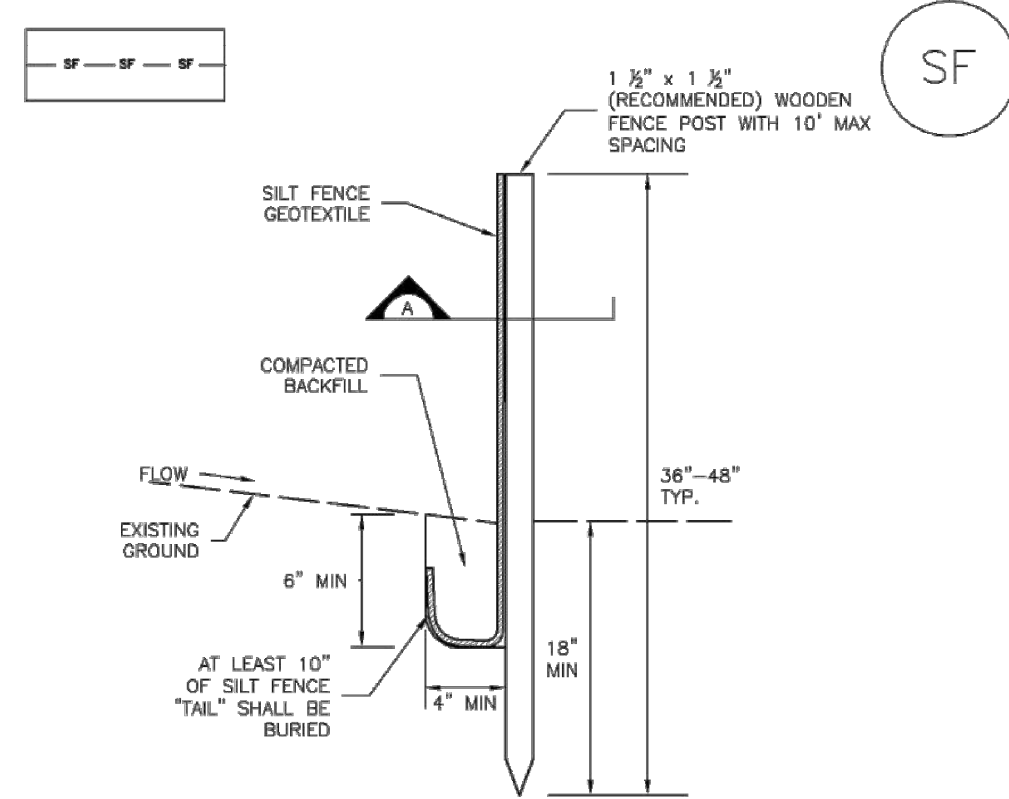
- SEE PLAN VIEW FOR:
  - LOCATION OF STAGING AREA(S).
  - CONTRACTOR MAY ADJUST LOCATION AND SIZE OF STAGING AREA WITH APPROVAL FROM THE LOCAL JURISDICTION.
- STABILIZED STAGING AREA SHOULD BE APPROPRIATE FOR THE NEEDS OF THE SITE. OVERSIZING RESULTS IN A LARGER AREA TO STABILIZE FOLLOWING CONSTRUCTION.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

**STABILIZED STAGING AREA MAINTENANCE NOTES**

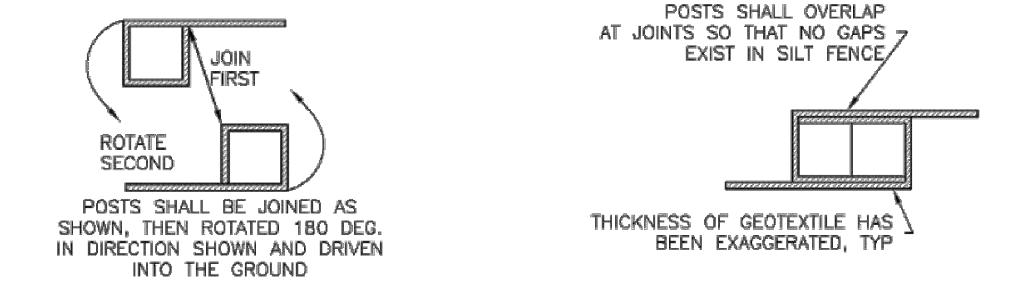
- INSPECT BMPs EACH WORKDAY AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.
- FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
- WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.
- ROCK SHALL BE REAPPLIED OR REGRADED AS NECESSARY IF RUTTING OCCURS OR UNDERLYING SUBGRADE BECOMES EXPOSED.

November 2010 Urban Drainage and Flood Control District SSA-3  
Urban Storm Drainage Criteria Manual Volume 3

**Silt Fence (SF) SC-1**



**SILT FENCE**

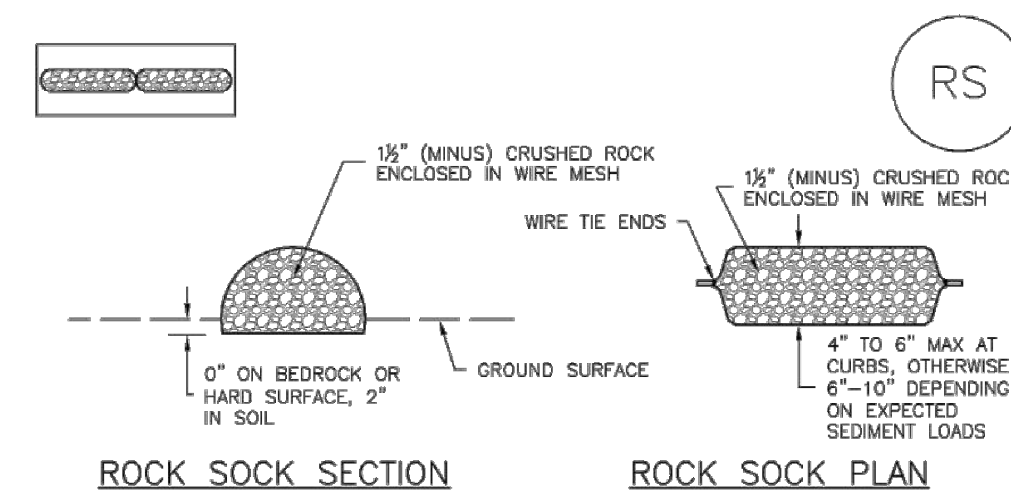


**SECTION A**

**SF-1. SILT FENCE**

November 2010 Urban Drainage and Flood Control District SF-3  
Urban Storm Drainage Criteria Manual Volume 3

**Rock Sock (RS) SC-5**



**ROCK SOCK SECTION**

**ROCK SOCK PLAN**

ANY GAP AT JOINT SHALL BE FILLED WITH AN ADEQUATE AMOUNT OF 1/2" (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.

**ROCK SOCK JOINTING**

**GRADATION TABLE**

SI-E SIZE	MASS PERCENT PASSING SQUARE MESH SIEVES
NO. 4	100
2"	90 - 100
1 1/2"	20 - 55
1"	0 - 15
3/4"	0 - 5
3/8"	0 - 5

**MATCHES SPECIFICATIONS FOR NO. 4 COARSE AGGREGATE FOR CONCRETE PER AASHTO M43. ALL ROCK SHALL BE FRACTURED FACE, ALL SIDES.**

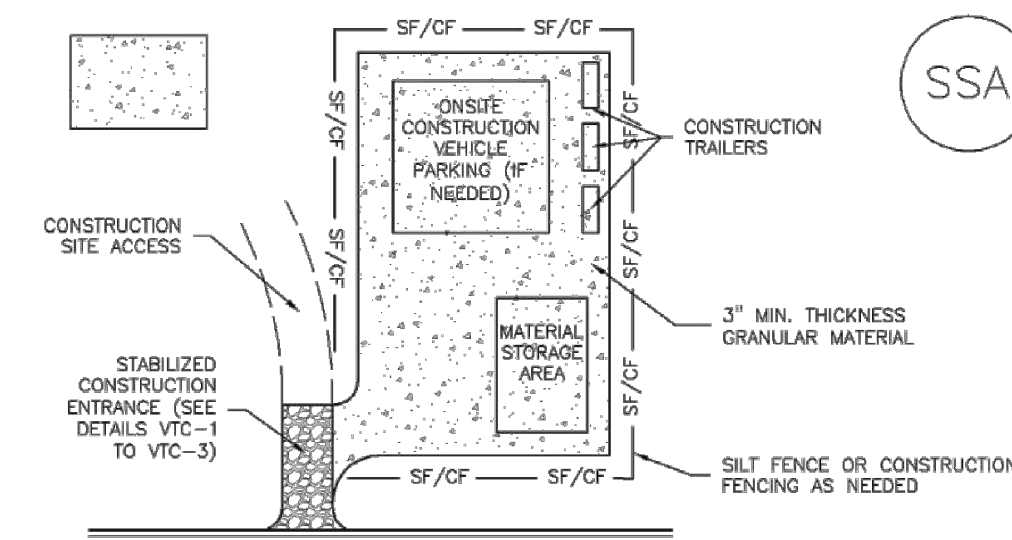
**ROCK SOCK INSTALLATION NOTES**

- SEE PLAN VIEW FOR:
  - LOCATION(S) OF ROCK SOCKS.
- CRUSHED ROCK SHALL BE 1/2" (MINUS) IN SIZE WITH A FRACTURED FACE (ALL SIDES) AND SHALL COMPLY WITH GRADATION SHOWN ON THIS SHEET (1 1/2" MINUS).
- WIRE MESH SHALL BE FABRICATED OF 10 GAUGE POLYURETHANE MESH, OR EQUIVALENT, WITH A MAXIMUM OPENING OF 1/2", RECOMMENDED MINIMUM ROLL WIDTH OF 48"
- WIRE MESH SHALL BE SECURED USING "HOC RINGS" OR WIRE TIES AT 6" CENTERS ALONG ALL JOINTS AND AT 2" CENTERS ON ENDS OF SOCKS.
- 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**

RS-2 Urban Drainage and Flood Control District November 2010  
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**Stabilized Staging Area (SSA) SM-6**



**SSA-1. STABILIZED STAGING AREA**

**STABILIZED STAGING AREA INSTALLATION NOTES**

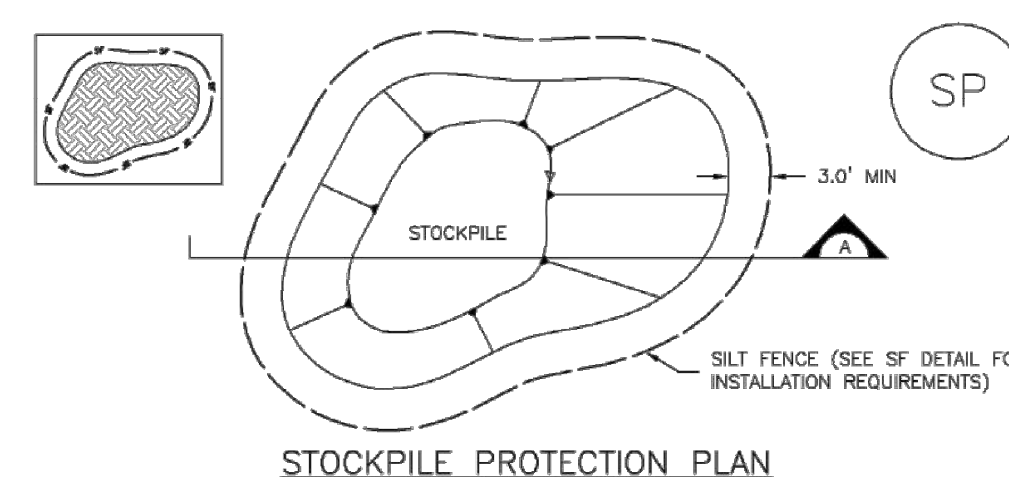
- SEE PLAN VIEW FOR:
  - LOCATION OF STAGING AREA(S).
  - CONTRACTOR MAY ADJUST LOCATION AND SIZE OF STAGING AREA WITH APPROVAL FROM THE LOCAL JURISDICTION.
- STABILIZED STAGING AREA SHOULD BE APPROPRIATE FOR THE NEEDS OF THE SITE. OVERSIZING RESULTS IN A LARGER AREA TO STABILIZE FOLLOWING CONSTRUCTION.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

**STABILIZED STAGING AREA MAINTENANCE NOTES**

- 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.
- FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
- WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.
- ROCK SHALL BE REAPPLIED OR REGRADED AS NECESSARY IF RUTTING OCCURS OR UNDERLYING SUBGRADE BECOMES EXPOSED.

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**Stockpile Management (SP) MM-2**



**STOCKPILE PROTECTION PLAN**

**SECTION A**

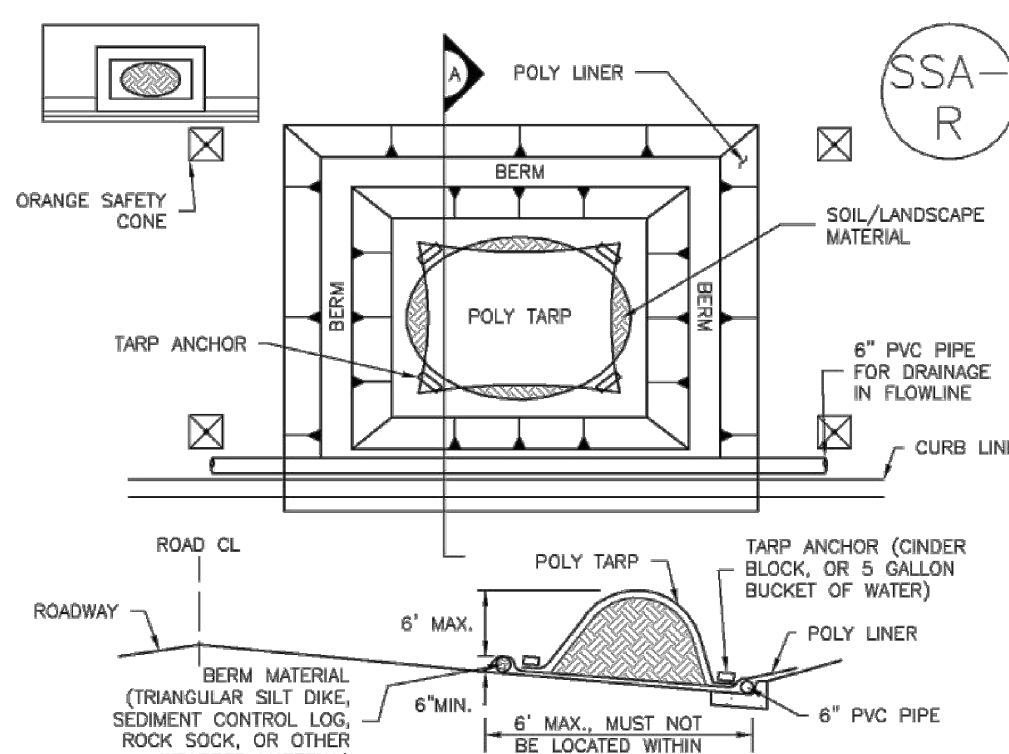
**SP-1. STOCKPILE PROTECTION**

**STOCKPILE PROTECTION INSTALLATION NOTES**

- SEE PLAN VIEW FOR:
  - TYPE OF STOCKPILE PROTECTION.
- INSTALL PERIMETER CONTROLS IN ACCORDANCE WITH THEIR RESPECTIVE DESIGN DETAILS. SILT FENCE IS SHOWN IN THE STOCKPILE PROTECTION DETAILS; HOWEVER, OTHER TYPES OF PERIMETER CONTROLS INCLUDING SEDIMENT CONTROL LOGS OR ROCK SOCKS MAY BE SUITABLE IN SOME CIRCUMSTANCES. CONSIDERATIONS FOR DETERMINING THE APPROPRIATE TYPE OF PERIMETER CONTROL FOR A STOCKPILE INCLUDE WHETHER THE STOCKPILE IS LOCATED ON A PAVEMENT OR IMPERVIOUS SURFACE, THE RELATIVE HEIGHTS OF THE PERIMETER CONTROL AND STOCKPILE, THE ABILITY OF THE PERIMETER CONTROL TO CONTAIN THE STOCKPILE WITHOUT FAILING IN THE EVENT THAT MATERIAL FROM THE STOCKPILE SHIFTS OR SLUMPS AGAINST THE PERIMETER, AND OTHER FACTORS.
- STABILIZE THE STOCKPILE SURFACE WITH SURFACE ROUGHENING, TEMPORARY SEEDING AND MULCHING, EROSION CONTROL BLANKETS, OR SOIL BINDERS. SOILS STOCKPILED FOR AN EXTENDED PERIOD (TYPICALLY FOR MORE THAN 60 DAYS) SHOULD BE SEEDING AND MULCHED WITH A TEMPORARY GRASS COVER ONCE THE STOCKPILE IS PLACED (TYPICALLY WITHIN 14 DAYS). USE OF MULCH ONLY OR A SOIL BINDER IS ACCEPTABLE IF THE STOCKPILE WILL BE IN PLACE FOR A MORE LIMITED TIME PERIOD (TYPICALLY 30-60 DAYS).
- FOR TEMPORARY STOCKPILES ON THE INTERIOR PORTION OF A CONSTRUCTION SITE, WHERE OTHER CONCURRENT CONTROLS, INCLUDING PERIMETER CONTROL, ARE IN PLACE, STOCKPILE PERIMETER CONTROLS MAY NOT BE REQUIRED.

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**Stockpile Management (SP) MM-2**



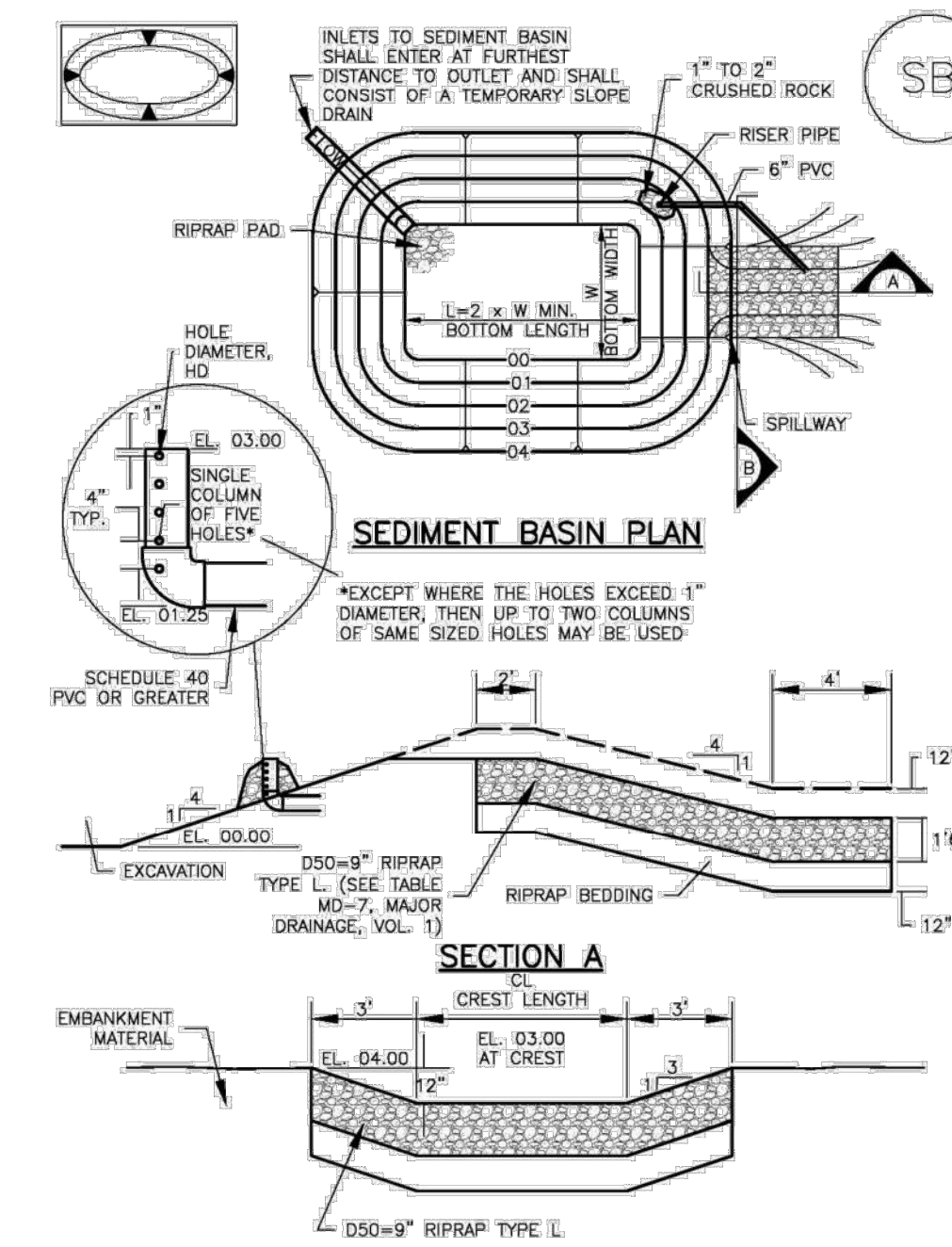
**SP-2. MATERIALS STAGING IN ROADWAY**

**MATERIALS STAGING IN ROADWAYS INSTALLATION NOTES**

- SEE PLAN VIEW FOR:
  - LOCATION OF MATERIAL STAGING AREA(S).
  - CONTRACTOR MAY ADJUST LOCATION AND SIZE OF STAGING AREA WITH APPROVAL FROM THE LOCAL JURISDICTION.
- FEATURE MUST BE INSTALLED PRIOR TO EXCAVATION, EARTHWORK OR DELIVERY OF MATERIALS.
- MATERIALS MUST BE STATIONED ON THE POLY LINER. ANY INCIDENTAL MATERIALS DEPOSITED ON PAVED SECTION OR ALONG CURB LINE MUST BE CLEANED UP PROMPTLY.
- POLY LINER AND TARP COVER SHOULD BE OF SIGNIFICANT THICKNESS TO PREVENT DAMAGE OR LOSS OF INTEGRITY.
- SAND BAGS MAY BE SUBSTITUTED TO ANCHOR THE COVER TARP OR PROVIDE BERMING UNDER THE BASE LINER.
- FEATURE IS NOT INTENDED FOR USE WITH WET MATERIAL THAT WILL BE DRAINING AND/OR SPREADING OUT ON THE POLY LINER OR FOR DEMOLITION MATERIALS.
- THIS FEATURE CAN BE USED FOR:
  - UTILITY REPAIRS.
  - WHEN OTHER STAGING LOCATIONS AND OPTIONS ARE LIMITED.
  - OTHER LIMITED APPLICATION AND SHORT DURATION STAGING.

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**Sediment Basin (SB) SC-7**



**SEDIMENT BASIN PLAN**

**SECTION A**

**TABLE SB-1. SIZING INFORMATION FOR STANDARD SEDIMENT BASIN**

Upstream Drainage Area (rounded to nearest acre), (ac)	Basin Bottom Width (W), (ft)	Spillway Crest Length (CL), (ft)	Hole Diameter (HD), (in)
1	12 1/2	2	3/8
2	21	3	1/2
3	29	5	3/4
4	33 1/2	6	3/4
5	38 1/2	8	3/4
6	43	9	3/4
7	47 1/2	11	3/4
8	55	12	3/4
10	58 1/2	15	3/4
11	61	16	3/4
12	64	18	3/4
13	70 1/2	19	1 1/8
14	70 1/2	21	1 1/8
15	73 1/2	22	1 1/8

**SEDIMENT BASIN INSTALLATION NOTES**

- SEE PLAN VIEW FOR:
  - LOCATION OF SEDIMENT BASIN.
  - TYPE OF BASIN (STANDARD BASIN OR NONSTANDARD BASIN).
  - FOR STANDARD BASIN, BOTTOM WIDTH W, CREST LENGTH CL, AND HOLE DIAMETER, HD.
  - FOR NONSTANDARD BASIN, SEE CONSTRUCTION DRAWINGS FOR DESIGN OF BASIN INCLUDING RISER HEIGHT H, NUMBER OF COLUMNS N, HOLE DIAMETER HD AND PIPE DIAMETER D.
- FOR STANDARD BASIN, BOTTOM DIMENSION MAY BE MODIFIED AS LONG AS BOTTOM AREA IS NOT REDUCED.
- SEDIMENT BASINS SHALL BE INSTALLED PRIOR TO ANY OTHER LAND-DISTURBING ACTIVITY THAT RELIES ON ON BASINS AS A STORMWATER CONTROL.
- EMBANKMENT MATERIAL SHALL CONSIST OF SOIL FREE OF DEBRIS, ORGANIC MATERIAL, AND ROCKS OR CONCRETE GREATER THAN 3 INCHES AND SHALL HAVE A MINIMUM OF 15 PERCENT BY WEIGHT PASSING THE NO. 200 SIEVE.
- EMBANKMENT MATERIAL SHALL BE COMPACTED TO AT LEAST 95 PERCENT OF MAXIMUM DENSITY IN ACCORDANCE WITH ASTM D698.
- PIPE SCH 40 OR GREATER SHALL BE USED.
- THE DETAILS SHOWN ON THESE SHEETS PERTAIN TO STANDARD SEDIMENT BASIN(S) FOR DRAINAGE AREAS LESS THAN 15 ACRES. SEE CONSTRUCTION DRAWINGS FOR EMBANKMENT, STORAGE VOLUME, SPILLWAY, OUTLET, AND OUTLET PROTECTION DETAILS FOR ANY SEDIMENT BASIN(S) THAT HAVE BEEN INDIVIDUALLY DESIGNED FOR DRAINAGE AREAS LARGER THAN 15 ACRES.

August 2013 Urban Drainage and Flood Control District SB-5  
Urban Storm Drainage Criteria Manual Volume 3

SB-6 Urban Drainage and Flood Control District August 2013  
Urban Storm Drainage Criteria Manual Volume 3

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DRAWN BY: JJM  
CHECKED BY: JJM  
DATE: 8/15/2023

**WATERVIEW EAST COMMERCIAL  
GRADING AND EROSION CONTROL PLANS  
GEC DETAILS (2 OF 4)**



PROJECT NO.  
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**Temporary and Permanent Seeding (TS/PS) EC-2**

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* (Common name)	Growth Season	Pounds of Pure Live Seed (PLS)/acre	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

\* 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.

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

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

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

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

Common Name	Botanical Name	Growth Season	Growth Form	Seeds/Pound	Pounds of PLS/Acre
<b>Alkali Soil Seed Mix</b>					
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
Sodar streambank wheatgrass	<i>Agropyron riparium 'Sodas'</i>	Cool	Sod	170,000	2.5
Jose tall wheatgrass	<i>Agropyron elongatum 'Jose'</i>	Cool	Bunch	79,000	7.0
Arriba western wheatgrass	<i>Agropyron smithii 'Arriba'</i>	Cool	Sod	110,000	5.5
<b>Total</b>					<b>17.75</b>
<b>Fertile Loamy Soil Seed Mix</b>					
Ephrium crested wheatgrass	<i>Agropyron cristatum 'Ephrium'</i>	Cool	Sod	175,000	2.0
Dural hard fescue	<i>Festuca ovina 'duriscula'</i>	Cool	Bunch	565,000	1.0
Lincoln smooth brome	<i>Bromus inermis leysii 'Lincoln'</i>	Cool	Sod	130,000	3.0
Sodar streambank wheatgrass	<i>Agropyron riparium 'Sodas'</i>	Cool	Sod	170,000	2.5
Arriba western wheatgrass	<i>Agropyron smithii 'Arriba'</i>	Cool	Sod	110,000	7.0
<b>Total</b>					<b>15.5</b>
<b>High Water Table Soil Seed Mix</b>					
Meadow foxtail	<i>Alopecurus pratensis</i>	Cool	Sod	900,000	0.5
Reclap	<i>Agrostis alba</i>	Warm	Open sod	5,000,000	0.25
Reed canarygrass	<i>Phalaris arundinacea</i>	Cool	Sod	68,000	0.5
Lincoln smooth brome	<i>Bromus inermis leysii 'Lincoln'</i>	Cool	Sod	130,000	3.0
Pathfinder switchgrass	<i>Panicum virgatum 'Pathfinder'</i>	Warm	Sod	389,000	1.0
Alkar tall wheatgrass	<i>Agropyron elongatum 'Alkar'</i>	Cool	Bunch	79,000	5.5
<b>Total</b>					<b>10.75</b>
<b>Transition Turf Seed Mix</b>					
Ruebens Canadian bluegrass	<i>Poa compressa 'Ruebens'</i>	Cool	Sod	2,500,000	0.5
Dural hard fescue	<i>Festuca ovina 'duriscula'</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 leysii 'Lincoln'</i>	Cool	Sod	130,000	3.0
<b>Total</b>					<b>7.5</b>

**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	Growth Form	Seeds/Pound	Pounds of PLS/Acre
<b>Sandy Soil Seed Mix</b>					
Blue grama	<i>Bouteloua gracilis</i>	Warm	Sod-forming bunchgrass	825,000	0.5
Camper little bluestem	<i>Schizachyrium scoparium 'Camper'</i>	Warm	Bunch	240,000	1.0
Prairie sandreed	<i>Calamovilfa 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 'Vaughn'</i>	Warm	Sod	191,000	2.0
Arriba western wheatgrass	<i>Agropyron smithii 'Arriba'</i>	Cool	Sod	110,000	5.5
<b>Total</b>					<b>10.25</b>
<b>Heavy Clay, Rocky Foothill Seed Mix</b>					
Ephrium crested wheatgrass	<i>Agropyron cristatum 'Ephrium'</i>	Cool	Sod	175,000	1.5
Oahe Intermediate wheatgrass	<i>Agropyron intermedium 'Oahe'</i>	Cool	Sod	115,000	5.5
Vaughn sidecoats grama	<i>Bouteloua curtipendula 'Vaughn'</i>	Warm	Sod	191,000	2.0
Lincoln smooth brome	<i>Bromus inermis leysii 'Lincoln'</i>	Cool	Sod	130,000	3.0
Arriba western wheatgrass	<i>Agropyron smithii 'Arriba'</i>	Cool	Sod	110,000	5.5
<b>Total</b>					<b>17.5</b>

\* 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.

† See Table TS/PS-3 for seeding dates.

‡ If site is to be irrigated, the transition turf seed rates should be doubled.

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

¶ Can substitute 0.5 lbs PLS of blue grama for the 2.0 lbs PLS of Vaughn sidecoats grama.

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

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

Seeding Dates	Annual Grasses (Numbers in table reference species in Table TS/PS-1)		Perennial Grasses	
	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**

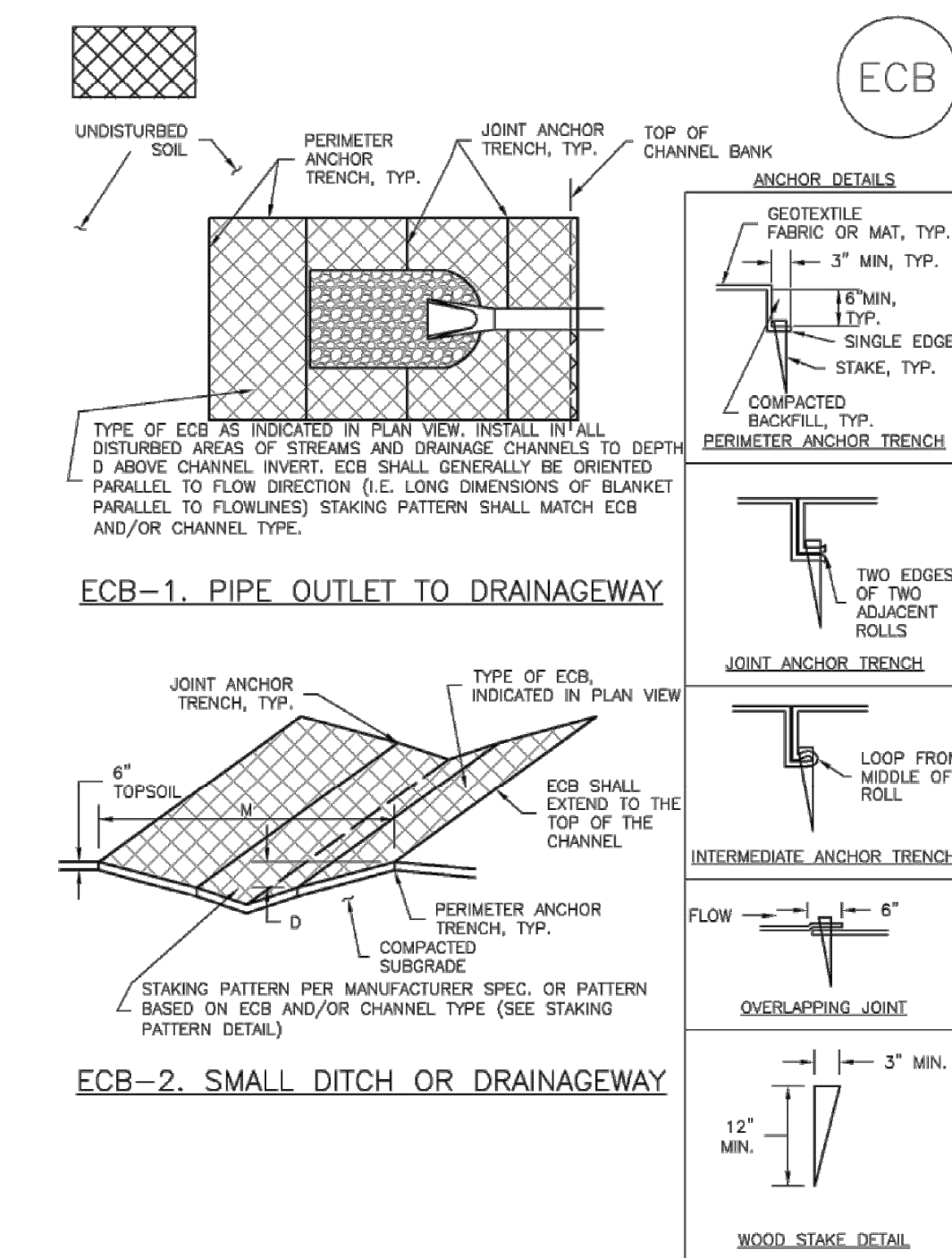
Monitor and observe seeded areas to identify areas of poor growth or areas that fail to germinate. Reseed and mulch these areas, as needed.

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.

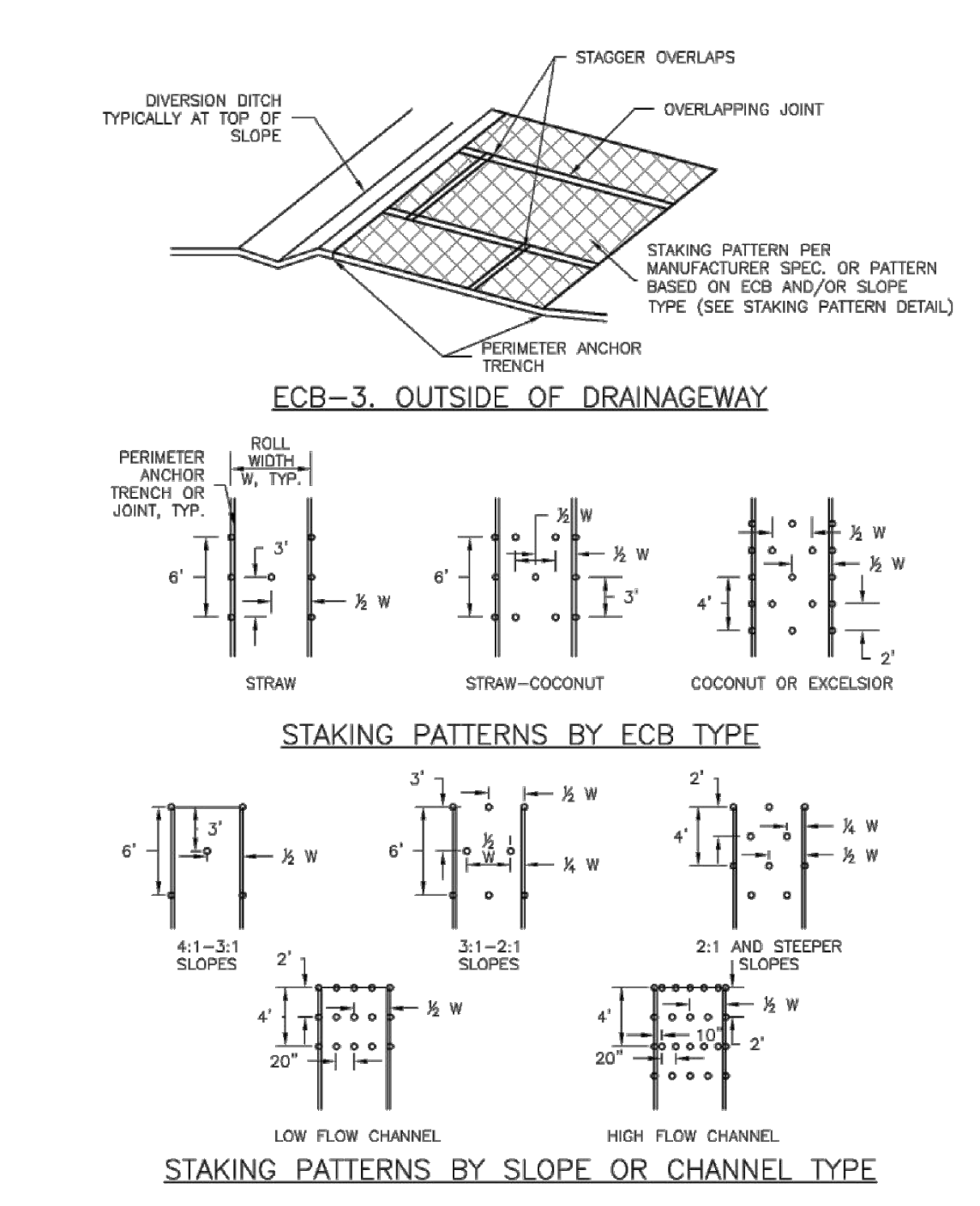
Seeded areas may require irrigation, particularly during extended dry periods. Targeted weed control may also be necessary.

Protect seeded areas from construction equipment and vehicle access.

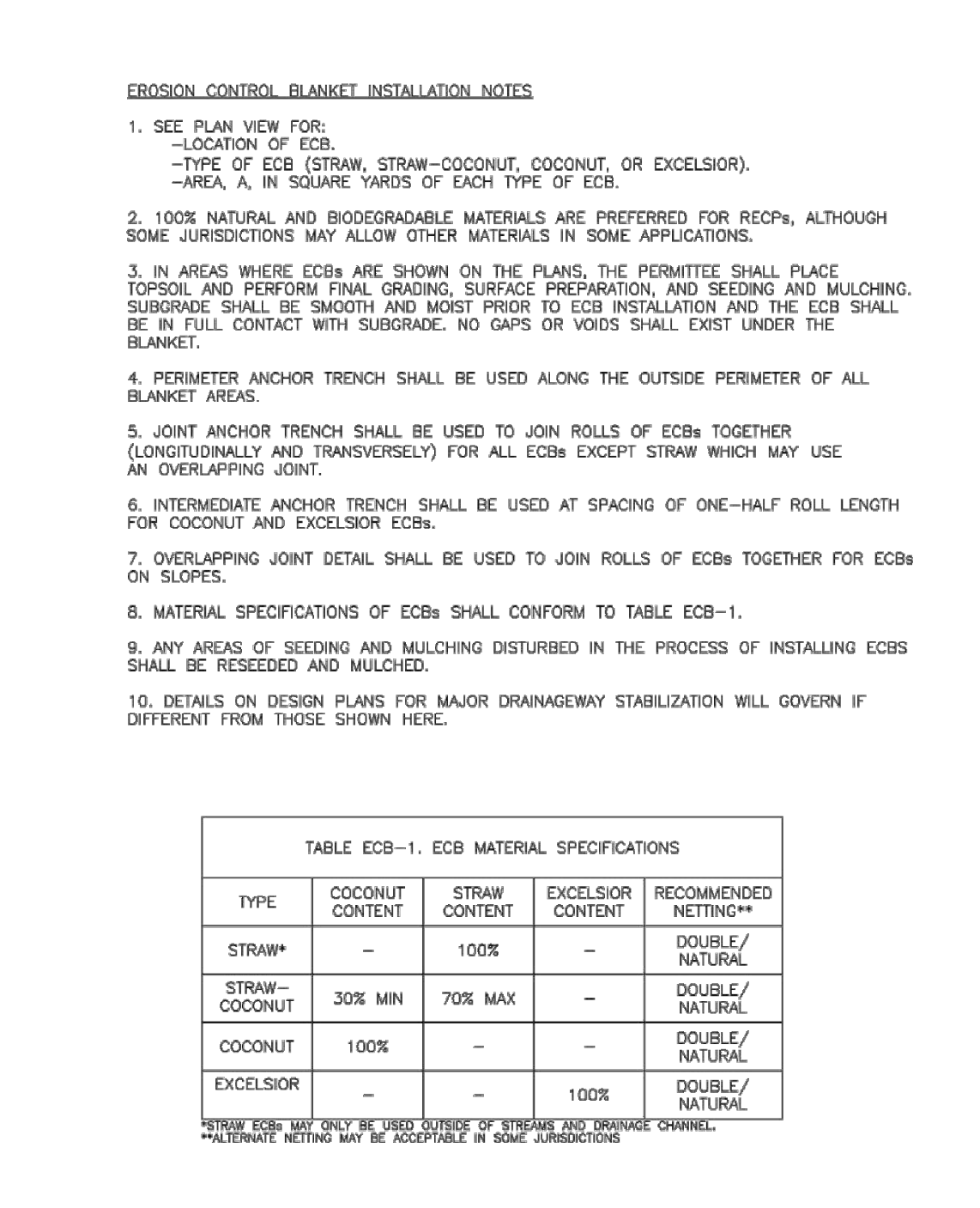
**EC-6 Rolled Erosion Control Products (RECP)**



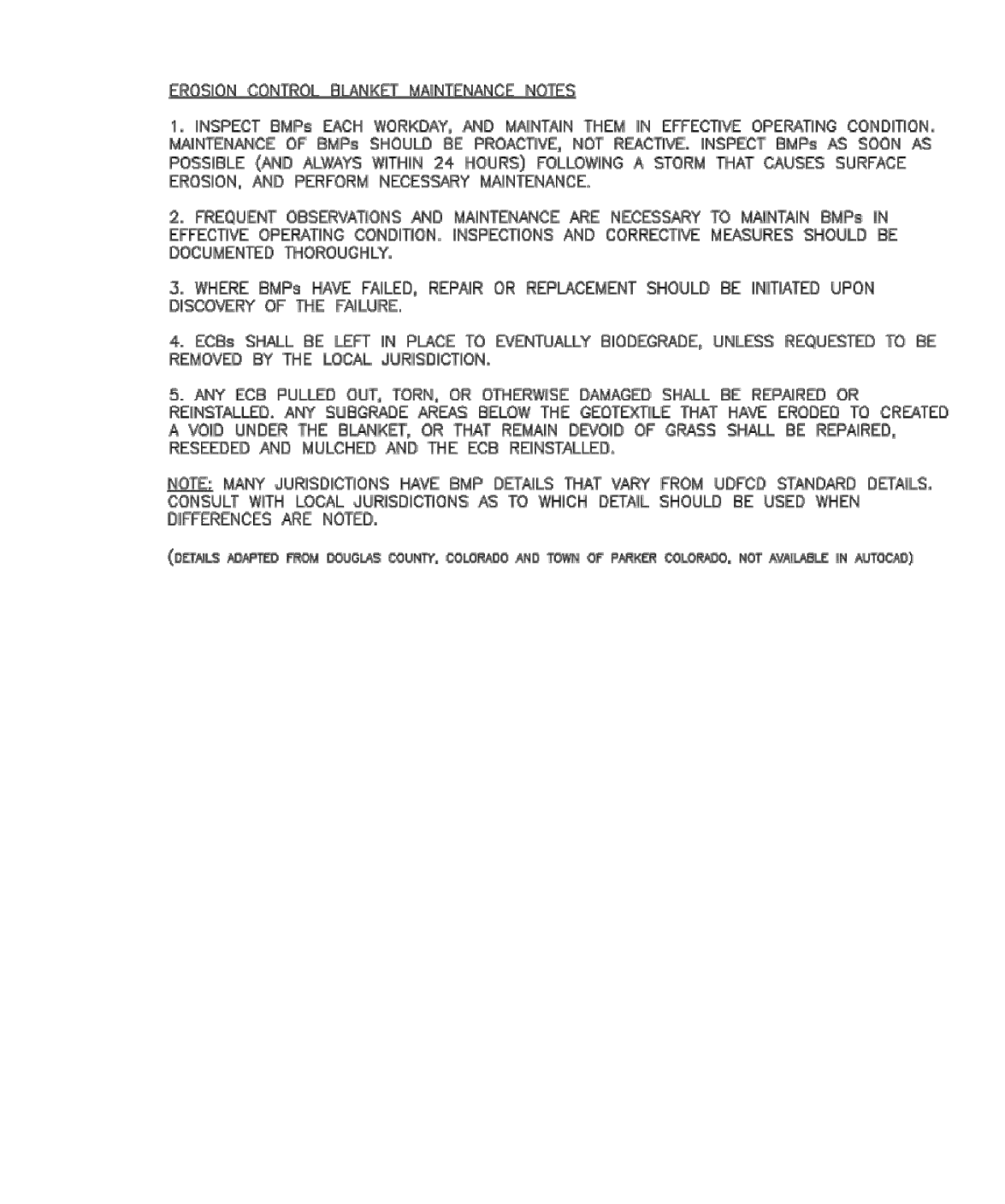
**EC-6 Rolled Erosion Control Products (RECP)**



**EC-6 Rolled Erosion Control Products (RECP)**



**EC-6 Rolled Erosion Control Products (RECP)**

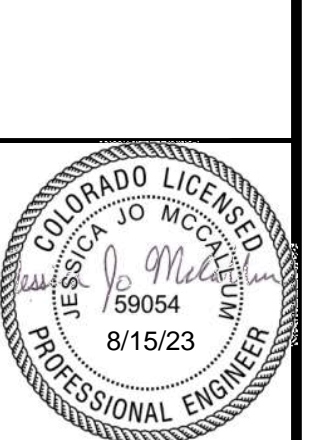


NO.	REVISION	DATE	APPROVED

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DESIGNED BY: JMM  
 DRAWN BY: JMM  
 CHECKED BY: JMM  
 DATE: 8/15/2023

WATERVIEW EAST COMMERCIAL  
 GRADING AND EROSION CONTROL PLANS  
 GEC DETAILS (3 OF 4)



PROJECT NO.  
 196195000  
 SHEET  
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**EC-6 Rolled Erosion Control Products (RECP)**

**Turf Reinforcement Mat (TRM):** A rolled erosion control product composed of non-degradable synthetic fibers, filaments, nets, wire mesh, and/or other elements, processed into a permanent, three-dimensional matrix of sufficient thickness. TRMs, which may be supplemented with degradable components, are designed to impart immediate erosion protection, enhance vegetation establishment and provide long-term functionality by permanently reinforcing vegetation during and after maturation. Note: TRMs are typically used in hydraulic applications, such as high flow ditches and channels, steep slopes, stream banks, and shorelines, where erosive forces may exceed the limits of natural, unreinforced vegetation or in areas where limited vegetation establishment is anticipated.

Tables RECP-1 and RECP-2 provide guidelines for selecting rolled erosion control products appropriate to site conditions and desired longevity. Table RECP-1 is for conditions where natural vegetation alone will provide permanent erosion control, whereas Table RECP-2 is for conditions where vegetation alone will not be adequately stable to provide long-term erosion protection due to flow or other conditions.

**EC-6 Rolled Erosion Control Products (RECP)**

**Table RECP-2. ECTC Standard Specification for Permanent<sup>1</sup> Rolled Erosion Control Products**  
(Adapted from: Erosion Control Technology Council 2005)

Product Type	Slope Applications	Channel Applications	
		Maximum Shear Stress <sup>4,5</sup>	Minimum Tensile Strength <sup>3</sup>
TRMs with a minimum thickness of 0.25 inches (6.35 mm) per ASTM D 6525 and UV stability of 80% per ASTM D 4355 (500 hours exposure).	0.5:1 (H:V)	6.0 lbs/ft <sup>2</sup> (288 Pa)	125 lbs/ft (1.82 kN/m)
	0.5:1 (H:V)	8.0 lbs/ft <sup>2</sup> (384 Pa)	150 lbs/ft (2.19 kN/m)
	0.5:1 (H:V)	10.0 lbs/ft <sup>2</sup> (480 Pa)	175 lbs/ft (2.55 kN/m)

<sup>1</sup> For TRMs containing degradable components, all property values must be obtained on the non-degradable portion of the matting alone.  
<sup>2</sup> Minimum Average Roll Values, machine direction only for tensile strength determination using ASTM D 6818 (Supersedes Mod. ASTM D 5035 for RECPs)  
<sup>3</sup> Field conditions with high loading and/or high survivability requirements may warrant the use of a TRM with a tensile strength of 44 kN/m (3,000 lb/ft) or greater.  
<sup>4</sup> Required minimum shear stress TRM (fully vegetated) can sustain without physical damage or excess erosion (> 12.7 mm (0.5 in.) soil loss) during a 30-minute flow event in large scale testing.  
<sup>5</sup> Acceptable large-scale testing protocols may include ASTM D 6460, or other independent testing deemed acceptable by the engineer.

**Design and Installation**

RECPs should be installed according to manufacturer's specifications and guidelines. Regardless of the type of product used, it is important to ensure no gaps or voids exist under the material and that all corners of the material are secured using stakes and trenching. Continuous contact between the product and the soil is necessary to avoid failure. Never use metal stakes to secure temporary erosion control products. Often wooden stakes are used to anchor RECPs; however, wood stakes may present installation and maintenance challenges and generally take a long time to biodegrade. Some local jurisdictions have had favorable experiences using biodegradable stakes.

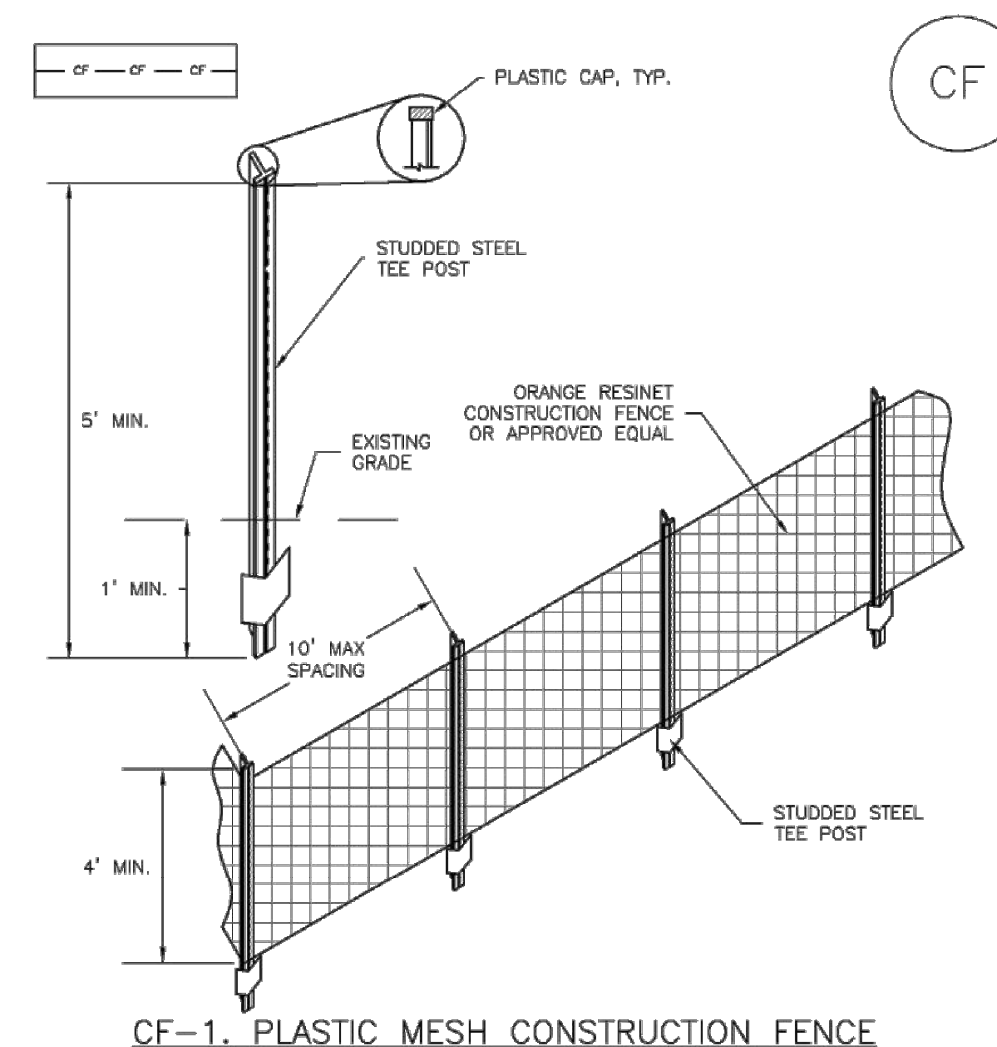
This BMP Fact Sheet provides design details for several commonly used ECB applications, including:

- ECB-1 Pipe Outlet to Drainageway
- ECB-2 Small Ditch or Drainageway
- ECB-3 Outside of Drainageway

RECP-2 Urban Drainage and Flood Control District  
Urban Storm Drainage Criteria Manual Volume 3 November 2010

RECP-4 Urban Drainage and Flood Control District  
Urban Storm Drainage Criteria Manual Volume 3 November 2010

**SM-3 Construction Fence (CF)**



**CF-1. PLASTIC MESH CONSTRUCTION FENCE**

**CONSTRUCTION FENCE INSTALLATION NOTES**

- SEE PLAN VIEW FOR: - LOCATION OF CONSTRUCTION FENCE.
- CONSTRUCTION FENCE SHOWN SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.
- CONSTRUCTION FENCE SHALL BE COMPOSED OF ORANGE, CONTRACTOR-GRADE MATERIAL THAT IS AT LEAST 4' HIGH. METAL POSTS SHOULD HAVE A PLASTIC CAP FOR SAFETY.
- STUDED STEEL TEE POSTS SHALL BE UTILIZED TO SUPPORT THE CONSTRUCTION FENCE. MAXIMUM SPACING FOR STEEL TEE POSTS SHALL BE 10'.
- CONSTRUCTION FENCE SHALL BE SECURELY FASTENED TO THE TOP, MIDDLE, AND BOTTOM OF EACH POST.

**Construction Fence (CF) SM-3**

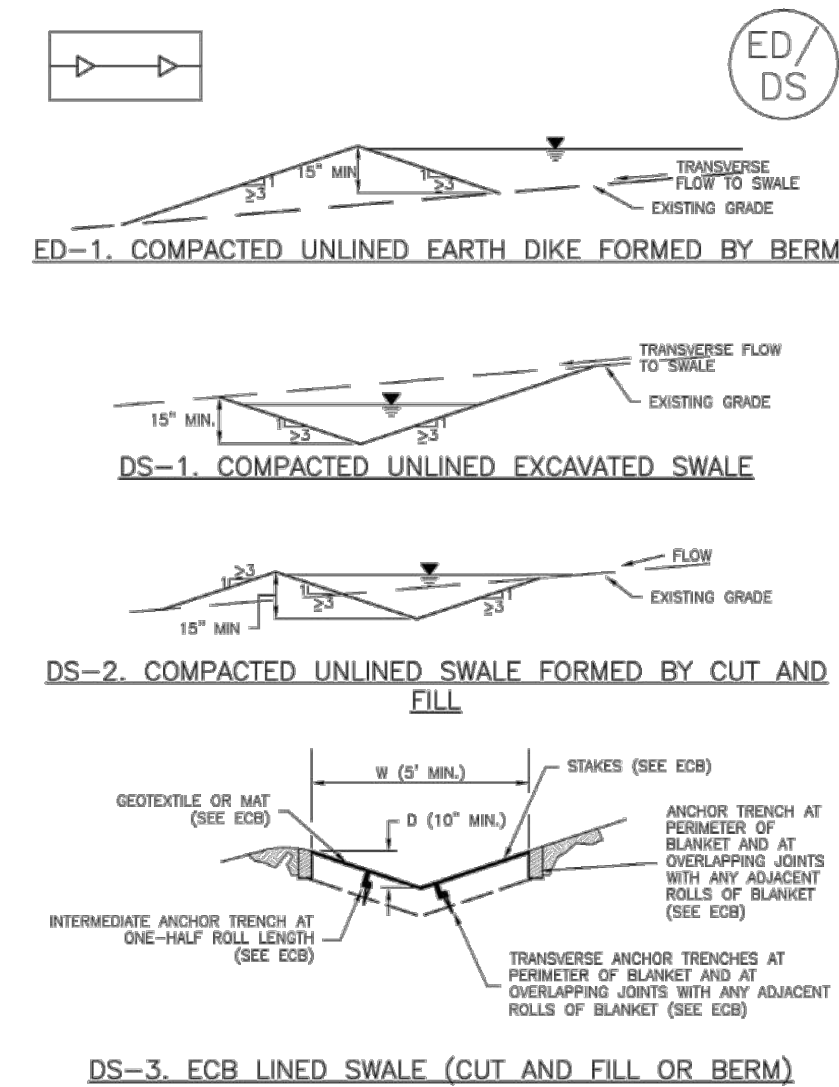
**CONSTRUCTION FENCE MAINTENANCE NOTES**

- 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.
  - FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
  - WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.
  - CONSTRUCTION FENCE SHALL BE REPAIRED OR REPLACED WHEN THERE ARE SIGNS OF DAMAGE SUCH AS RIPS OR SAGS. CONSTRUCTION FENCE IS TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION.
  - WHEN CONSTRUCTION FENCES ARE REMOVED, ALL DISTURBED AREAS ASSOCIATED WITH THE INSTALLATION, MAINTENANCE, AND/OR REMOVAL OF THE FENCE SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED, OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION.
- 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.
- (DETAIL ADAPTED FROM TOWN OF PARKER, COLORADO, NOT AVAILABLE IN AUTOCAD)

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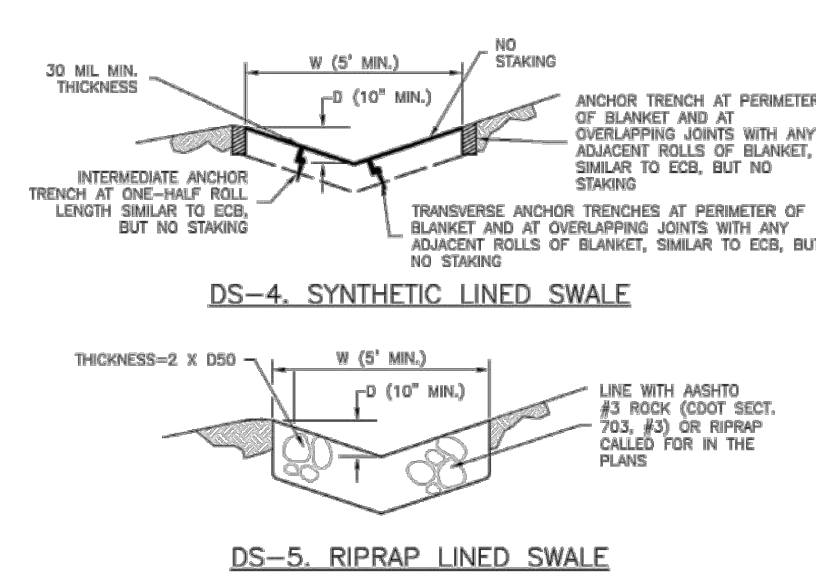
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**Earth Dikes and Drainage Swales (ED/DS) EC-10**



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**EC-10 Earth Dikes and Drainage Swales (ED/DS)**



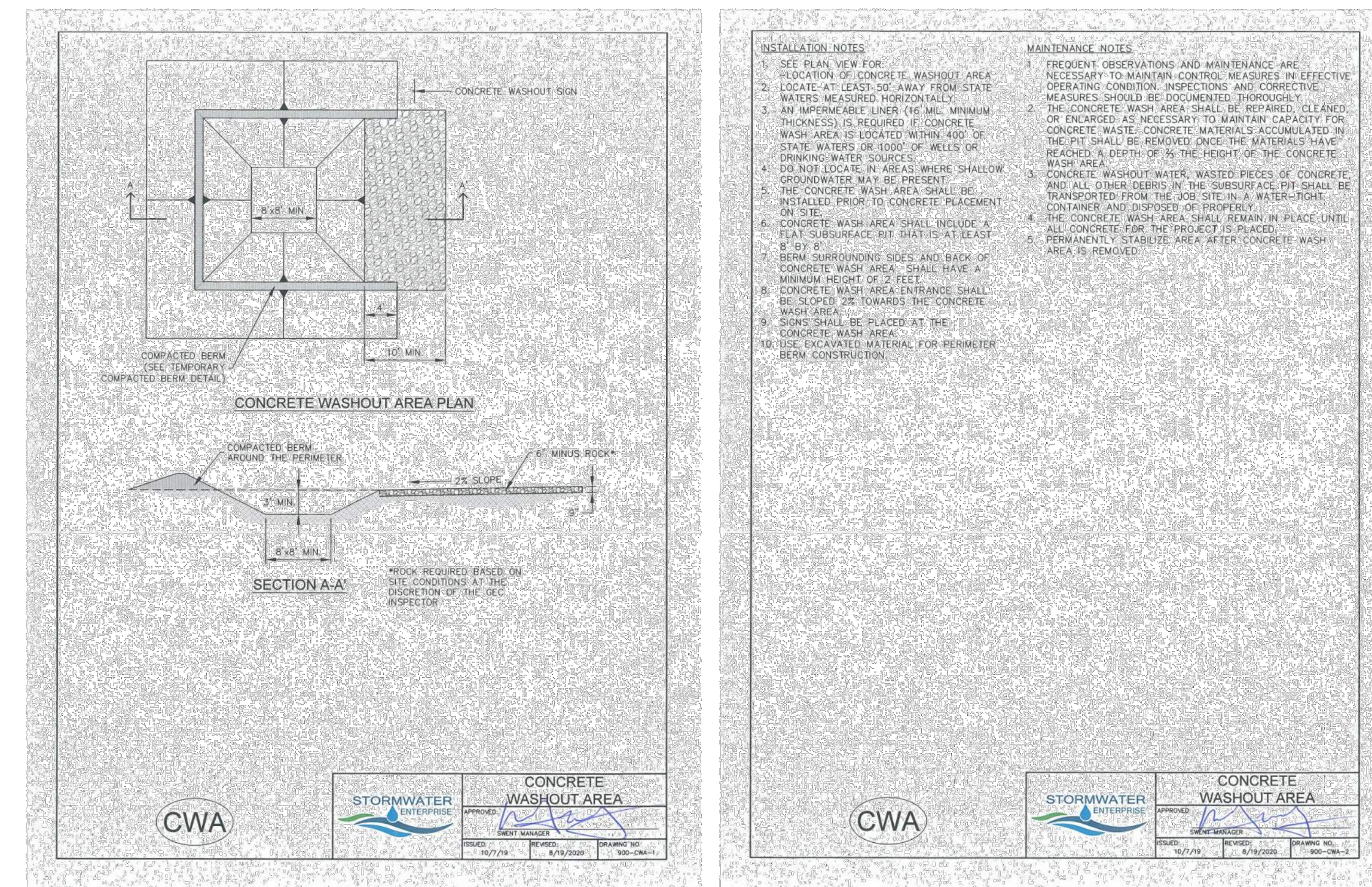
- EARTH DIKE AND DRAINAGE SWALE INSTALLATION NOTES**
- SEE SITE PLAN FOR: - LOCATION OF DIVERSION SWALE - TYPE OF SWALE (UNLINED, COMPACTED AND/OR LINED) - LENGTH OF EACH SWALE - DEPTH, D, AND WIDTH, W DIMENSIONS - FOR ECB/LINED SWALE, SEE EOB DETAIL - FOR RIPRAP LINED SWALE, SEE EOB DETAIL - FOR RIPRAP LINED SWALE, SEE EOB DETAIL
  - SEE DRAINAGE PLANS FOR DETAILS OF PERMANENT CONVEYANCE FACILITIES AND/OR DIVERSION SWALES EXCEEDING 24-HOUR FLOW RATE OR 10 CFS.
  - EARTH DIKES AND SWALES INDICATED ON SWAMP PLAN SHALL BE INSTALLED PRIOR TO LAND-DISTURBING ACTIVITIES IN PROGRESS.
  - EMBANKMENT IS TO BE COMPACTED TO SOLE OF MAXIMUM DENSITY AND WITHIN 2% OF OPTIMUM MOISTURE CONTENT ACCORDING TO ASTM D698.
  - SWALES ARE TO DRAIN TO A SEDIMENT CONTROL BMP.
  - FOR LINED DITCHES, INSTALLATION OF ECB/TRM SHALL CONFORM TO THE REQUIREMENTS OF THE EOB DETAIL.
  - WHEN CONSTRUCTION TRAFFIC MUST CROSS A DIVERSION SWALE, INSTALL A TEMPORARY CULVERT WITH A MINIMUM DIAMETER OF 12 INCHES.

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**Earth Dikes and Drainage Swales (ED/DS) EC-10**

- EARTH DIKE AND DRAINAGE SWALE MAINTENANCE NOTES**
- 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.
  - FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
  - WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.
  - SWALES SHALL REMAIN IN PLACE UNTIL THE END OF CONSTRUCTION IF APPROVED BY LOCAL JURISDICTION. SWALES MAY BE LEFT IN PLACE.
  - WHEN A SWALE IS REMOVED, THE DISTURBED AREA SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY LOCAL JURISDICTION.
- (DETAIL ADAPTED FROM DOUGLAS COUNTY, COLORADO AND THE CITY OF COLORADO SPRINGS, COLORADO, NOT AVAILABLE IN AUTOCAD)
- NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

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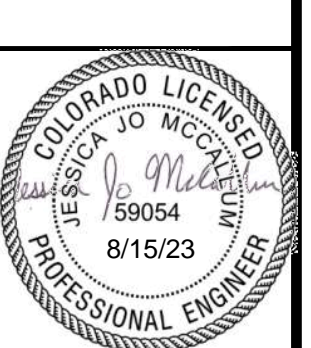
- INSTALLATION NOTES**
- SEE PLAN VIEW FOR: - LOCATION OF CONCRETE WASHOUT AREA - LOCATE AT LEAST 50' AWAY FROM STATE HIGHWAYS MEASURED HORIZONTALLY.
  - AN IMPERMEABLE LINER (6 MIL MINIMUM THICKNESS) IS REQUIRED IF CONCRETE WASH AREA IS LOCATED WITHIN 400' OF STAIN WATERS OR 1000' OF WELLS OR DRINKING WATER SOURCES.
  - DO NOT LOCATE IN AREAS WHERE SHALLOW GROUNDWATER MAY BE PRESENT.
  - THE CONCRETE WASH AREA SHALL BE INSTALLED PRIOR TO CONCRETE PLACEMENT ON SITE.
  - CONCRETE WASH AREA SHALL INCLUDE A FLAT SUBGRADE FOR MATS AT LEAST 4" BY 8".
  - BERM SURROUNDING SWALES AND BACK OF CONCRETE WASH AREA SHALL HAVE A MINIMUM HEIGHT OF 2 FEET.
  - CONCRETE WASH AREA ENTRANCE SHALL BE SLOPED 2% TOWARDS THE CONCRETE WASH AREA. SHALL BE PLACED AT THE CONCRETE WASH AREA.
  - USE CALCULATED MATERIAL FOR PERIMETER BERM CONSTRUCTION.
- MAINTENANCE NOTES**
- FREQUENT OBSERVATION AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONSTRUCTION MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
  - THE CONCRETE WASH AREA SHALL BE REPAIRED, CLEANED, OR ENLARGED AS NECESSARY TO MAINTAIN CAPACITY FOR CONCRETE WASTE. CONCRETE MATERIALS ACCUMULATED IN THE PIT SHALL BE REMOVED, ONCE THE MATERIALS HAVE REACHED A DEPTH OF 9" THE HEIGHT OF THE CONCRETE WASH AREA.
  - CONCRETE WASHOUT WASTE, WASTED PIECES OF CONCRETE AND ALL OTHER DEBRIS IN THE SURFACE PIT SHALL BE TRANSPORTED FROM THE JOB SITE IN A WATER-TIGHT CONTAINER AND DISPOSED OF PROPERLY.
  - THE CONCRETE WASH AREA SHALL REMAIN IN PLACE UNTIL ALL CONCRETE FROM THE PROJECT IS PLACED.
  - PERMANENTLY STABILIZE AREA AFTER CONCRETE WASH AREA IS REMOVED.

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DRAWN BY: JJM  
CHECKED BY: JJM  
DATE: 8/15/2023

WATERVIEW EAST COMMERCIAL  
GRADING AND EROSION CONTROL PLANS  
GEC DETAILS (4 OF 4)



PROJECT NO.  
196195000  
SHEET  
C 3.7