

2023 Financial Assurance Estimate Form
(with pre-plat construction)

Updated: 12/8/2022

PROJECT INFORMATION		
Paint Brush Hills Pumphouse 6 Site Development Plan	7/6/2023	PPR-2318
Project Name	Date	PCD File No.

Description	Quantity	Units	Unit Cost	Total	(with Pre-Plat Construction)	
					% Complete	Remaining
SECTION 1 - GRADING AND EROSION CONTROL (Construction and Permanent BMPs)						
Earthwork						
less than 1,000; \$5,300 min	75	CY	\$ 8.00	= \$ 5,300.00		\$ 5,300.00
1,000-5,000; \$8,000 min		CY	\$ 6.00	= \$ -		\$ -
5,001-20,000; \$30,000 min		CY	\$ 5.00	= \$ -		\$ -
20,001-50,000; \$100,000 min		CY	\$ 3.50	= \$ -		\$ -
50,001-200,000; \$175,000 min		CY	\$ 2.50	= \$ -		\$ -
greater than 200,000; \$500,000 min		CY	\$ 2.00	= \$ -		\$ -
Permanent Erosion Control Blanket	237.0	SY	\$ 8.00	= \$ 1,896.00		\$ 1,896.00
Permanent Seeding (inc. noxious weed mgmnt.) & Mulching	0.5	AC	\$ 1,875.00	= \$ 899.49		\$ 899.49
Permanent Pond/BMP (provide engineer's estimate)		EA		= \$ -		\$ -
Concrete Washout Basin CWA shown on GEC Plans		EA	\$ 1,089.00	= \$ -		\$ -
Inlet Protection	2	EA	\$ 202.00	= \$ 404.00		\$ 404.00
Rock Check Dam		EA	\$ 605.00	= \$ -		\$ -
Safety Fence		LF	\$ 3.00	= \$ -		\$ -
Sediment Basin		EA	\$ 2,132.00	= \$ -		\$ -
Sediment Trap		EA	\$ 500.00	= \$ -		\$ -
Silt Fence	327	LF	\$ 3.00	= \$ 981.00		\$ 981.00
Slope Drain		LF	\$ 40.00	= \$ -		\$ -
Straw Bale		EA	\$ 31.00	= \$ -		\$ -
Straw Wattle/Rock Sock	0	LF	\$ 7.00	= \$ -		\$ -
Surface Roughening		AC	\$ 250.00	= \$ -		\$ -
Temporary Erosion Control Blanket		SY	\$ 3.00	= \$ -		\$ -
Temporary Seeding and Mulching		AC	\$ 1,666.00	= \$ -		\$ -
Vehicle Tracking Control	1	EA	\$ 2,867.00	= \$ 2,867.00		\$ 2,867.00
[insert items not listed but part of construction plans]				= \$ -		\$ -
MAINTENANCE (35% of Construction BMPs)				= \$ 1,488.20		\$ 1,488.20
Section 1 Subtotal				= \$ 13,835.69		\$ 13,835.69

* - Subject to defect warranty financial assurance. A minimum of 20% shall be retained until final acceptance (MAXIMUM OF 80% COMPLETE ALLOWED)

SECTION 2 - PUBLIC IMPROVEMENTS *

ROADWAY IMPROVEMENTS						
Construction Traffic Control		LS		= \$ -		\$ -
Aggregate Base Course (135 lbs/cf)		Tons	\$ 34.00	= \$ -		\$ -
Aggregate Base Course (135 lbs/cf)		CY	\$ 61.00	= \$ -		\$ -
Asphalt Pavement (3" thick)		SY	\$ 17.00	= \$ -		\$ -
Asphalt Pavement (4" thick)		SY	\$ 23.00	= \$ -		\$ -
Asphalt Pavement (6" thick)		SY	\$ 35.00	= \$ -		\$ -
Asphalt Pavement (147 lbs/cf) _" thick		Tons	\$ 106.00	= \$ -		\$ -
Raised Median, Paved		SF	\$ 10.00	= \$ -		\$ -
Regulatory Sign/Advisory Sign		EA	\$ 364.00	= \$ -		\$ -
Guide/Street Name Sign		EA		= \$ -		\$ -
Epoxy Pavement Marking		SF	\$ 16.00	= \$ -		\$ -
Thermoplastic Pavement Marking		SF	\$ 28.00	= \$ -		\$ -
Barricade - Type 3		EA	\$ 241.00	= \$ -		\$ -
Delineator - Type I		EA	\$ 29.00	= \$ -		\$ -
Curb and Gutter, Type A (6" Vertical)		LF	\$ 35.00	= \$ -		\$ -
Curb and Gutter, Type B (Median)		LF	\$ 35.00	= \$ -		\$ -
Curb and Gutter, Type C (Ramp)		LF	\$ 35.00	= \$ -		\$ -
4" Sidewalk (common areas only)		SY	\$ 58.00	= \$ -		\$ -
5" Sidewalk		SY	\$ 72.00	= \$ -		\$ -
6" Sidewalk		SY	\$ 87.00	= \$ -		\$ -
8" Sidewalk		SY	\$ 116.00	= \$ -		\$ -
Pedestrian Ramp		EA	\$ 1,390.00	= \$ -		\$ -
Cross Pan, local (8" thick, 6' wide to include return)		LF	\$ 73.00	= \$ -		\$ -
Cross Pan, collector (9" thick, 8' wide to include return)		LF	\$ 111.00	= \$ -		\$ -
Curb Opening with Drainage Chase		EA	\$ 1,790.00	= \$ -		\$ -
Guardrail Type 3 (W-Beam)		LF	\$ 60.00	= \$ -		\$ -
Guardrail Type 7 (Concrete)		LF	\$ 87.00	= \$ -		\$ -
Guardrail End Anchorage		EA	\$ 2,538.00	= \$ -		\$ -
Guardrail Impact Attenuator		EA	\$ 4,556.00	= \$ -		\$ -
Sound Barrier Fence (CMU block, 6' high)		LF	\$ 95.00	= \$ -		\$ -
Sound Barrier Fence (panels, 6' high)		LF	\$ 97.00	= \$ -		\$ -
Electrical Conduit, Size =		LF	\$ 20.00	= \$ -		\$ -
Traffic Signal, (provide engineer's estimate)		EA		= \$ -		\$ -

PROJECT INFORMATION

Paint Brush Hills Pumhouse 6 Site Development Plan

7/6/2023

PPR-2318

Project Name

Date

PCD File No.

Description	Quantity	Units	Unit Cost		Total	(with Pre-Plat Construction)	
						% Complete	Remaining
				=	\$ -		\$ -
<i>[insert items not listed but part of construction plans]</i>				=	\$ -		\$ -
STORM DRAIN IMPROVEMENTS							
Concrete Box Culvert (M Standard), Size (W x H)		LF		=	\$ -		\$ -
18" Reinforced Concrete Pipe		LF	\$ 76.00	=	\$ -		\$ -
24" Reinforced Concrete Pipe		LF	\$ 91.00	=	\$ -		\$ -
30" Reinforced Concrete Pipe		LF	\$ 114.00	=	\$ -		\$ -
36" Reinforced Concrete Pipe		LF	\$ 140.00	=	\$ -		\$ -
42" Reinforced Concrete Pipe		LF	\$ 187.00	=	\$ -		\$ -
48" Reinforced Concrete Pipe		LF	\$ 228.00	=	\$ -		\$ -
54" Reinforced Concrete Pipe		LF	\$ 297.00	=	\$ -		\$ -
60" Reinforced Concrete Pipe		LF	\$ 348.00	=	\$ -		\$ -
66" Reinforced Concrete Pipe		LF	\$ 402.00	=	\$ -		\$ -
72" Reinforced Concrete Pipe		LF	\$ 460.00	=	\$ -		\$ -
18" Corrugated Steel Pipe		LF	\$ 98.00	=	\$ -		\$ -
24" Corrugated Steel Pipe		LF	\$ 112.00	=	\$ -		\$ -
30" Corrugated Steel Pipe		LF	\$ 143.00	=	\$ -		\$ -
36" Corrugated Steel Pipe		LF	\$ 171.00	=	\$ -		\$ -
42" Corrugated Steel Pipe		LF	\$ 197.00	=	\$ -		\$ -
48" Corrugated Steel Pipe		LF	\$ 207.00	=	\$ -		\$ -
54" Corrugated Steel Pipe		LF	\$ 304.00	=	\$ -		\$ -
60" Corrugated Steel Pipe		LF	\$ 328.00	=	\$ -		\$ -
66" Corrugated Steel Pipe		LF	\$ 397.00	=	\$ -		\$ -
72" Corrugated Steel Pipe		LF	\$ 467.00	=	\$ -		\$ -
78" Corrugated Steel Pipe		LF	\$ 537.00	=	\$ -		\$ -
84" Corrugated Steel Pipe		LF	\$ 642.00	=	\$ -		\$ -
Flared End Section (FES) RCP Size = <small>(unit cost = 6x pipe unit cost)</small>		EA		=	\$ -		\$ -
Flared End Section (FES) CSP Size = <small>(unit cost = 6x pipe unit cost)</small>		EA		=	\$ -		\$ -
End Treatment- Headwall		EA		=	\$ -		\$ -
End Treatment- Wingwall		EA		=	\$ -		\$ -
End Treatment - Cutoff Wall		EA		=	\$ -		\$ -
Curb Inlet (Type R) L=5', Depth < 5'		EA	\$ 6,703.00	=	\$ -		\$ -
Curb Inlet (Type R) L=5', 5' ≤ Depth < 10'		EA	\$ 8,715.00	=	\$ -		\$ -
Curb Inlet (Type R) L =5', 10' ≤ Depth < 15'		EA	\$ 10,092.00	=	\$ -		\$ -
Curb Inlet (Type R) L =10', Depth < 5'		EA	\$ 9,224.00	=	\$ -		\$ -
Curb Inlet (Type R) L =10', 5' ≤ Depth < 10'		EA	\$ 9,507.00	=	\$ -		\$ -
Curb Inlet (Type R) L =10', 10' ≤ Depth < 15'		EA	\$ 11,901.00	=	\$ -		\$ -
Curb Inlet (Type R) L =15', Depth < 5'		EA	\$ 11,995.00	=	\$ -		\$ -
Curb Inlet (Type R) L =15', 5' ≤ Depth < 10'		EA	\$ 12,858.00	=	\$ -		\$ -
Curb Inlet (Type R) L =15', 10' ≤ Depth < 15'		EA	\$ 14,061.00	=	\$ -		\$ -
Curb Inlet (Type R) L =20', Depth < 5'		EA	\$ 12,783.00	=	\$ -		\$ -
Curb Inlet (Type R) L =20', 5' ≤ Depth < 10'		EA	\$ 14,109.00	=	\$ -		\$ -
Grated Inlet (Type C), Depth < 5'		EA	\$ 5,611.00	=	\$ -		\$ -
Grated Inlet (Type D), Depth < 5'		EA	\$ 6,931.00	=	\$ -		\$ -
Storm Sewer Manhole, Box Base		EA	\$ 14,061.00	=	\$ -		\$ -
Storm Sewer Manhole, Slab Base		EA	\$ 7,734.00	=	\$ -		\$ -
Geotextile (Erosion Control)		SY	\$ 8.00	=	\$ -		\$ -
Rip Rap, d50 size from 6" to 24"		Tons	\$ 97.00	=	\$ -		\$ -
Rip Rap, Grouted		Tons	\$ 115.00	=	\$ -		\$ -
Drainage Channel Construction, Size (W x H)		LF	\$ -	=	\$ -		\$ -
Drainage Channel Lining, Concrete		CY	\$ 689.00	=	\$ -		\$ -
Drainage Channel Lining, Rip Rap		CY	\$ 135.00	=	\$ -		\$ -
Drainage Channel Lining, Grass		AC	\$ 1,776.00	=	\$ -		\$ -
Drainage Channel Lining, Other Stabilization				=	\$ -		\$ -
				=	\$ -		\$ -
<i>[insert items not listed but part of construction plans]</i>				=	\$ -		\$ -
<small>* - Subject to defect warranty financial assurance. A minimum of 20% shall be retained until final acceptance (MAXIMUM OF 80% COMPLETE ALLOWED)</small>							
Section 2 Subtotal				=	\$ -		\$ -

PROJECT INFORMATION

Paint Brush Hills Pumhouse 6 Site Development Plan

7/6/2023

PPR-2318

Project Name

Date

PCD File No.

Description	Quantity	Units	Unit Cost		Total	(with Pre-Plat Construction)		
						% Complete	Remaining	
SECTION 3 - COMMON DEVELOPMENT IMPROVEMENTS (Private or District and NOT Maintained by EPC)**								
ROADWAY IMPROVEMENTS								
				=	\$ -		\$ -	
				=	\$ -		\$ -	
				=	\$ -		\$ -	
				=	\$ -		\$ -	
				=	\$ -		\$ -	
				=	\$ -		\$ -	
STORM DRAIN IMPROVEMENTS (Exception: Permanent Pond/BMP shall be itemized under Section 1)								
				=	\$ -		\$ -	
				=	\$ -		\$ -	
				=	\$ -		\$ -	
				=	\$ -		\$ -	
				=	\$ -		\$ -	
				=	\$ -		\$ -	
WATER SYSTEM IMPROVEMENTS								
Water Main Pipe (PVC), Size 8"		LF	\$ 78.00	=	\$ -		\$ -	
Water Main Pipe (Ductile Iron), Size 8"		LF	\$ 91.00	=	\$ -		\$ -	
Gate Valves, 8"		EA	\$ 2,247.00	=	\$ -		\$ -	
Fire Hydrant Assembly, w/ all valves		EA	\$ 7,978.00	=	\$ -		\$ -	
Water Service Line Installation, inc. tap and valves		EA	\$ 1,601.00	=	\$ -		\$ -	
Fire Cistern Installation, complete		EA		=	\$ -		\$ -	
<i>[insert items not listed but part of construction plans]</i>				=	\$ -		\$ -	
SANITARY SEWER IMPROVEMENTS								
Sewer Main Pipe (PVC), Size 8"		LF	\$ 78.00	=	\$ -		\$ -	
Sanitary Sewer Manhole, Depth < 15 feet		EA	\$ 5,305.00	=	\$ -		\$ -	
Sanitary Service Line Installation, complete		EA	\$ 1,696.00	=	\$ -		\$ -	
Sanitary Sewer Lift Station, complete		EA		=	\$ -		\$ -	
<i>[insert items not listed but part of construction plans]</i>				=	\$ -		\$ -	
LANDSCAPING IMPROVEMENTS (For subdivision specific condition of approval, or PUD)								
Trees/Shrubs	20	EA	\$ 250.00	=	\$ 5,000.00		\$ 5,000.00	
Mulching	0.05	AC	\$ 831.00	=	\$ 38.57		\$ 38.57	
		EA		=	\$ -		\$ -	
		EA		=	\$ -		\$ -	
		EA		=	\$ -		\$ -	
Section 3 Subtotal					=	\$ 5,038.57		\$ 5,038.57

** - Section 3 is not subject to defect warranty requirements

PROJECT INFORMATION

Paint Brush Hills Pumphouse 6 Site Development Plan
Project Name

7/6/2023
Date

PPR-2318
PCD File No.

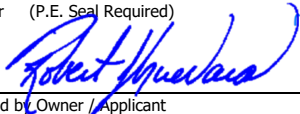
Description	Quantity	Units	Unit Cost	Total	(with Pre-Plat Construction)	
					% Complete	Remaining
AS-BUILT PLANS (Public Improvements inc. Permanent WQCV BMPs)		LS		= \$ -		\$ -
POND/BMP CERTIFICATION (inc. elevations and volume calculations)		LS		= \$ -		\$ -
Total Construction Financial Assurance					\$	18,874.27
(Sum of all section subtotals plus as-builts and pond/BMP certification)						
Total Remaining Construction Financial Assurance (with Pre-Plat Construction)					\$	18,874.27
(Sum of all section totals less credit for items complete plus as-builts and pond/BMP certification)						
Total Defect Warranty Financial Assurance					\$	1,619.10
(20% of all items identified as (*). To be collateralized at time of preliminary acceptance)						

Approvals

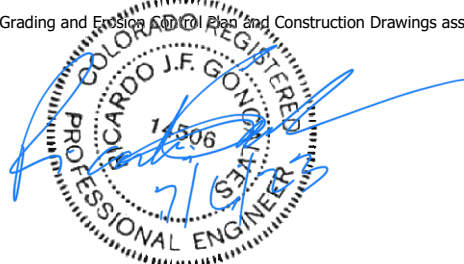
I hereby certify that this is an accurate and complete estimate of costs for the work as shown on the Grading and Erosion Control Plan and Construction Drawings associated with the Project.



Engineer (P.E. Seal Required)



Approved by Owner / Applicant



Date

Approved by El Paso County Engineer / ECM Administrator

Date



3275 Akers Drive
 Colorado Springs, CO 80922
 Phone 719-520-6460
 Fax 719-520-6879
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**EPC STORMWATER REVIEW COMMENTS
 IN ORANGE BOXES WITH BLACK TEXT**

Y - Satisfies criteria
N - Needs to be addressed

EL PASO COUNTY GRADING AND EROSION CONTROL PLAN CHECKLIST

EPC Project Number: PPR2318

Revised: October 2021

		Applicant	EPC
1. GRADING AND EROSION CONTROL PLAN (complete form using Y, N, N/A in the "Applicant" column)			
a	Vicinity map	Y	Y
b	Adjacent city/town/jurisdictional boundaries, subdivision names, and property parcel numbers labeled	Y	Y
c	North arrow and acceptable scale (1"=20' to 1"=100')	Y	Y
d	Legend for all symbols used in the plan	Y	Y
e	Existing and proposed property lines. Proposed subdivision boundary for subdivision projects	Y	Y
f	All existing structures	Y	Y
g	All existing utilities	Y	Y
h	Construction site boundaries	Y	Y
i	Existing vegetation (notes are acceptable in cases where there is no notable vegetation, only grasses/weeds, or site has already been stripped)	Y	Y
j	FEMA 100-yr floodplain	Y	Y
k	Existing and proposed water courses including springs, streams, wetlands, detention ponds, stormwater quality structures, roadside ditches, irrigation ditches and other water surfaces. Show maintenance of pre-existing vegetation within 50 feet of a receiving water	Y	Y
l	Existing and proposed contours 2 feet or less (except for hillside)	Y	Y
m	Limits of disturbance delineating all anticipated areas of soil disturbance	Y	Y
n	Identify and protect areas outside of the construction site boundary with existing fencing, construction fencing or other methods as appropriate	Y	Y
o	Off-site grading clearly shown and called out	N/A	N/A
p	Areas of cut and fill identified	Y	Y
q	Conclusions from soils/geotechnical report and geologic hazards report incorporated in grading design (slopes, embankments, materials, mitigation, etc.)	Y	Y
r	Proposed slopes steeper than 3:1 with top and toe of slope delineated. Erosion control blanketing or other protective covering required	Y	Y
s	Stormwater flow direction arrows	Y	Y
t	Location of any dedicated asphalt / concrete batch plants	N/A	N/A
u	Areas used for staging, storage of building materials, soils (stockpiles) or wastes. The use of construction office trailers requires PCD permitting	Y	Y
v	All proposed temporary construction control measures, structural and non-structural. Temporary construction control measures shall be identified by phase of implementation to include "initial," "interim," and "final" or shown on separate phased maps identifying each phase	Y	Y
w	Vehicle tracking provided at all construction entrances/exits. Construction fencing, barricades, and/or signage provided at access points not to be used for construction	Y	Y
x	Temporary sediment ponds provided for disturbed drainage areas greater than 1 acre	N/A	N/A



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EL PASO COUNTY GRADING AND EROSION CONTROL PLAN CHECKLIST

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		Applicant	EPC
y	Dewatering operations to include locations of diversion, pump and discharge(s) as anticipated at time of design	N/A	N/A
z	All proposed temporary construction control measure details. Custom or other jurisdiction's details used must meet or exceed EPC standards	Y	Y
aa	Any off-site stormwater control measure proposed for use by the project and not under the direct control or ownership of the Owner or Operator	Y	Y
bb	Existing and proposed permanent storm water management facilities, including areas proposed for stormwater infiltration or subsurface detention	Y	Y
cc	Existing and proposed easements (permanent and construction) including required off-site easements	N/A	N/A
dd	Retaining walls shall not to be located in County ROW unless approved via license agreement. A building permit from Regional Building Department is required for walls greater than or equal to 4 feet in height, series of walls, or walls supporting a surcharge and must be design by P.E.	N/A	N/A
ee	Plan certified by a Colorado Registered P.E., with EPC standard signature blocks for Engineer, Owner and EPC	Y	N
ff	<p>Engineer's Statement (for standalone GEC Plan): 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 any negligent acts, errors or omissions on my part in preparing this plan.</p> <p>_____ Date</p> <p>Engineer of Record Signature</p>	Y	Y
gg	<p>Engineer's Statement (for GEC Plan within Construction Drawing set): These detailed plans and specifications were prepared under my direction and supervision. Said plans and specifications have been prepared according to the criteria established by the County for detailed roadway, drainage, grading and erosion control plans and specifications, and said plans and specifications are in conformity with applicable master drainage plans and master transportation plans. Said plans and specifications meet the purposes for which the particular roadway and drainage facilities are designed and are correct to the best of my knowledge and belief. I accept responsibility for any liability caused by any negligent acts, errors or omissions on my part in preparation of these detailed plans and specifications.</p> <p>_____ Date</p> <p>Engineer of Record Signature</p>	N/A	N/A
hh	<p>Owner's Statement (for standalone GEC Plan): I, the owner/developer have read and will comply with the requirements of the Grading and Erosion Control Plan.</p> <p>_____ Date</p> <p>Owner Signature</p>	Y	Y
ii	<p>Owner's Statement (for GEC Plan within Construction Drawing set): I, the owner/developer have read and will comply with the requirements of the grading and erosion control plan and all of the requirements specified in these detailed plans and specifications.</p> <p>_____ Date</p> <p>Owner Signature</p>	N/A	N/A



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EL PASO COUNTY GRADING AND EROSION CONTROL PLAN CHECKLIST

Unresolved from Submittal 1: GEC
 Plans need to have all standard
 notes for EPC GEC Plans.

EPC Project Number: PPR2318

Revised: October 2021

		Applicant	EPC
3. STANDARD NOTES FOR EL PASO COUNTY GRADING AND EROSION CONTROL PLANS			
1	Stormwater discharges from construction sites shall not cause or threaten to cause pollution, contamination, or degradation of State Waters. All work and earth disturbance shall be done in a manner that minimizes pollution of any on-site or off-site waters, including wetlands.	Y	
2	Notwithstanding anything depicted in these plans in words or graphic representation, all design and construction related to roads, storm drainage and erosion control shall conform to the standards and requirements of the most recent version of the relevant adopted El Paso County standards, including the Land Development Code, the Engineering Criteria Manual, the Drainage Criteria Manual, and the Drainage Criteria Manual Volume 2. Any deviations from regulations and standards must be requested, and approved, in writing.	Y	
3	A separate Stormwater Management Plan (SMWP) for this project shall be completed and an Erosion and Stormwater Quality Control Permit (ESQCP) issued prior to commencing construction. Management of the SWMP during construction is the responsibility of the designated Qualified Stormwater Manager or Certified Erosion Control Inspector. The SWMP shall be located on-site at all times during construction and shall be kept up to date with work progress and changes in the field.	Y	
4	Once the ESQCP is approved and a "Notice to Proceed" has been issued, the contractor may install the initial stage erosion and sediment control measures as indicated on the approved 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 staff.	Y	
5	Control measures must be installed prior to commencement of activities that could contribute pollutants to stormwater. Control measures for all slopes, channels, ditches, and disturbed land areas shall be installed immediately upon completion of the disturbance.	Y	
6	All temporary sediment and erosion control measures shall be maintained and remain in effective operating condition until permanent soil erosion control measures are implemented and final stabilization is established. All persons engaged in land disturbance activities shall assess the adequacy of control measures at the site and identify if changes to those control measures are needed to ensure the continued effective performance of the control measures. All changes to temporary sediment and erosion control measures must be incorporated into the Stormwater Management Plan.	Y	
7	Temporary stabilization shall be implemented on disturbed areas and stockpiles where ground disturbing construction activity has permanently ceased or temporarily ceased for longer than 14 days.	Y	
8	Final stabilization must be implemented at all applicable construction sites. Final stabilization is achieved when all ground disturbing activities are complete and all disturbed areas either have a uniform vegetative cover with individual plant density of 70 percent of pre-disturbance levels established or equivalent permanent alternative stabilization method is implemented. All temporary sediment and erosion control measures shall be removed upon final stabilization and before permit closure.	Y	
9	All permanent stormwater management facilities shall be installed as designed in the approved plans. Any proposed changes that effect the design or function of permanent stormwater management structures must be approved by the ECM Administrator prior to implementation.	Y	



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EPC Project Number: PPR2318

Revised: October 2021

		Applicant	EPC
10	Earth disturbances shall be conducted in such a manner so as to effectively minimize 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. Pre-existing vegetation shall be protected and maintained within 50 horizontal feet of a waters of the state unless shown to be infeasible and specifically requested and approved.	Y	
11	Compaction of soil must be prevented in areas designated for infiltration control measures or where final stabilization will be achieved by vegetative cover. Areas designated for infiltration control measures shall also be protected from sedimentation during construction until final stabilization is achieved. If compaction prevention is not feasible due to site constraints, all areas designated for infiltration and vegetation control measures must be loosened prior to installation of the control measure(s).	Y	
12	Any temporary or permanent facility designed and constructed for the conveyance of stormwater around, through, or from the earth disturbance area shall be a stabilized conveyance designed to minimize erosion and the discharge of sediment off-site.	Y	
13	Concrete wash water shall be contained and disposed of in accordance with the SWMP. No wash water shall be discharged to or allowed to enter State Waters, including any surface or subsurface storm drainage system or facilities. Concrete washouts shall not be located in an area where shallow groundwater may be present, or within 50 feet of a surface water body, creek or stream.	Y	
14	During dewatering operations, uncontaminated groundwater may be discharged on-site, but shall not leave the site in the form of surface runoff unless an approved State dewatering permit is in place.	Y	
15	Erosion control blanketing or other protective covering shall be used on slopes steeper than 3:1.	Y	
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.	Y	
17	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. Control measures may be required by El Paso County Engineering if deemed necessary, based on specific conditions and circumstances.	Y	
18	Tracking of soils and construction debris off-site shall be minimized. Materials tracked off-site shall be cleaned up and properly disposed of immediately.	Y	
19	The owner/developer shall be responsible for the removal of all construction debris, dirt, trash, rock, sediment, soil, and sand that may accumulate in roads, storm drains and other drainage conveyance systems and stormwater appurtenances as a result of site development.	Y	
20	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.	Y	
21	No chemical(s) having the potential to be released in stormwater are to be stored or used on-site unless permission for the use of such chemical(s) is granted in writing by the ECM Administrator. In granting approval for the use of such chemical(s), special conditions and monitoring may be required.	Y	
22	Bulk storage of allowed petroleum products or other allowed liquid chemicals in excess of 55 gallons shall require adequate secondary containment protection to contain all spills on-site and to prevent any spilled materials from entering State Waters, any surface or subsurface storm drainage system or other facilities.	Y	



3275 Akers Drive
 Colorado Springs, CO 80922
 Phone 719-520-6460
 Fax 719-520-6879
 www.elpasoco.com

EL PASO COUNTY GRADING AND EROSION CONTROL PLAN CHECKLIST

EPC Project Number: PPR2318

Revised: October 2021

		Applicant	EPC
23	No person shall cause the impediment of stormwater flow in the curb and gutter or ditch except with approved sediment control measures.	Y	
24	Owner/developer and their agents 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 of the Land Development Code, DCM Volume II and the ECM Appendix I. All appropriate permits must be obtained by the contractor prior to construction (1041, NPDES, Floodplain, 404, fugitive dust, etc.). In the event of conflicts between these requirements and other laws, rules, or regulations of other Federal, State, local, or County agencies, the most restrictive laws, rules, or regulations shall apply.	Y	
25	All construction traffic must enter/exit the site only at approved construction access points.	Y	
26	Prior to construction the permittee shall verify the location of existing utilities.	Y	
27	A water source shall be available on-site during earthwork operations and shall be utilized as required to minimize dust from earthwork equipment and wind.	Y	
28	The soils report for this site has been prepared by [Company Name, Date of Report] and shall be considered a part of these plans.	Y	
29	At least ten (10) days prior to the anticipated start of construction, for projects that will disturb one (1) acre or more, the owner or operator of construction activity shall submit a permit application for stormwater discharge to the Colorado Department of Public Health and Environment, Water Quality Division. The application contains certification of completion of a stormwater management plan (SWMP), of which this Grading and Erosion Control Plan may be a part. For information or application materials contact: Colorado Department of Public Health and Environment Water Quality Control Division WQCD – Permits 4300 Cherry Creek Drive South Denver, CO 80246-1530 Attn: Permits Unit	Y	
4. APPLICANT COMMENTS			
a			
b			
c			



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EL PASO COUNTY GRADING AND EROSION CONTROL PLAN CHECKLIST

EPC Project Number: PPR-2318

Revised: October 2021

Applicant	EPC
-----------	-----

5. CHECKLIST REVIEW CERTIFICATIONS

		Applicant	EPC
a	<p>Engineer of Record: The Grading and Erosion Control Plan was prepared under my direction and supervision and is complete and 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.</p> <p> _____ Engineer of Record Signature</p> <p>_____ 7/4/23 Date</p>	Y	Y
b	<p>Review Engineer: The Grading and Erosion Control Plan was reviewed and found to meet the checklist requirements except where otherwise noted or allowed by an approved deviation request.</p> <p>_____ Review Engineer</p> <p>_____ Date</p>		

EPC STORMWATER REVIEW COMMENTS
IN ORANGE BOXES WITH BLACK TEXT

PUMP HOUSE SIX UTILITY BUILDING

PAINT BRUSH HILLS METROPOLITAN DISTRICT

GRADING AND EROSION CONTROL PLAN

LOCATED WITHIN THE NORTHEAST QUARTER OF SECTION 26,
TOWNSHIP 12 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN,
COUNTY OF EL PASO, STATE OF COLORADO

AUGUST, 2023

SHEET INDEX

SHEET NO.	DESCRIPTION
1	COVER SHEET
2	GRADING AND EROSION CONTROL PLAN
3	EROSION CONTROL DETAILS
4	EROSION CONTROL DETAILS

CONTACTS

REVIEWING AGENCY

EL PASO COUNTY
DEVELOPMENT SERVICES DEPARTMENT
2880 INTERNATIONAL CIRCLE
COLORADO SPRINGS, CO 80910
(719) 520-6300

UTILITIES

ELECTRIC:
MOUNTAIN VIEW ELECTRIC ASSOCIATION, INC.
111140 E. WOODMAN ROAD
FALCON, CO 80831
(719) 495-2283
WWW.MVEA.COOP

OWNER

PAINT BRUSH HILLS METROPOLITAN DISTRICT
9985 TOWNER AVENUE
PEYTON, CO 80831
ROBERT GUEVARA, DISTRICT MANAGER
(719) 495-8188, FAX (719) 495-8008
EMAIL: ROBERT@PBHMD.COM

WATER & SEWER :
PAINT BRUSH HILLS METROPOLITAN DISTRICT
9830 LIBERTY GROVE AVENUE
FALCON, CO 80831
(719) 495-8188

ENGINEERING

RG AND ASSOCIATES, LLC
4885 WARD ROAD, SUITE 100
WHEAT RIDGE, CO 80033
(303) 293-8107, FAX (303) 293-8106
RICK GONCALVES, P.E.
(303) 468-8484
EMAIL: RICKG@RGENGINEERS.COM

COMMUNICATIONS:
CENTURYLINK
3556 NEW CENTER POINT
COLORADO SPRINGS, CO 80922
(719) 591-0861

COMMUNICATIONS:
FALCON BROADBAND, INC.
555 HATHAWAY DRIVE
COLORADO SPRINGS, CO 80915
(719) 573-5343

SURVEYING

AZTEC CONSULTANTS, INC.
300 EAST MINERAL AVE. SUITE 1
LITTLETON, CO 80122
(303) 713-1898

GAS:
BLACK HILLS ENERGY
18985 BASE CAMP RD A-7
MONUMENT, CO 80132
(888) 890-5554
WWW.BLACKHILLSENERGY.COM

EMERGENCY SERVICES

FIRE:
FALCON FIRE PROTECTION DISTRICT
7030 OLD MERIDIAN ROAD
FALCON, CO 80831
TRENT HARWIG, FIRE CHIEF
(719) 495-4050 FAX (719) 495-3112
WWW.FALCONFIREPD.ORG

FUGITIVE DUST DURING CONSTRUCTION

DEVELOPMENTS SHALL COMPLY WITH THE FOLLOWING STANDARDS:

- CONSTRUCTION ACTIVITY COMPLIANCE ANY PERSON ENGAGED IN GRADING, EXCAVATING, FILLING, OR OTHER CONSTRUCTION ACTIVITY OF GREATER THAN ONE ACRE SHALL BE REQUIRED TO COMPLY WITH THE REQUIREMENTS OF THE AIR QUALITY REGULATIONS, OBTAIN A CONSTRUCTION ACTIVITY PERMIT FROM EL PASO COUNTY PUBLIC HEALTH, AND COMPLY WITH APPLICABLE REQUIREMENTS.

EMISSION CONTROL PLAN REQUIRED:

- DURATION OF CONSTRUCTION EXCEEDS 6 MONTHS: THE EMISSION CONTROL PLAN SHALL BE APPROVED PRIOR TO SITE GRADING AND A STATE CONSTRUCTION PERMIT SHALL BE OBTAINED PRIOR TO BEGINNING CONSTRUCTION.
- NUISANCE CONDITIONS: REGARDLESS OF THE SIZE OR DURATION OF DEVELOPMENT, LAND DISTURBANCE SHALL BE CONDUCTED SO NUISANCE CONDITIONS ARE NOT CREATED. IF DUST EMISSIONS DO CREATE A NUISANCE, AN EMISSION CONTROL PLAN IS REQUIRED.
- EPCPH REVIEW OF EMISSION CONTROL PLANS: THE EPCPH SHALL REVIEW AND APPROVE ALL EMISSION CONTROL PLANS.
- DUST CONTROL MEASURES: ACCEPTABLE DUST CONTROL MEASURES AND OPERATING PROCEDURES FOR CONSTRUCTION ACTIVITIES MAY INCLUDE, BUT ARE NOT LIMITED TO, PLANTING VEGETATION COVER, PROVIDING SYNTHETIC COVER, WATERING, CHEMICAL STABILIZATION, FURROWS, COMPACTING, MINIMIZING DISTURBED AREA, WIND BREAKS, ON-SITE VEHICLE SPEED CONTROL, AND DELAYED SURFACE OPENING. SOLID WOOD FENCING ALONG ADJACENT DEVELOPED AREAS MAY BE REQUIRED.

HAUL TRUCKS AND HAULAGE EQUIPMENT:

- DEPOSITION OF DIRT AND MUD ON ROADS: ANY PERSON UNDERTAKING ANY CONSTRUCTION, DEMOLITION, DISMANTLING, OR EARTHMOVING ACTIVITIES SHALL PREVENT THE DEPOSIT OF DIRT, MUD, OR DEBRIS ON PUBLIC ROADS; AND SHOULD DEPOSITION OCCUR, THE DIRT, MUD OR DEBRIS SHALL BE REMOVED AS QUICKLY AS POSSIBLE BY THE PERSON PERFORMING THE ACTIVITIES.
- PARTICULATES EMISSION IN TRANSIT: PARTICULATES THAT MAY BE EMITTED IN TRANSIT SHALL BE CONTROLLED BY COVERING, WETTING OR OTHERWISE TREATING THE LOAD PRIOR TO TRANSIT.

OPEN BURNING:

- NO OPEN BURNING WITHOUT PERMIT: NO PERSON SHALL BURN OR ALLOW THE BURNING OF RUBBISH, WASTE PAPER, WOOD, OR OTHER FLAMMABLE MATERIAL ON ANY LOT, TRACT, OR PARCEL, OR ON ANY PUBLIC ROAD, ALLEY, OR OTHER LAND UNLESS AN OPEN BURNING PERMIT IS FIRST OBTAINED FROM THE EPCPH AND IN CONFORMANCE WITH THE AIR QUALITY REGULATIONS.

EROSION AND SEDIMENT CONTROL PLAN

- PURPOSE: THE PURPOSE OF THE EROSION AND SEDIMENT CONTROL PLAN IS TO CONTROL EROSION DURING CONSTRUCTION IN COMPLIANCE WITH THE REGULATIONS AND EROSION CONTROL STANDARDS OUTLINED IN THE EROSION CONTROL MANUAL.
- REQUIREMENTS FOR EROSION AND SEDIMENT CONTROL PLAN: DETAILS OF THE PLAN REQUIREMENTS AND STANDARDS ARE CONTAINED IN THE EROSION CONTROL MANUAL.
- FINANCIAL ASSURANCE REQUIRED: FINANCIAL ASSURANCE FOR ALL TEMPORARY AND PERMANENT MEASURES TO PREVENT AND CONTROL ANTICIPATED EROSION SHALL BE PROVIDED IN CONFORMANCE WITH THE EROSION CONTROL MANUAL.

OPERATIONS AND MAINTENANCE PLAN (STORMWATER QUALITY FACILITY)

- DURING AND UP TO FINAL STABILIZATION, THE CONTRACTOR SHALL CHECK AND CLEAN OFF DEBRIS AND SEDIMENT AS NEEDED: OUTLET STRUCTURES, PIPES, OUTFALL AND STORMWATER QUALITY AREA FOLLOWING EVERY MEASURABLE STORM EVENT AND EVERY 2 WEEKS (MIN.).
- UPON FINAL ACCEPTANCE AND THEN AFTER, THE OWNER WILL CHECK AND CLEAN AS NEEDED: OUTLET STRUCTURES, PIPES, OUTFALL AND STORMWATER QUALITY AREA EVERY 3 MONTHS (QUARTERLY).
- DEBRIS AND SEDIMENT SHALL BE DISPOSED OF IN AN APPROVED OFF SITE FACILITY.

PROJECT LOCATION



VICINITY MAP
1" = 2000 FEET

PUMP HOUSE #6 SDP LEGAL DESCRIPTION:

A PORTION OF:

TRACT A, PAINT BRUSH HILLS FILING NO. 12

A PORTION OF THE EAST HALF OF SECTION 26, IN TOWNSHIP 12 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, EL PASO COUNTY, COLORADO, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

TRACT A AS PLATTED IN PAINT BRUSH HILLS FILING NO. 12 RECORDED UNDER RECEPTION NO. 5226101006. RECORDS OF EL PASO COUNTY, COLORADO.

CONTAINING A CALCULATED AREA OF 153,564 SQUARE FEET OR 3.53 ACRES.

TRACT B, PAINT BRUSH HILLS FILING NO. 14

A REPLAT OF TRACT E, PAINT BRUSH HILLS FILING 13E, BEING A PORTION OF THE NE 1/4 SECTION 26, TOWNSHIP 15 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, EL PASO COUNTY, COLORADO, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

TRACT B AS PLATTED IN PAINT BRUSH HILLS FILING NO. 14 RECORDED UNDER RECEPTION NO. 5226101057. RECORDS OF EL PASO COUNTY, COLORADO.

CONTAINING A CALCULATED AREA OF 10,767 SQUARE FEET OR 0.247 ACRES, MORE OR LESS.

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 ANY NEGLIGENT ACTS, ERRORS OR OMISSIONS ON MY PART IN PREPARING THIS PLAN.

Ricardo Goncalves
RICARDO GONCALVES, PE#14506

7/7/23
DATE



OWNER/DEVELOPER'S STATEMENT:

I, THE OWNER/DEVELOPER HAVE READ AND WILL COMPLY WITH THE REQUIREMENTS OF THE GRADING AND EROSION CONTROL PLAN.

Robert Guevara

7/7/23
DATE

ROBERT GUEVARA, DISTRICT MANAGER
PAINT BRUSH HILLS METROPOLITAN DISTRICT
9985 TOWNER AVENUE
PEYTON, CO 80831

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 MANUAL, VOLUMES 1 AND 2, AND ENGINEERING CRITERIA MANUAL AS AMENDED.

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

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

DATE

PREPARED FOR:



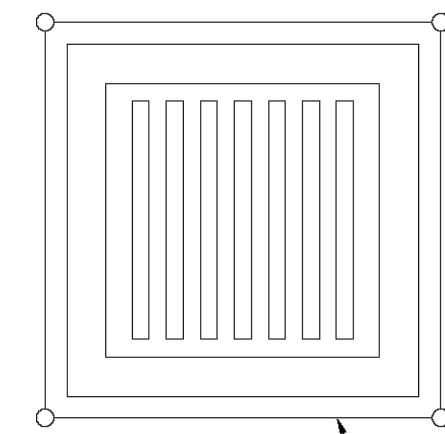
PREPARED BY:



Unresolved from Submittal 1: Provide GEC Checklist Standard notes.

PCD FILE NO. PPR-2318

RGA JOB NO. 1070.0026 - PUMP HOUSE SIX UTILITY BUILDING - PAINT BRUSH HILLS METROPOLITAN DISTRICT



FILTER FABRIC INLET PROTECTION
NTS

FILTER FABRIC INLET PROTECTION NOTES

INSTALLATION REQUIREMENTS

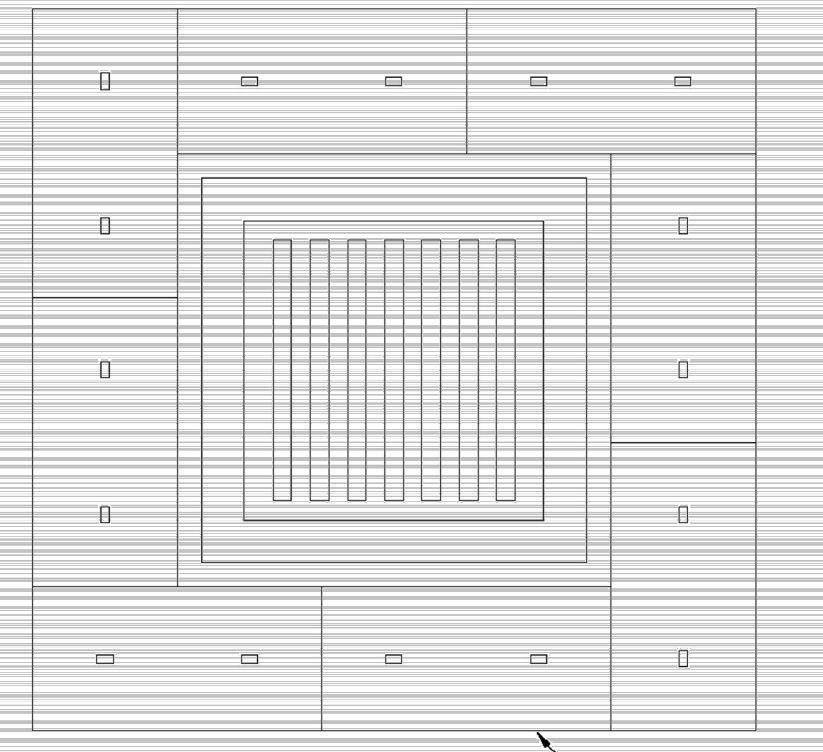
1. INLET PROTECTION SHALL BE INSTALLED IMMEDIATELY AFTER CONSTRUCTION OF INLET.
2. SEE S&T FENCE FIGURE SF-2 FOR INSTALLATION REQUIREMENTS.
3. POSTS ARE TO BE PLACED AT EACH CORNER OF THE INLET AND AROUND THE EDGES AT A MAXIMUM SPACING OF 3 FEET.

MAINTENANCE REQUIREMENTS

1. CONTRACTOR SHALL INSPECT INLET PROTECTION IMMEDIATELY AFTER EACH RAINFALL, AT LEAST DAILY DURING PROLONGED RAINFALL, AND WEEKLY DURING PERIODS NO RAINFALL.
2. DAMAGED, COLLAPSED, UNENTRENCHED OR INEFFECTIVE INLET PROTECTION SHALL BE PROMPTLY REPAIRED OR REPLACED.
3. SEDIMENT SHALL BE REMOVED FROM BEHIND FILTER FABRIC WHEN IT ACCUMULATES TO HALF THE EXPOSED GEOTEXTILE HEIGHT.
4. FILTER FABRIC PROTECTION SHALL BE REMOVED WHEN ADEQUATE VEGETATIVE COVER IS ATTAINED IN THE DRAINAGE AREA AS APPROVED BY THE CITY.

City of Colorado Springs
Stormwater Quality

Figure IP-1
Filter Fabric Inlet Protection
Construction Detail and Maintenance
Requirements



STRAW BALE INLET PROTECTION
NTS

STRAW BALE INLET PROTECTION NOTES

INSTALLATION REQUIREMENTS

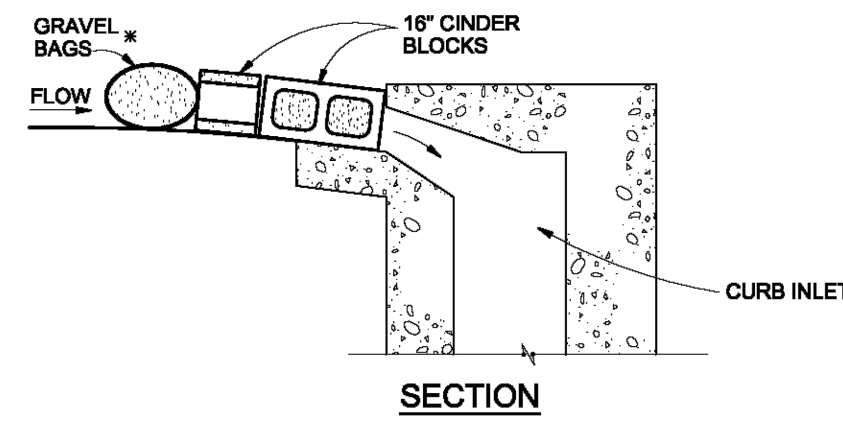
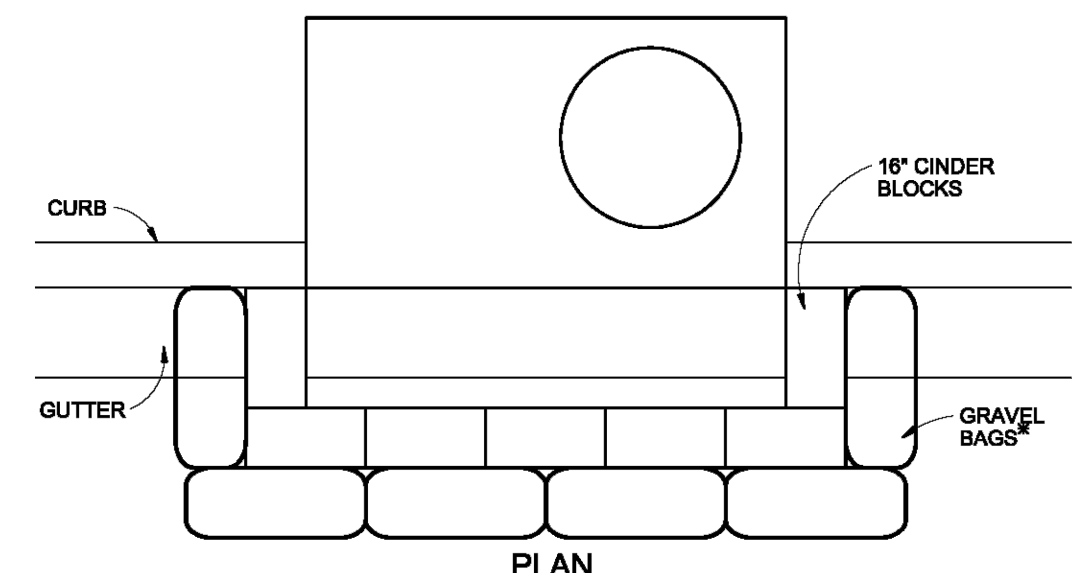
1. INLET PROTECTION SHALL BE INSTALLED IMMEDIATELY AFTER CONSTRUCTION OF INLET.
2. BALES ARE TO BE PLACED IN A SINGLE ROW AROUND THE INLET WITH THE END OF THE BALES TIGHTLY ABUTTING ONE ANOTHER.
3. SEE STRAW BALE BARRIER FIGURE SBB-2 FOR INSTALLATION REQUIREMENTS.

MAINTENANCE REQUIREMENTS

1. CONTRACTOR SHALL INSPECT STRAW BALE INLET PROTECTION IMMEDIATELY AFTER EACH RAINFALL, AT LEAST DAILY DURING PROLONGED RAINFALL, AND WEEKLY DURING PERIODS NO RAINFALL.
2. DAMAGED OR INEFFECTIVE INLET PROTECTION SHALL PROMPTLY BE REPAIRED, REPLACING BALES IF NECESSARY, AND UNENTRENCHED BALES NEED TO BE REPAIRED WITH COMPACTED BACKFILL MATERIAL.
3. SEDIMENT SHALL BE REMOVED FROM BEHIND STRAW BALES WHEN IT ACCUMULATES TO APPROXIMATELY 1/3 THE HEIGHT OF THE BARRIER.
4. INLET PROTECTION SHALL BE REMOVED WHEN ADEQUATE VEGETATIVE COVER IS ATTAINED WITHIN THE DRAINAGE AREA AS APPROVED BY THE CITY.

City of Colorado Springs
Stormwater Quality

Figure IP-2
Straw Bale Inlet Protection
Construction Detail and Maintenance
Requirements



BLOCK AND GRAVEL BAG CURB INLET PROTECTION
NTS

BLOCK AND GRAVEL BAG CURB INLET PROTECTION NOTES

INSTALLATION REQUIREMENTS

1. INLET PROTECTION SHALL BE INSTALLED IMMEDIATELY AFTER CONSTRUCTION OF INLET.
2. CONCRETE BLOCKS ARE TO BE LAID AROUND THE INLET IN A SINGLE ROW ON THEIR SIDES, ABUTTING ONE ANOTHER WITH THE OPEN ENDS OF THE BLOCK FACING OUTWARD.
3. GRAVEL BAGS ARE TO BE PLACED AROUND THE CONCRETE BLOCKS CLOSELY ABUTTING ONE ANOTHER SO THERE ARE NO GAPS.
4. GRAVEL BAGS ARE TO CONTAIN WASHED SAND OR GRAVEL APPROXIMATELY 3/4 INCH IN DIAMETER.
5. BAGS ARE TO BE MADE OF 1/4" INCH WIRE MESH (USED WITH GRAVEL ONLY) OR GEOTEXTILE.

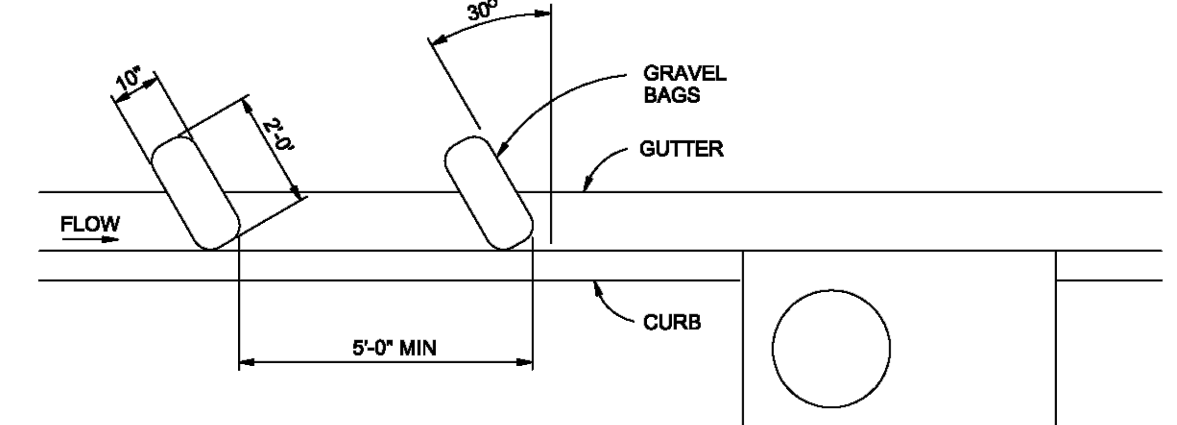
MAINTENANCE REQUIREMENTS

1. CONTRACTOR SHALL INSPECT INLET PROTECTION IMMEDIATELY AFTER EACH RAINFALL, AT LEAST DAILY DURING PROLONGED RAINFALL, AND WEEKLY DURING PERIODS NO RAINFALL.
2. DAMAGED OR INEFFECTIVE INLET PROTECTION SHALL PROMPTLY BE REPAIRED OR REPLACED.
3. SEDIMENT SHALL BE REMOVED WHEN SEDIMENT HAS ACCUMULATED TO APPROXIMATELY 1/2 THE DESIGN DEPTH OF THE TRAP.
4. INLET PROTECTION SHALL BE REMOVED WHEN ADEQUATE VEGETATIVE COVER IS ATTAINED WITHIN THE DRAINAGE AREA AS APPROVED BY THE CITY.

* AN ALTERNATE 3/4" TO 1" GRAVEL FILTER OVER A WIRE SCREEN MAY BE USED IN PLACE OF GRAVEL BAGS. THE WIRE MESH SHALL EXTEND ABOVE THE TOP OF THE CONCRETE BLOCKS AND THE GRAVEL PLACED OVER THE WIRE SCREEN TO THE TOP OF THE CONCRETE BLOCKS.

City of Colorado Springs
Stormwater Quality

Figure IP-3
Block & Gravel Bag Curb Inlet Protection
Construction Detail and Maintenance
Requirements



CURB SOCK INLET PROTECTION
NTS

CURB SOCK INLET PROTECTION NOTES

INSTALLATION REQUIREMENTS

1. INLET PROTECTION SHALL BE INSTALLED IMMEDIATELY AFTER CONSTRUCTION OF INLET.
2. SOCK IS TO BE MADE OF 1/4 INCH WIRE MESH (USED WITH GRAVEL ONLY) OR GEOTEXTILE.
3. WASHED SAND OR GRAVEL 3/4 INCH TO 4 INCHES IN DIAMETER IS PLACED INSIDE THE SOCK.
4. PLACEMENT OF THE SOCK IS TO BE 30 DEGREES FROM PERPENDICULAR IN THE OPPOSITE DIRECTION OF FLOW.
5. SOCKS ARE TO BE FLUSH WITH THE CURB AND SPACED AT A MINIMUM 5 FEET APART.
6. AT LEAST 2 CURB SOCKS IN SERIES IS REQUIRED.

MAINTENANCE REQUIREMENTS

1. CONTRACTOR SHALL INSPECT INLET PROTECTION IMMEDIATELY AFTER EACH RAINFALL, AT LEAST DAILY DURING PROLONGED RAINFALL, AND WEEKLY DURING PERIODS NO RAINFALL.
2. DAMAGED OR INEFFECTIVE INLET PROTECTION SHALL PROMPTLY BE REPAIRED OR REPLACED.
3. SEDIMENT SHALL BE REMOVED FROM BEHIND THE SOCK WHEN GUTTER WIDTH IS FILLED.
4. INLET PROTECTION SHALL BE REMOVED WHEN ADEQUATE VEGETATIVE COVER IS ATTAINED WITHIN THE DRAINAGE AREA AS APPROVED BY THE CITY.

City of Colorado Springs
Stormwater Quality

Figure IP-4
Curb Sock Inlet Protection
Construction Detail and Maintenance
Requirements

RECOMMENDED ANNUAL GRASSES				
SPECIES (COMMON NAME)	GROWTH SEASON	SEEDING DATE	POUNDS OF PURE LIVE SEED (PLS) (PLUS/ACRE)	PLANTING DEPTH (INCHES)
1. OATS	COOL	MARCH 16 - APRIL 30	35-50	1-2
2. SPRING WHEAT	COOL	MARCH 16 - APRIL 30	25-35	1-2
3. SPRING BARLEY	COOL	MARCH 16 - APRIL 30	25-35	1-2
4. ANNUAL RYEGRASS	COOL	MARCH 16 - JUNE 30	10-15	1/2
5. MILLET	WARM	MAY 16 - JULY 15	3-15	1/2-3/4
6. SUDANGRASS	WARM	MAY 16 - JULY 15	5-10	1/2-3/4
7. SORGHUM	WARM	MAY 16 - JULY 15	5-10	1/2-3/4
8. WINTER WHEAT	COOL	SEPTEMBER 1 - 30	20-35	1-2
9. WINTER BARLEY	COOL	SEPTEMBER 1 - 30	20-35	1-2
10. WINTER RYE	COOL	SEPTEMBER 1 - 30	20-35	1-2
11. TRITICALE	COOL	SEPTEMBER 1 - 30	25-40	1-2

THIS TABLE WAS TAKEN FROM UDFCD FOR RECOMMENDED ANNUAL GRASSES FOR THE DENVER METROPOLITAN AREA. THIS TABLE MAY BE USED UNLESS A SITE-SPECIFIC SEED MIX IS REQUESTED AND APPROVED.

TABLE TS-1

TEMPORARY SEEDING NOTES

INSTALLATION REQUIREMENTS

1. DISTURBED AREAS ARE TO BE SEED WITHIN 21 DAYS AFTER CONSTRUCTION ACTIVITY OR GRADING ENDS IF SEASON ALLOWS.
2. IF NECESSARY, SOIL IS TO BE CONDITIONED FOR PLANT GROWTH BY APPLYING TOPSOIL, FERTILIZER, OR LIME.
3. SOIL IS TO BE TILLED IMMEDIATELY PRIOR TO APPLYING SEEDS. COMPACT SOILS ESPECIALLY NEED TO BE LOOSENED.
4. SEEDBED DEPTH IS TO BE 4 INCHES FOR SLOPES FLATTER THAN 2:1, AND 1 INCH FOR SLOPES STEEPER THAN 2:1.
5. ANNUAL GRASSES LISTED IN TABLE TS-1 ARE TO BE USED FOR TEMPORARY SEEDING. SEED MIXES ARE NOT TO CONTAIN ANY NOXIOUS WEED SEEDS INCLUDING RUSSIAN OR CANADIAN THISTLE, KNAPWEED, PURPLE LOOSESTRIPE, EUROPEAN BINDWEED, JOHNSON GRASS, AND LEAFY SPURGE.
6. TABLE TS-1 ALSO PROVIDES REQUIREMENTS FOR SEEDING RATES, SEEDING DATES, AND PLANTING DEPTHS FOR THE APPROVED TYPES OF ANNUAL GRASSES.
7. SEEDING IS TO BE APPLIED USING MECHANICAL TYPE DRILLS EXCEPT WHERE SLOPES ARE STEEP OR ACCESS IS LIMITED THEN HYDRAULIC SEEDING MAY BE USED.
8. ALL SEEDING AREAS ARE TO BE MULCHED (SEE FACTSHEET ON MULCHING).
9. IF HYDRAULIC SEEDING IS USED THEN HYDRAULIC MULCHING SHALL BE DONE SEPARATELY TO AVOID SEEDS BECOMING ENCAPSULATED IN THE MULCH.

MAINTENANCE REQUIREMENTS

1. REGULAR INSPECTIONS ARE TO BE MADE OF ALL SEEDING AREAS TO ENSURE GROWTH.
2. AREAS WHERE GROWTH IS NOT OCCURRING QUICKLY OR THE MULCH HAS BEEN REMOVED SHALL BE RE-SEED AS SOON AS POSSIBLE AND RE-MULCHED IF NEEDED.
3. SEEDING AREAS ARE NOT TO BE DRIVEN OVER WITH CONSTRUCTION EQUIPMENT OR VEHICLES.

City of Colorado Springs
Stormwater Quality

Figure TS-1
Temporary Seeding
Construction Detail and Maintenance
Requirements

MULCHING NOTES

INSTALLATION REQUIREMENTS

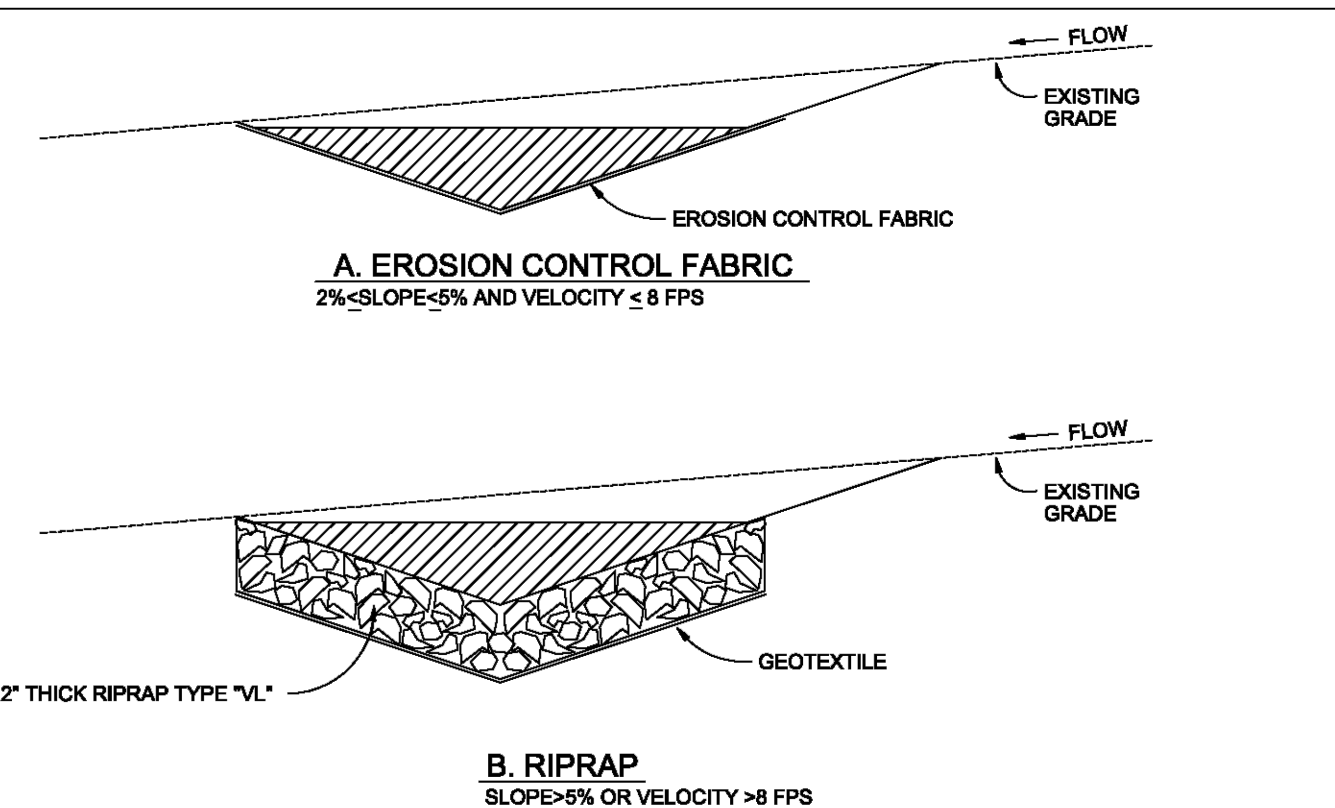
1. ALL DISTURBED AREAS MUST BE MULCHED WITHIN 21 DAYS AFTER FINAL GRADE AND SEEDING AREAS ARE TO BE MULCHED WITHIN 24 HOURS AFTER SEEDING.
2. MATERIAL USED FOR MULCH CAN BE CERTIFIED CLEAN, WEED- AND SEED-FREE LONG STEMMED FIELD OR MARSH HAY, OR STRAW OF OATS, BARLEY, WHEAT, RYE, OR TRITICALE CERTIFIED BY THE COLORADO DEPARTMENT OF AGRICULTURE WEED FREE FORAGE CERTIFICATION PROGRAM.
3. HYDRAULIC MULCHING MATERIAL SHALL CONSIST OF VIRGIN WOOD FIBER MANUFACTURED FROM CLEAN WHOLE WOOD CHIPS. WOOD CHIPS CANNOT CONTAIN ANY GROWTH OR GERMINATION INHIBITORS OR BE PRODUCED FROM RECYCLED MATERIAL. GRAVEL CAN ALSO BE USED.
4. MULCH IS TO BE APPLIED EVENLY AT A RATE OF 2 TONS PER ACRE.
5. MULCH IS TO BE ANCHORED EITHER BY CRIMPING (TUCKING MULCH FIBERS 4 INCHES INTO THE SOIL), USING NETTING (USED ON SMALL AREAS WITH STEEP SLOPES), OR WITH A TACKIFIER.
6. HYDRAULIC MULCHING AND TACKIFIERS ARE NOT TO BE USED IN THE PRESENCE OF FREE SURFACE WATER.

MAINTENANCE REQUIREMENTS

1. REGULAR INSPECTIONS ARE TO BE MADE OF ALL MULCHED AREAS.
2. MULCH IS TO BE REPLACED IMMEDIATELY IN THOSE AREAS IT HAS BEEN REMOVED, AND IF NECESSARY THE AREA SHOULD BE RESEEDING.

City of Colorado Springs
Stormwater Quality

Figure MU-1
Mulching
Construction Detail and Maintenance
Requirements



SWALE LINING
NTS

SWALE LINING NOTES

INSTALLATION REQUIREMENTS

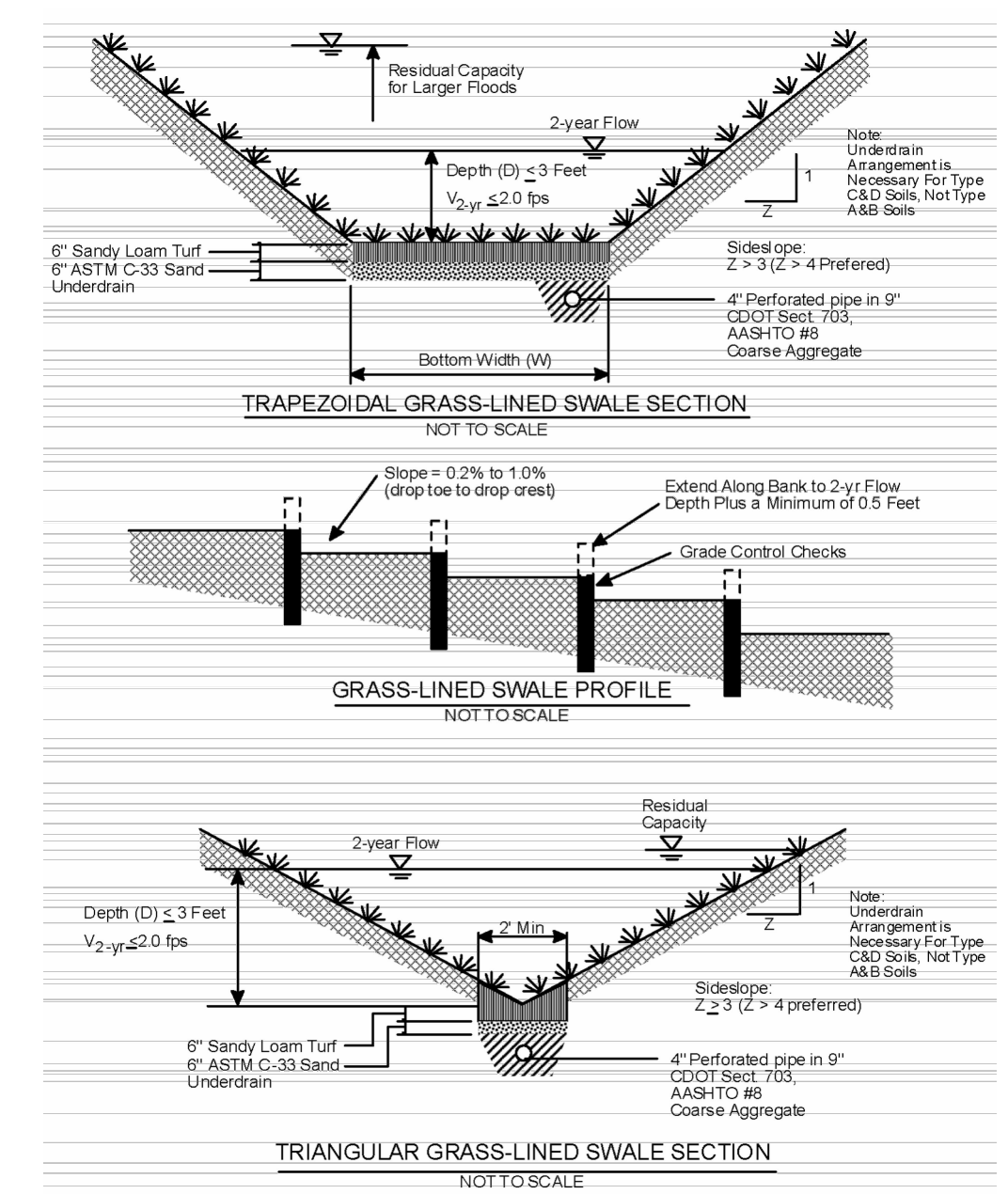
1. REFER TO THE EROSION CONTROL BLANKETS FACTSHEET FOR PROPER INSTALLATION OF EROSION CONTROL FABRIC LINING.
2. SWALES WITH EASILY EROSION SOILS AND SLOPES LESS THAN 2%, SHALL BE LINED WITH EROSION CONTROL FABRIC.
3. VELOCITIES FOR EROSION CONTROL FABRICS SHALL NOT EXCEED 8 FPS. SWALES WITH VELOCITIES GREATER THAN 8 FPS SHALL BE LINED WITH RIP RAP.

MAINTENANCE REQUIREMENTS

1. CONTRACTOR SHALL INSPECT SWALE LININGS AFTER EACH RAINFALL, AT LEAST DAILY DURING PROLONGED RAINFALL AND WEEKLY DURING PERIODS OF NO RAINFALL.
2. DAMAGED LININGS SHALL IMMEDIATELY BE REPAIRED.
3. REFER TO THE EROSION CONTROL BLANKETS FACTSHEET FOR PROPER MAINTENANCE.
4. DISPLACED RIPRAP OR COARSE AGGREGATE IS TO BE REPLACED AS SOON AS POSSIBLE.
5. SWALE LININGS ARE TO REMAIN IN PLACE AND BE PROPERLY MAINTAINED UNTIL THE TEMPORARY SWALE IS REMOVED.

City of Colorado Springs
Stormwater Quality

Figure TSW-3
Swale Linings
Construction Detail and Maintenance



NO.	DESCRIPTION	BY	DATE
1	EL PASO COUNTY SFP SUBMITTAL	JS/RG	8/14/23

PAINT BRUSH HILLS METROPOLITAN DISTRICT PUMP HOUSE SIX UTILITY BUILDING SITE DEVELOPMENT PLAN

LOCATED WITHIN THE NORTHEAST QUARTER OF SECTION 26,
TOWNSHIP 12 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN,
COUNTY OF EL PASO, STATE OF COLORADO

AUGUST, 2023

SHEET INDEX

SHEET NO.	DESCRIPTION
1	COVER SHEET
2	OVERALL TRACT PLAN
3	HORIZONTAL CONTROL PLAN
4	SITE AND UTILITY PLAN
5	ELEVATIONS
6	LANDSCAPE PLAN

CONTACTS

REVIEWING AGENCY

EL PASO COUNTY
DEVELOPMENT SERVICES DEPARTMENT
2880 INTERNATIONAL CIRCLE
COLORADO SPRINGS, CO 80910
(719) 520-6300

OWNER

PAINT BRUSH HILLS METROPOLITAN DISTRICT
9985 TOWNER AVENUE
PEYTON, CO 80831
ROBERT GUEVARA, DISTRICT MANAGER
(719) 495-8188, FAX (719) 495-8008
EMAIL: ROBERT@PBHMD.COM

ENGINEERING

RG AND ASSOCIATES, LLC
4885 WARD ROAD, SUITE 100
WHEAT RIDGE, CO 80033
(303) 293-8107, FAX (303) 293-8106
RICK GONCALVES, P.E.
(303) 468-8484
EMAIL: RICKG@RGENGINEERS.COM

SURVEYING

AZTEC CONSULTANTS, INC.
300 EAST MINERAL AVE. SUITE 1
LITTLETON, CO 80122
(303) 713-1898

EMERGENCY SERVICES

FIRE:
FALCON FIRE PROTECTION DISTRICT
7030 OLD MERIDIAN ROAD
FALCON, CO 80831
TRENT HARWIG, FIRE CHEIF
(719) 495-4050 FAX (719) 495-3112
WWW.FALCONFIREPD.ORG

UTILITIES

ELECTRIC:
MOUNTAIN VIEW ELECTRIC ASSOCIATION, INC.
111140 E. WOODMAN ROAD
FALCON, CO 80831
(719) 495-2283
WWW.MVEA.COOP

WATER & SEWER:
PAINT BRUSH HILLS METROPOLITAN DISTRICT
9830 LIBERTY GROVE AVENUE
FALCON, CO 80831
(719) 495-8188

COMMUNICATIONS:
CENTURYLINK
3556 NEW CENTER POINT
COLORADO SPRINGS, CO 80922
(719) 591-0861

COMMUNICATIONS:
FALCON BROADBAND, INC.
555 HATHAWAY DRIVE
COLORADO SPRINGS, CO 80915
(719) 573-5343

GAS:
BLACK HILLS ENERGY
18985 BASE CAMP RD A-7
MONUMENT, CO 80132
(888) 890-5554
WWW.BLACKHILLSENERGY.COM

FUGITIVE DUST DURING CONSTRUCTION

DEVELOPMENTS SHALL COMPLY WITH THE FOLLOWING STANDARDS:

- CONSTRUCTION ACTIVITY COMPLIANCE ANY PERSON ENGAGED IN GRADING, EXCAVATING, FILLING, OR OTHER CONSTRUCTION ACTIVITY OF GREATER THAN ONE ACRE SHALL BE REQUIRED TO COMPLY WITH THE REQUIREMENTS OF THE AIR QUALITY REGULATIONS. OBTAIN A CONSTRUCTION ACTIVITY PERMIT FROM EL PASO COUNTY PUBLIC HEALTH, AND COMPLY WITH APPLICABLE REQUIREMENTS.

EMISSION CONTROL PLAN REQUIRED:

- DURATION OF CONSTRUCTION EXCEEDS 6 MONTHS: THE EMISSION CONTROL PLAN SHALL BE APPROVED PRIOR TO SITE GRADING AND A STATE CONSTRUCTION PERMIT SHALL BE OBTAINED PRIOR TO BEGINNING CONSTRUCTION.
- NUISANCE CONDITIONS: REGARDLESS OF THE SIZE OR DURATION OF DEVELOPMENT, LAND DISTURBANCE SHALL BE CONDUCTED SO NUISANCE CONDITIONS ARE NOT CREATED. IF DUST EMISSIONS DO CREATE A NUISANCE, AN EMISSION CONTROL PLAN IS REQUIRED.
- EPCPH REVIEW OF EMISSION CONTROL PLANS: THE EPCPH SHALL REVIEW AND APPROVE ALL EMISSION CONTROL PLANS.
- DUST CONTROL MEASURES: ACCEPTABLE DUST CONTROL MEASURES AND OPERATING PROCEDURES FOR CONSTRUCTION ACTIVITIES MAY INCLUDE, BUT ARE NOT LIMITED TO, PLANTING VEGETATION COVER, PROVIDING SYNTHETIC COVER, WATERING, CHEMICAL STABILIZATION, FURROWS, COMPACTING, MINIMIZING DISTURBED AREA, WIND BREAKS, ON-SITE VEHICLE SPEED CONTROL, AND DELAYED SURFACE OPENING. SOLID WOOD FENCING ALONG ADJACENT DEVELOPED AREAS MAY BE REQUIRED.

HAUL TRUCKS AND HAULAGE EQUIPMENT:

- DEPOSITION OF DIRT AND MUD ON ROADS: ANY PERSON UNDERTAKING ANY CONSTRUCTION, DEMOLITION, DISMANTLING, OR EARTHMOVING ACTIVITIES SHALL PREVENT THE DEPOSIT OF DIRT, MUD, OR DEBRIS ON PUBLIC ROADS; AND SHOULD DEPOSITION OCCUR, THE DIRT, MUD OR DEBRIS SHALL BE REMOVED AS QUICKLY AS POSSIBLE BY THE PERSON PERFORMING THE ACTIVITIES.
- PARTICULATES EMISSION IN TRANSIT: PARTICULATES THAT MAY BE EMITTED IN TRANSIT SHALL BE CONTROLLED BY COVERING, WETTING OR OTHERWISE TREATING THE LOAD PRIOR TO TRANSIT.

OPEN BURNING:

- NO OPEN BURNING WITHOUT PERMIT: NO PERSON SHALL BURN OR ALLOW THE BURNING OF RUBBISH, WASTE PAPER, WOOD, OR OTHER FLAMMABLE MATERIAL ON ANY LOT, TRACT, OR PARCEL, OR ON ANY PUBLIC ROAD, ALLEY, OR OTHER LAND UNLESS AN OPEN BURNING PERMIT IS FIRST OBTAINED FROM THE EPCPH AND IN CONFORMANCE WITH THE AIR QUALITY REGULATIONS.

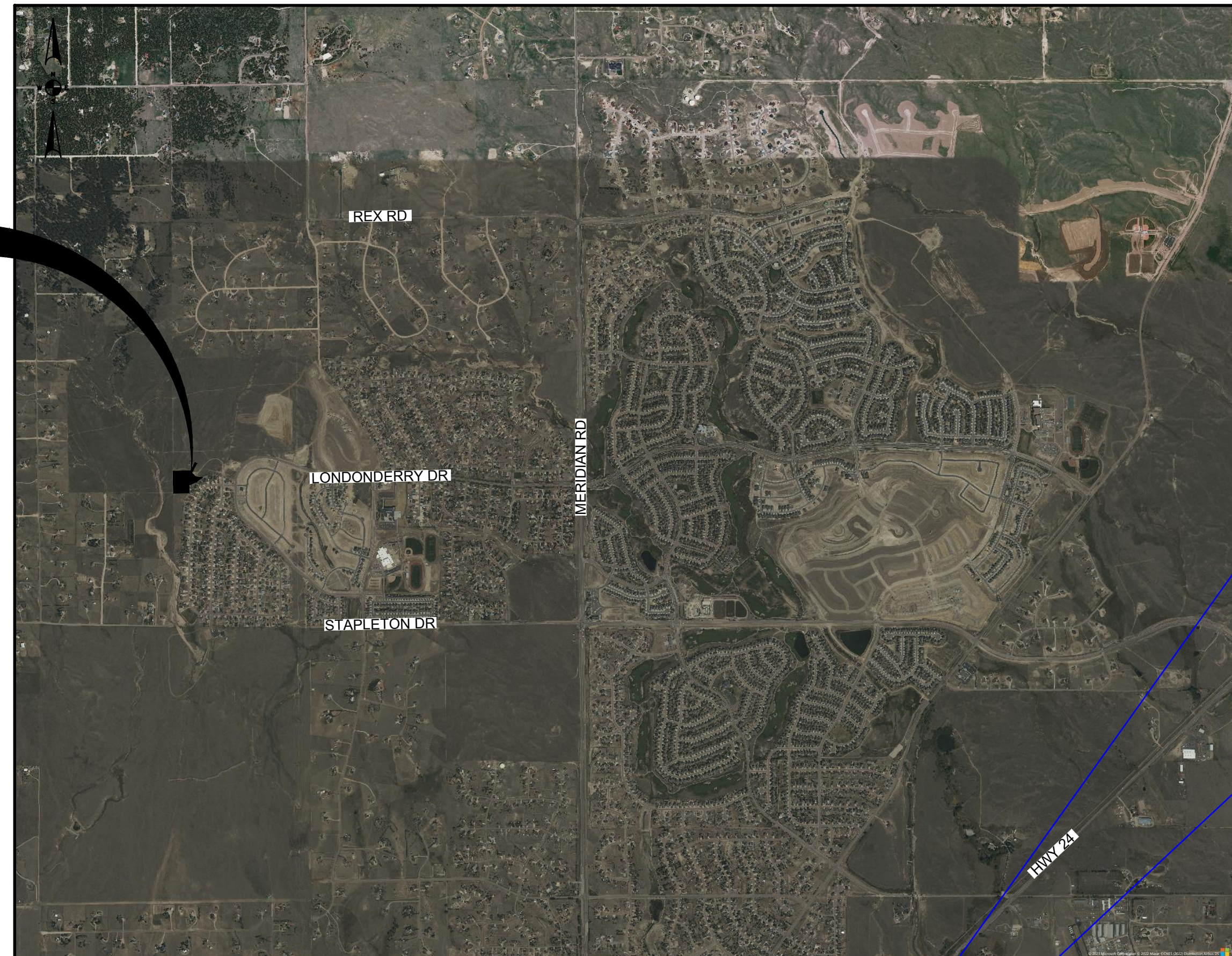
EROSION AND SEDIMENT CONTROL PLAN

- PURPOSE: THE PURPOSE OF THE EROSION AND SEDIMENT CONTROL PLAN IS TO CONTROL EROSION DURING CONSTRUCTION IN COMPLIANCE WITH THE REGULATIONS AND EROSION CONTROL STANDARDS OUTLINED IN THE EROSION CONTROL MANUAL.
- REQUIREMENTS FOR EROSION AND SEDIMENT CONTROL PLAN: DETAILS OF THE PLAN REQUIREMENTS AND STANDARDS ARE CONTAINED IN THE EROSION CONTROL MANUAL.
- FINANCIAL ASSURANCE REQUIRED: FINANCIAL ASSURANCE FOR ALL TEMPORARY AND PERMANENT MEASURES TO PREVENT AND CONTROL ANTICIPATED EROSION SHALL BE PROVIDED IN CONFORMANCE WITH THE EROSION CONTROL MANUAL.

OPERATIONS AND MAINTENANCE PLAN (STORMWATER QUALITY FACILITY)

- DURING AND UP TO FINAL STABILIZATION, THE CONTRACTOR SHALL CHECK AND CLEAN OFF DEBRIS AND SEDIMENT AS NEEDED: OUTLET STRUCTURES, PIPES, OUTFALL AND STORMWATER QUALITY AREA FOLLOWING EVERY MEASURABLE STORM EVENT AND EVERY 2 WEEKS (MIN.).
- UPON FINAL ACCEPTANCE AND THEN AFTER, THE OWNER WILL CHECK AND CLEAN AS NEEDED: OUTLET STRUCTURES, PIPES, OUTFALL AND STORMWATER QUALITY AREA EVERY 3 MONTHS (QUARTERLY).
- DEBRIS AND SEDIMENT SHALL BE DISPOSED OF IN AN APPROVED OFF SITE FACILITY.

PUMP HOUSE 6
UTILITY BUILDING



VICINITY MAP

1" = 2000 FEET

LOTS SUMMARY:

FILING 12, TRACT A:
ADDRESS: ROCKINGHAM DR.
ZONING: RS-20000
FILING 14, TRACT B:
ADDRESS: 10102 KEYNES DR.
ZONING: RS-6000

Remove. These signature blocks are meant for GEC plans, which this is labeled as a site development plan.

Remove these signature blocks
resolved - dotschoenheit
09/07/2023 1:35:39 PM

LEGAL DESCRIPTION:

A PORTION OF:

TRACT A, PAINT BRUSH HILLS FILING NO. 12

A PORTION OF THE EAST HALF OF SECTION 26, IN TOWNSHIP 12 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, EL PASO COUNTY, COLORADO, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

TRACT A AS PLATTED IN PAINT BRUSH HILLS FILING NO. 12 RECORDED UNDER RECEPTION NO. 5226101006. RECORDS OF EL PASO COUNTY, COLORADO.

CONTAINING A CALCULATED AREA OF 153,564 SQUARE FEET OR 3.53 ACRES.

TRACT B, PAINT BRUSH HILLS FILING NO. 14

A REPLAT OF TRACT E, PAINT BRUSH HILLS FILING 13E, BEING A PORTION OF THE NE 1/4 SECTION 26, TOWNSHIP 15 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, EL PASO COUNTY, COLORADO, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

TRACT B AS PLATTED IN PAINT BRUSH HILLS FILING NO. 14 RECORDED UNDER RECEPTION NO. 5226101057. RECORDS OF EL PASO COUNTY, COLORADO.

CONTAINING A CALCULATED AREA OF 10,767 SQUARE FEET OR 0.247 ACRES, MORE OR LESS.

ENGINEER'S STATEMENT:

THESE DETAILED PLANS AND SPECIFICATIONS WERE PREPARED UNDER MY DIRECTION AND SUPERVISION. SAID PLANS AND SPECIFICATIONS HAVE BEEN PREPARED ACCORDING TO THE CRITERIA ESTABLISHED BY THE COUNTY FOR DETAILED ROADWAY, DRAINAGE, GRADING AND EROSION CONTROL PLANS AND SPECIFICATIONS, AND SAID PLANS AND SPECIFICATIONS ARE IN CONFORMITY WITH APPLICABLE MASTER DRAINAGE PLANS AND MASTER TRANSPORTATION PLANS. SAID PLANS AND SPECIFICATIONS MEET THE PURPOSES FOR WHICH THE PARTICULAR ROADWAY AND DRAINAGE FACILITIES ARE DESIGNED AND ARE CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. I ACCEPT RESPONSIBILITY FOR ANY LIABILITY CAUSED BY ANY NEGLIGENT ACTS, ERRORS OR OMISSIONS ON MY PART IN PREPARATION OF THESE DETAILED PLANS AND SPECIFICATIONS.

RICARDO GONCALVES, PE#14506

DATE



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.

ROBERT GUEVARA, DISTRICT MANAGER

DATE

PAINT BRUSH HILLS METROPOLITAN DISTRICT
9985 TOWNER AVENUE
PEYTON, CO 80831

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 MANUAL, VOLUMES 1 AND 2, AND ENGINEERING CRITERIA MANUAL AS AMENDED.

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

JENNIFER IRVINE, P.E.

DATE

COUNTY ENGINEER / ECM ADMINISTRATOR

PCD FILE NO. PPR-2318

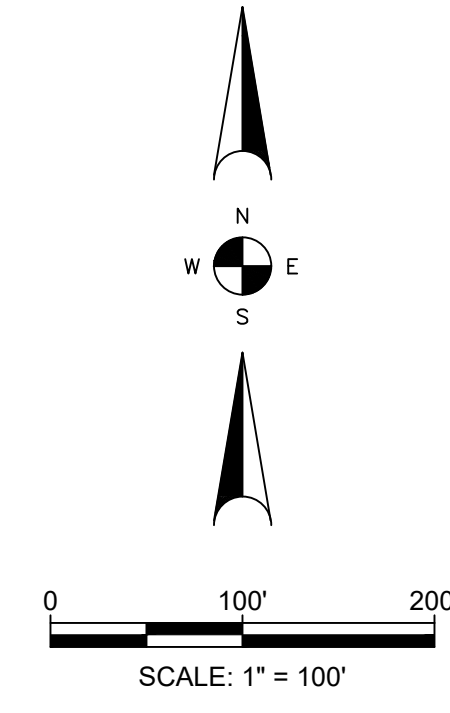
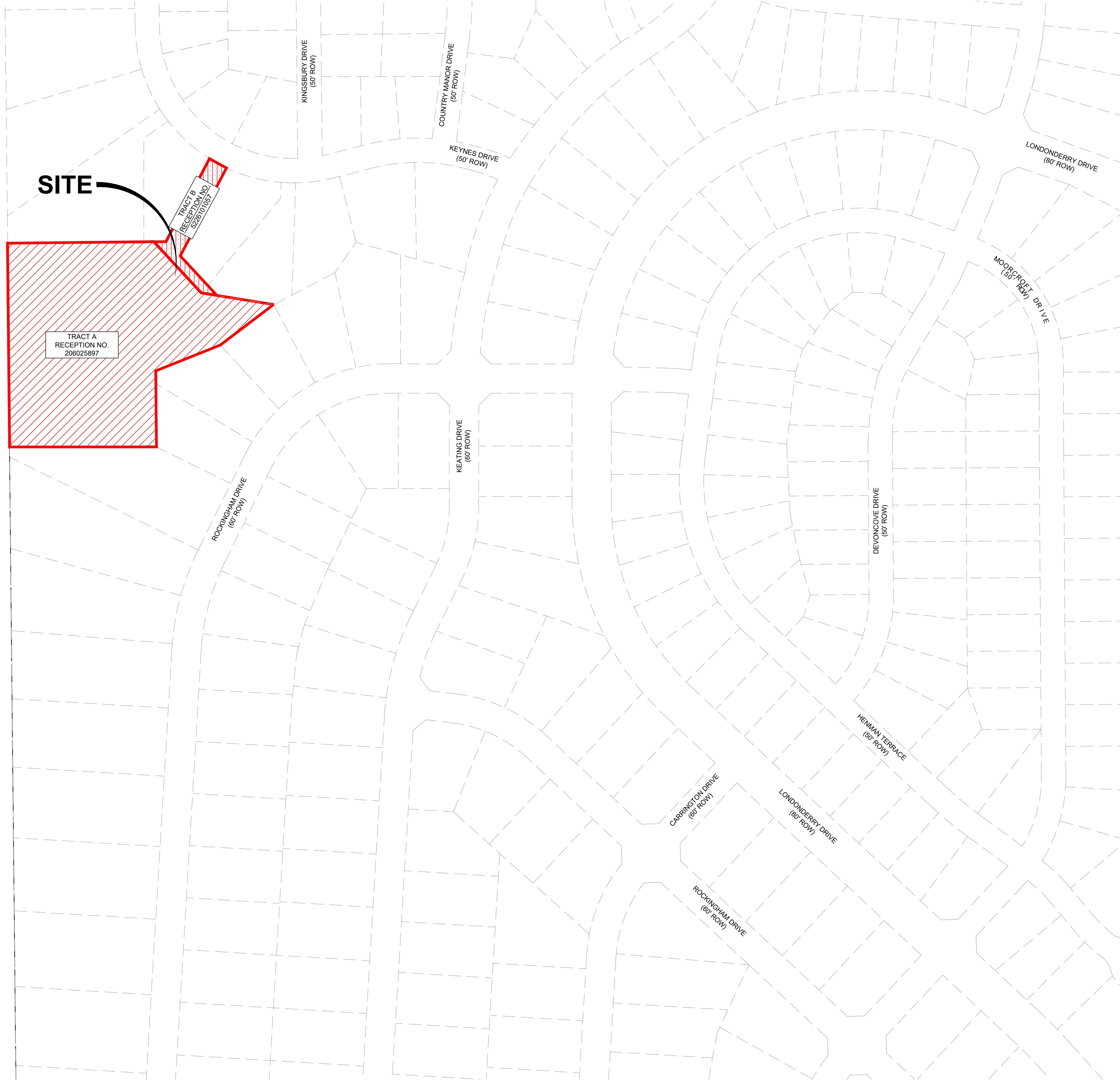
PREPARED FOR:



PREPARED BY:



RGA JOB NO. 1070.0026 - PUMP HOUSE SIX UTILITY BUILDING - PAINT BRUSH HILLS METROPOLITAN DISTRICT



48 HOURS BEFORE YOU DIG, CALL UTILITY NOTIFICATION CENTER OF COLORADO (UNCCO) **811**
 GAS, ELECTRIC, TELEPHONE, CTV, AND FIBER OPTIC PIPELINE LOCATIONS
SCALE VERIFICATION
 BAR IS ONE INCH ON ORIGINAL DRAWING
 IF NOT ONE INCH ON THIS SHEET SCALE ACCORDINGLY

NO.	DESCRIPTION	DATE	BY	REVISIONS
1	EL PASO COUNTY SDF SUBMITTAL	8/03/23	JS/RG	
2	EPC SUBMITTAL #2	8/14/23	JS	

RG AND ASSOCIATES, LLC
 4885 Ward Road, Suite 100 • Wheat Ridge, CO 80033
 Del Norte • Wheat Ridge
 303-293-8107 • www.rgengineers.com

PUMP HOUSE SIX UTILITY BUILDING
OVERALL TRACT PLAN
 PREPARED BY
 PAINT BRUSH HILLS METROPOLITAN DISTRICT
 9885 TOWNER AVENUE
 PEYTON, CO 80831

DRAWN BY:	DESIGNED BY:
JS	JS/RG
JOB NUMBER:	
1070.0026	
DATE:	
8/14/23	
SCALE:	
1" = 100'	
DRAWING DESCRIPTION:	
TRACT PLAN	
SHEET NO:	
2 of 6	

10158 KEYNES DRIVE
PEYTON, CO 80831
RECEPTION NO.
5226101017

10136 KEYNES DRIVE
PEYTON, CO 80831
RECEPTION NO.
5226101016

10114 KEYNES DRIVE
PEYTON, CO 80831
RECEPTION NO.
5226101015

10091 KEYNES DRIVE
PEYTON, CO 80831
RECEPTION NO.
5226115022

10092 KEYNES DRIVE
PEYTON, CO 80831
RECEPTION NO.
5226101014

10048 KEYNES DR.
PEYTON, CO 80831
RECEPTION NO.
5226101012

10070 KEYNES DRIVE
PEYTON, CO 80831
RECEPTION NO.
5226101013

9946 ROCKINGHAM DRIVE
PEYTON, CO 80831
RECEPTION NO.
213097174

9932 ROCKINGHAM DRIVE
PEYTON, CO 80831
RECEPTION NO. 218048282

EXISTING POND C

TRACT A

TRACT B

KEYNES DRIVE
(50' ROW)

GENERAL NOTES

- BENCHMARK: COLORADO SPRINGS UTILITIES MONUMENT F602 BEING A 2-1/2" ALUMINUM ALLOY CAP LOCATED ON THE WEST SIDE OF MERIDIAN ROAD, ABOUT 25 FEET WEST OF THE EDGE OF OIL, AND 122 FEET SOUTH OF THE INTERSECTION OF MERIDIAN ROAD AND TOURMALINE DRIVE.
ELEVATION = 7098.50 (NGVD29)
- ALL LINEAL UNITS SHOWN ARE U.S. SURVEY FEET.
- DATE OF SURVEY: THE FIELDWORK FOR THIS SURVEY WAS PERFORMED ON AUGUST 24, AND DECEMBER 12, 2020.
- THIS SURVEY DOES NOT CERTIFY TO SUBSURFACE FEATURES, IMPROVEMENTS, UTILITIES OR BURIED LINES OF ANY TYPE. LOCATION DEPICTED HEREON ARE DERIVED FROM FIELD SURVEY OF UTILITY FLAGGING / PAINT MARKING, PERFORMED BY AZTEC CONSULTANTS INC. UTILITY LOCATES DEPARTMENT ON AUGUST 17, 2020.
- THIS TOPOGRAPHY MAP DOES NOT REPRESENT A MONUMENTED LAND SURVEY AND IS ONLY INTENDED TO DEPICT SITE IMPROVEMENTS AND GROUND FEATURES AS THEY EXISTED ON THE DATE SURVEYED.
- PROJECT COORDINATES ARE MODIFIED COLORADO STATE PLANE CENTRAL ZONE 83(2011) COORDINATES. PROJECT COORDINATES ARE DERIVED FROM STATE PLANE COORDINATES USING THE FOLLOWING FORMULAS:
PROJECT NORTHING = (STATE PLANE NORTHING * 1.000000000) - 1,000,000.00
PROJECT EASTING = (STATE PLANE EASTING * 1.000000000) - 3,000,000.00

PROJECT NORTHING = (STATE PLANE NORTHING * 1.000000000) - 1,000,000.00
PROJECT EASTING = (STATE PLANE EASTING * 1.000000000) - 3,000,000.00

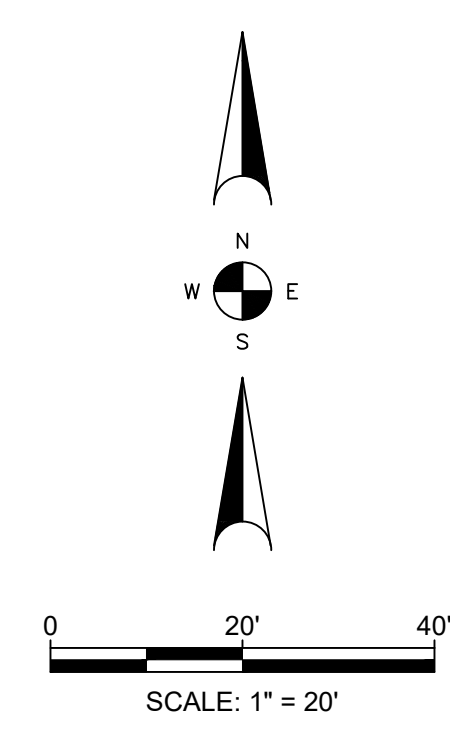
48 HOURS BEFORE YOU D Dig, CALL UTILITY NOTIFICATION CENTER OF COLORADO (UNCCO) **811**
GAS, ELECTRIC, TELEPHONE, CABLE, AND FIBER OPTIC PIPELINE LOCATIONS
SCALE VERIFICATION
BAR IS ONE INCH ON THIS SHEET IF NOT ONE INCH ON THE SHEET SCALE ACCORDINGLY

NO.	DESCRIPTION	BY	DATE
1	EL PASO COUNTY SDF SUBMITTAL	JS/RG	8/14/23
2	EPC SUBMITTAL #2	JS	8/14/23

RG AND ASSOCIATES, LLC
4885 Ward Road, Suite 100 • Wheat Ridge, CO 80033
Del Norte • Wheat Ridge
303-293-8107 • www.rgengineers.com

PUMP HOUSE SIX UTILITY BUILDING
HORIZONTAL CONTROL PLAN
PAINT BRUSH HILLS METROPOLITAN DISTRICT
9885 TOWNER AVENUE
PEYTON, CO 80831

DRAWN BY:	DESIGNED BY:
JS	JS/RG
JOB NUMBER:	1070.0026
DATE:	8/14/23
SCALE:	1" = 20'
DRAWING DESCRIPTION:	CONTROL PLAN
SHEET NO:	3 of 6



Saved: 8/14/2023 By: JSCHNEIDER Pktd: 8/14/2023 3:10 PM
 Filename: S:\1070 - PAINT BRUSH HILLS METROPOLITAN DISTRICT\1070.0014 - WELL #1\2\SITE DEVELOPMENT PLAN\DWG\04-05-PLAN.DWG

10158 KEYNES DRIVE
PEYTON, CO 80831
RECEPTION NO.
5226101017

10091 KEYNES DRIVE
PEYTON, CO 80831
RECEPTION NO.
5226115022

10136 KEYNES DRIVE
PEYTON, CO 80831
RECEPTION NO.
5226101016

10114 KEYNES DRIVE
PEYTON, CO 80831
RECEPTION NO.
5226101015

10092 KEYNES DRIVE
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213097174

9932 ROCKINGHAM DRIVE
PEYTON, CO 80831
RECEPTION NO. 218048282

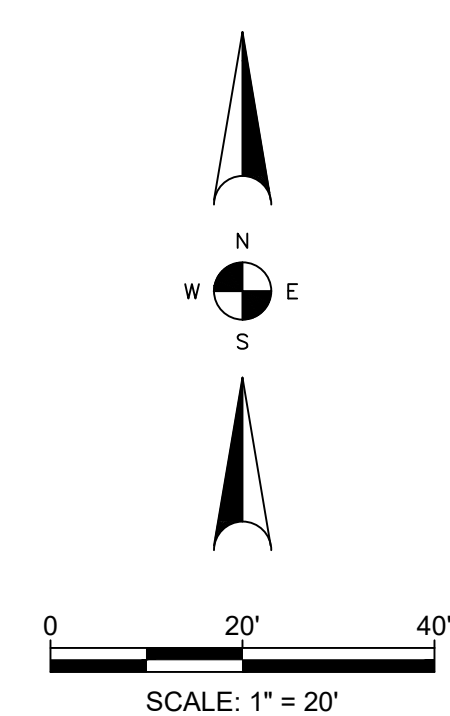
LEGEND

- EXISTING PROPERTY LINE
- EXISTING ROAD CENTERLINE
- EXISTING WATER LINE
- EXISTING SANITARY SEWER LINE
- EX 6" RAW WATER LINE
- EXISTING SANITARY SEWER MANHOLE
- EXISTING STORM SEWER MANHOLE
- EXISTING WATER WELL
- EXISTING STORM PIPE
- EXISTING WATER VALVE
- EXISTING ELECTRIC MH
- EXISTING ELECTRIC MKR
- EXISTING ELECTRIC TRANSFORMER
- EXISTING ELECTRIC UNDERGROUND
- EXISTING FIBER OPTIC UNDERGROUND
- EXISTING CABLE TV UNDERGROUND
- EXISTING GAS LINE UNDERGROUND
- PROPOSED PUMP HOUSE FOOTPRINT
- PROPOSED GRAVEL DRIVE
- PROPOSED RIP RAP

If the sidewalk has not been installed before this project starts then this project is responsible for constructing the 5" thick sidewalk.

If the sidewalk is already in place with Filing 14, this project may need to remove and replace the sidewalk if it's not constructed to a thickness of 5 inches.

NOTES:
1. GRAVEL DRIVE SHALL BE CLASS 6 AGGREGATE BASE COURSE



48 HOURS BEFORE YOU DIG, CALL UTILITY NOTIFICATION CENTER OF COLORADO (UNCCO) **811**
GAS, ELECTRIC, TELEPHONE, CABLE, AND PIPES AND OTHER UNDERGROUND UTILITIES
SCALE VERIFICATION
BAR IS ONE INCH ON ORIGINAL DRAWING
IF NOT ONE INCH ON THIS SHEET SCALE ACCORDINGLY

NO.	DESCRIPTION	BY	DATE	REVISIONS
1	EL PASO COUNTY SDF SUBMITTAL	JS/RG	8/03/23	
2	EPC SUBMITTAL #2	JS	8/14/23	

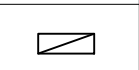
ERG AND ASSOCIATES, LLC
4885 Ward Road, Suite 100 • Wheat Ridge, CO 80033
Del Norte • Wheat Ridge
303-293-8107 • www.ergengineers.com

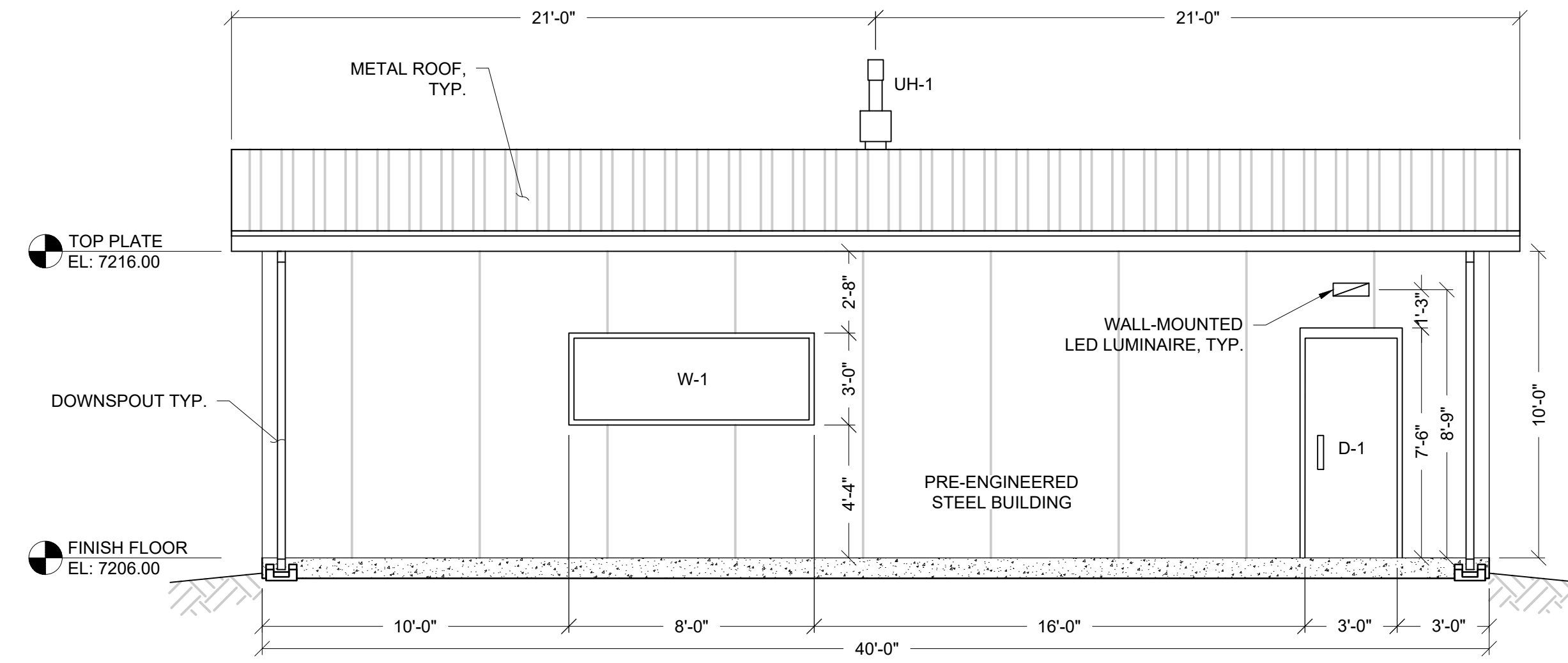
PUMP HOUSE SIX UTILITY BUILDING
SITE AND UTILITY PLAN
PAINT BRUSH HILLS METROPOLITAN DISTRICT
9885 TOWNER AVENUE
PEYTON, CO 80831

DRAWN BY:	DESIGNED BY:
JS	JS/RG
JOB NUMBER:	1070.0026
DATE:	8/14/23
SCALE:	1" = 20'
DRAWING DESCRIPTION:	SITE PLAN
SHEET NO.:	4 of 6

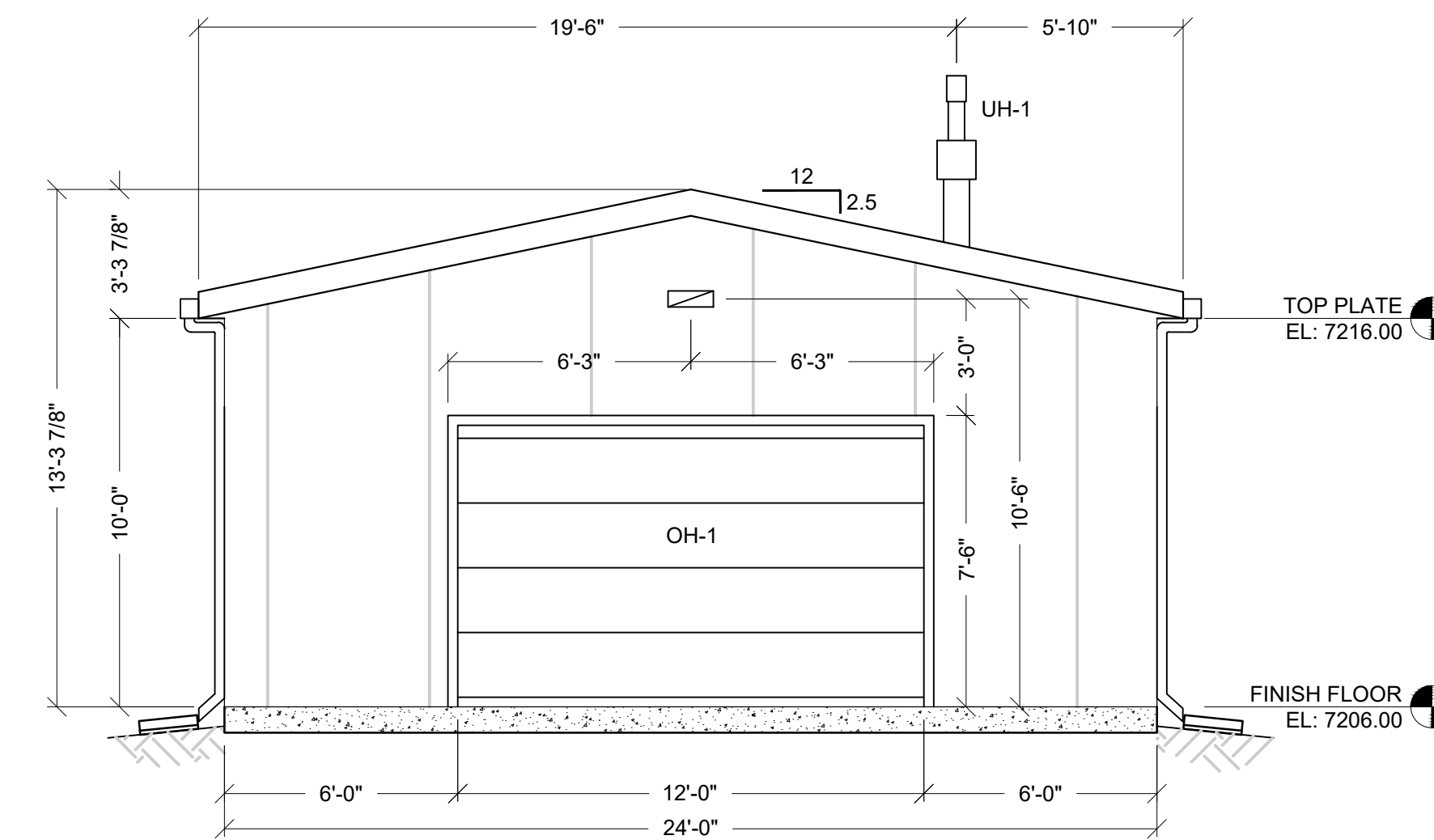
Saved: 8/14/2023 By: JSCHNEIDER Pktd: 8/14/2023 3:10 PM
 Filename: S:\1070 - PAINT BRUSH HILLS METROPOLITAN DISTRICT\1070.0014 - WELL #1\2\SITE DEVELOPMENT PLAN\DWG\04-05-PLAN.DWG

- NOTES:
1. ROOF SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
 2. PROFESSIONAL ENGINEER'S STAMP APPLIES ONLY TO THIS SHEET AND DOES NOT APPLY TO SUPERSTRUCTURE OR FOUNDATION DRAWINGS.
 3. BUILDING MANUFACTURER SHALL PROVIDE ALL SUPPORTS FOR MOUNTING, WALL PENETRATIONS, AND TRIM. MANUFACTURER SHALL ALSO PROVIDE ALL WALL PANELS, FRAMING, SUPPORTS, CONNECTIONS, AND BUILDING-RELATED ITEMS.
 4. REFER TO SHEET A2 FOR DOOR AND HARDWARE SCHEDULE.

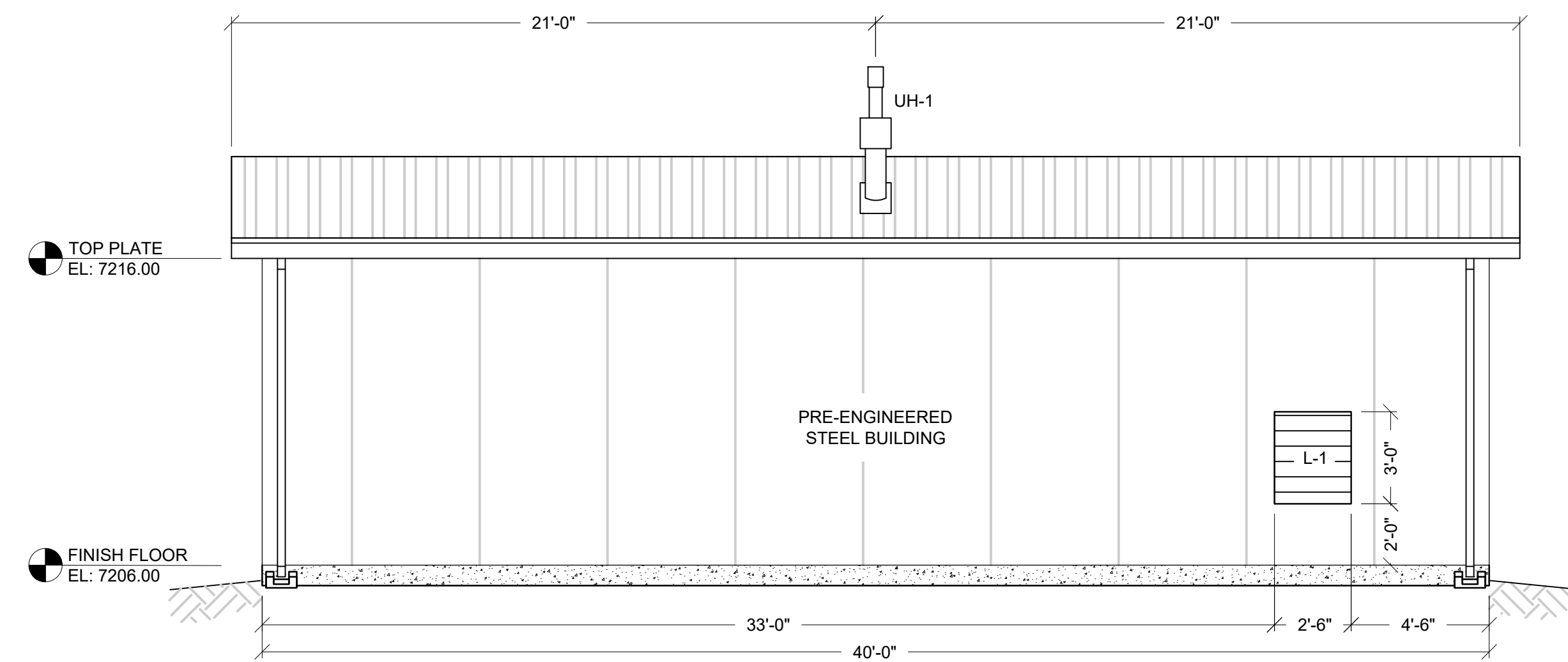
LIGHTING FIXTURE SCHEDULE						
SYMBOL	QTY.	MFR.	CATALOG NUMBER	DESCRIPTION	MTG.	INPUT VA
	3	NUVO LIGHTING	65-671	LED WALL-PACK, CUT-OFF TYPE, 120-277VAC, WT: 5 LB. BRONZE, IP 65 RATED, LENSE-IMPACT RESISTANT PC.	WALL 10'-6" AFF	40



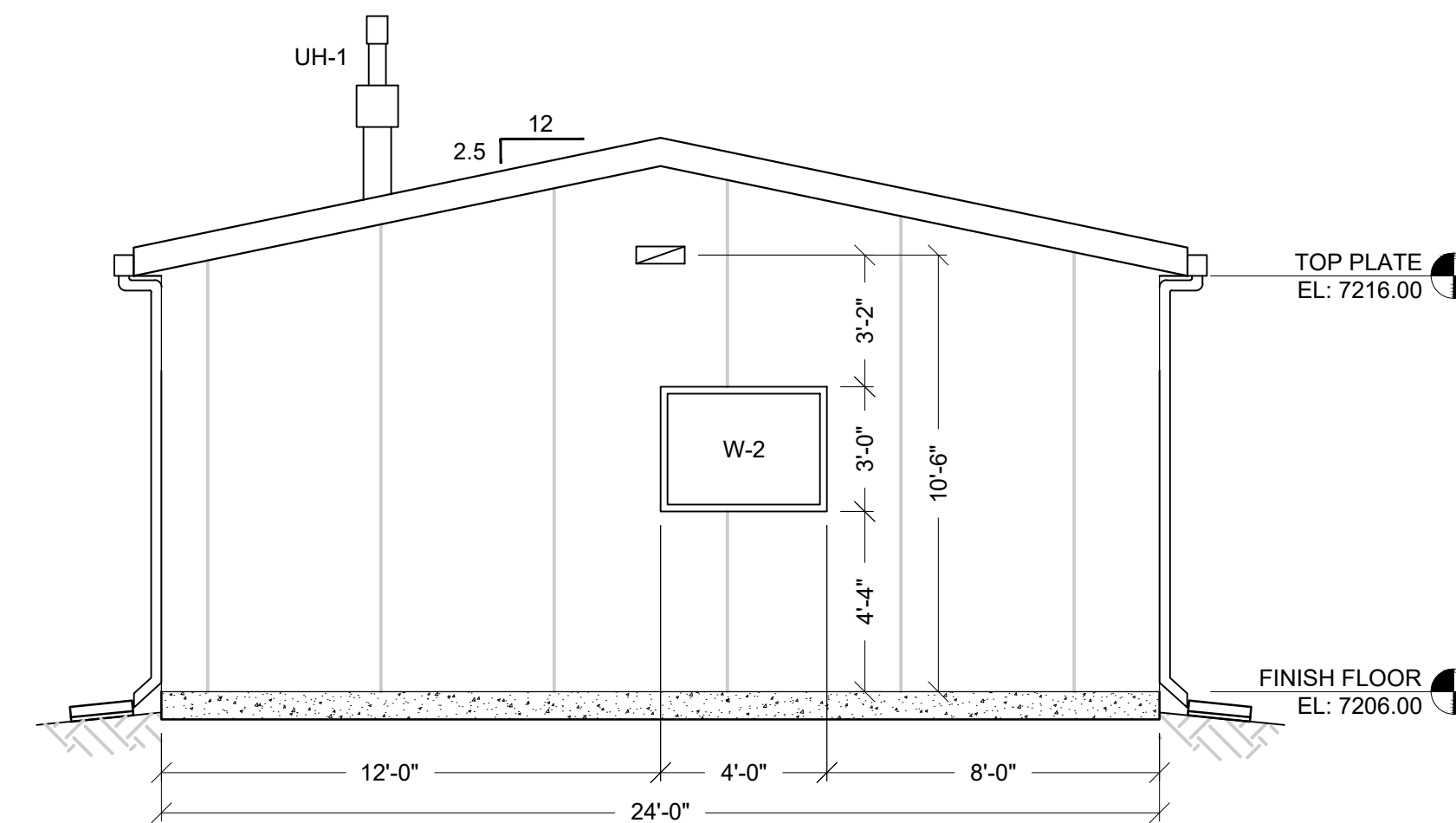
NORTHEAST ELEVATION
1/4" = 1'-0"



NORTHWEST ELEVATION
1/4" = 1'-0"



SOUTHWEST ELEVATION
1/4" = 1'-0"



SOUTHEAST ELEVATION
1/4" = 1'-0"

48 HOURS BEFORE YOU DELIVER CALL UTILITY NOTIFICATION CENTER OF COLORADO (UNCCO) **811**
GAS, ELECTRIC, TELEPHONE, CATV, AND PIPES AND CABLES ARE LOCATED IN THIS AREA. SCALE VERIFICATION BAR IS ONE INCH ON THIS SHEET IF NOT ONE INCH ON THIS SHEET SCALE ACCORDINGLY.

NO.	DESCRIPTION	DATE	BY
1	EL PASO COUNTY SDF SUBMITTAL	8/14/23	JCS
2	EPC SUBMITTAL #2	8/14/23	JS

RG AND ASSOCIATES, LLC
4885 Ward Road, Suite 100 • Wheat Ridge, CO 80033
Del Norte • Wheat Ridge
303-293-8107 • www.rgengineers.com

PUMP HOUSE SIX UTILITY BUILDING
ELEVATIONS
PAINT BRUSH HILLS METROPOLITAN DISTRICT
9885 TOWNER AVENUE
PEYTON, CO 80831

DRAWN BY:	DESIGNED BY:
JS	JS/RG
JOB NUMBER:	
1070.0026	
DATE:	
8/14/23	
SCALE:	
1/4" = 1'-0"	
DRAWING DESCRIPTION:	
ELEVATIONS	
SHEET NO:	
5 of 6	2

10158 KEYNES DRIVE
PEYTON, CO 80831

RECEPTION NO.
5226101017

10136 KEYNES DRIVE
PEYTON, CO 80831

RECEPTION NO.
5226101016

10114 KEYNES DRIVE
PEYTON, CO 80831

RECEPTION NO.
5226101015

10092 KEYNES DRIVE
PEYTON, CO 80831

RECEPTION NO.
5226101014

10070 KEYNES DRIVE
PEYTON, CO 80831

RECEPTION NO.
5226101013

10091 KEYNES DRIVE
PEYTON, CO 80831

RECEPTION NO.
5226115022


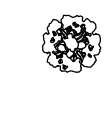
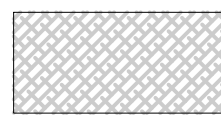
9932 ROCKINGHAM DRIVE
PEYTON, CO 80831

RECEPTION NO. 218048282

PROPERTY INFORMATION:

TOTAL LOT SIZE: 3.78 ACRES
ZONING: RESIDENTIAL SUBURBAN

LEGEND

- ①  10 EACH CURL-LEAF MOUNTAIN MAHOAGANY (15' HEIGHT) CERCOCARPUS LEDIFOLIUS
- ②  10 EACH FERNBUSH (4' HEIGHT) CHAMAEBATIARIA MILLEFOLIUM
-  BARK MULCH

LANDSCAPE SUMMARY:

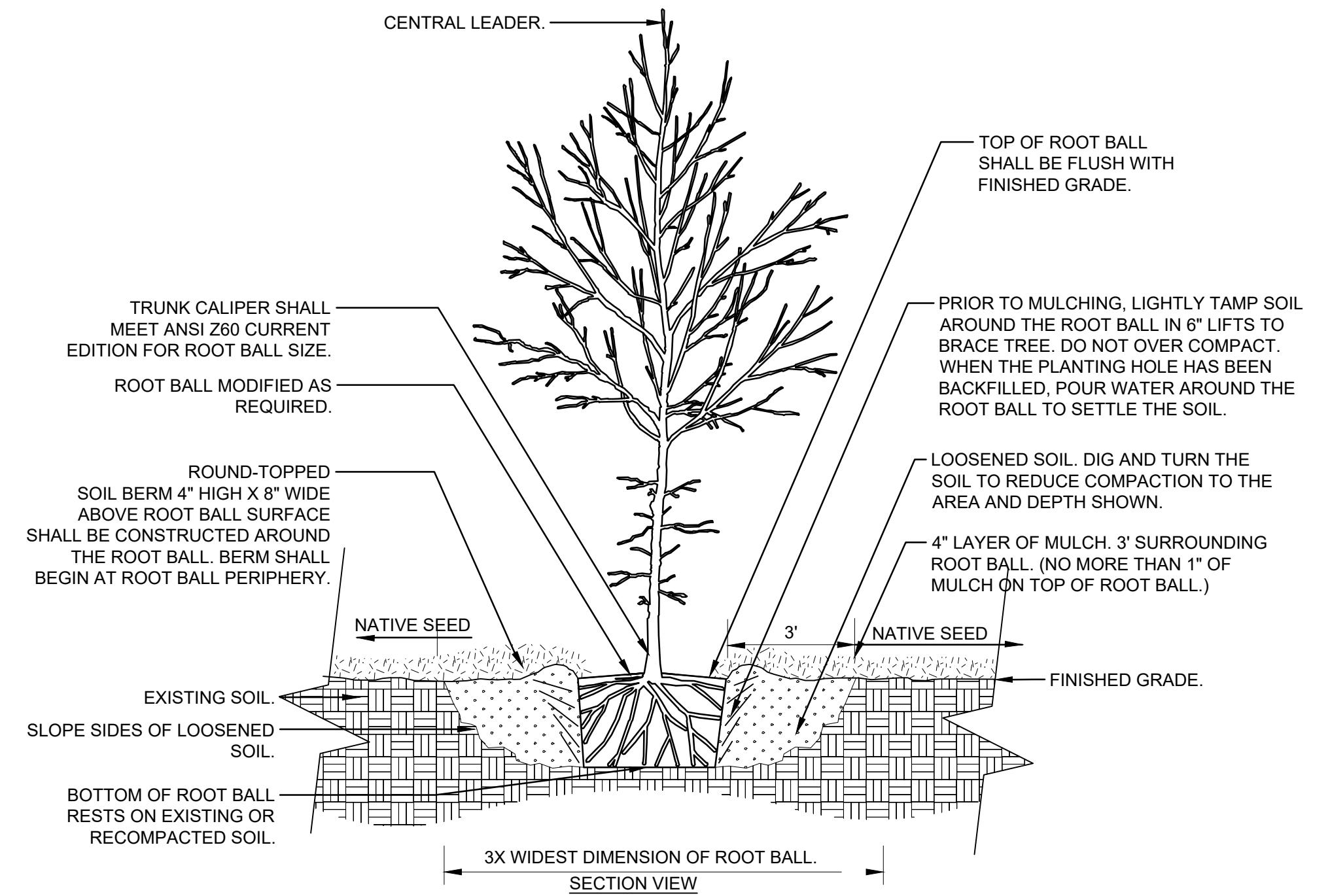
TOTAL SITE AREA = 0.64 ACRES (27,945 SF)

LANDSCAPE (RLA):	REQUIRED	PROVIDED
5% = 1,375 SF	5% = 1,375 SF	1,861 SF
75% LIVE	75% LIVE	85% LIVE
INTERIOR LANDSCAPING:		
TREES (1 1/2" CAL.)	1/250 SF = 6 TREES	10 TOTAL
SHRUBS (5 GAL.)	10/TREE (UP TO 50%)	10 TOTAL

IMPROVEMENTS:

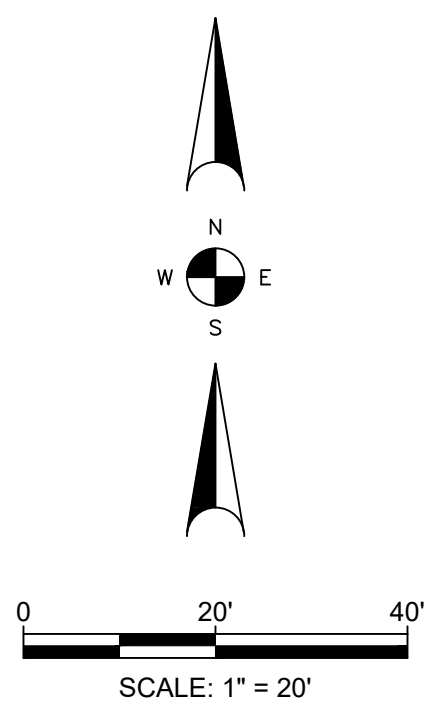
TOTAL BUILDING AREA	960 SF (0.022 ACRES)
TOTAL GRAVEL AREA	4,888 SF (0.11 ACRES)
TOTAL PARKING SPACES	3
TOTAL DWELLINGS	0

ZONING: RS-6000 AND RS-20000



TREE w/ BERM (EXISTING SOIL NOT MODIFIED)

NTS



48 HOURS BEFORE YOU DIG, CALL UTILITY NOTIFICATION CENTER OF COLORADO (UNCCO) **811** GAS, ELECTRIC, TELEPHONE, CABLE, AND PIPES. HANDLE EASTERN PIPELINE LOCATIONS SCALE VERIFICATION BAR IS ONE INCH ON ORIGINAL DRAWING IF NOT ONE INCH ON THIS SHEET SCALE ACCORDINGLY.

NO.	DESCRIPTION	DATE	BY	REVISIONS
1	EL PASO COUNTY SDF SUBMITTAL	8/03/23	JS/RG	
2	EPC SUBMITTAL #2	8/14/23	JS	

RG AND ASSOCIATES, LLC
4885 Ward Road, Suite 100 • Wheat Ridge, CO 80033
Del Norte • Wheat Ridge
303-293-8107 • www.rgengineers.com

PUMP HOUSE SIX UTILITY BUILDING
LANDSCAPE PLAN
PREPARED FOR
PAINT BRUSH HILLS METROPOLITAN DISTRICT
9885 TOWNER AVENUE
PEYTON, CO 80831

DRAWN BY:	DESIGNED BY:
JS	JS/RG
JOB NUMBER:	
1070.0026	
DATE:	
8/14/23	
SCALE:	
1" = 20'	
DRAWING DESCRIPTION:	
LANDSCAPING	
SHEET NO:	
6 of 6	

June 1, 2023 *Revised August 13, 2023*

Paint Brush Hills Metropolitan District
9985 Towner Avenue
Falcon, CO 80831

RE: Drainage Letter for Paint Brush Hills Metropolitan District's Pump House 6 within Paint Brush Hills Filing 12 Tract A and 14 Tract B

To Whom It May Concern:

The Paint Brush Hills Metropolitan District (PBHMD) is located in Peyton, Colorado in unincorporated El Paso County. This drainage conformance letter pertains to the PBHMD project called the Pump House 6 Site Development Plan (Site) and is located southeast of the intersection of Keynes Drive and Kingsbury Drive and is west of Rockingham Drive and Keating Drive within the Paint Brush Hills Filing No. 14. The Site is located in the NW $\frac{1}{4}$, Section 25, Township 12 South, Range 65 West of the 6th PM, County of El Paso, State of Colorado.

The Site was previously studied for drainage improvements as a part of the Final Drainage Report for Paint Brush Hills – Phase 2 (Filing No. 13 EDAPC File Number SF0538) which was prepared in October 2005 and with the latest revision date of June 2008. This site includes a small area in the northern portion of the Paint Brush Hills Filing 12, Tract A and Tract B of the Paint Brush Hills Filing No. 14. In general, the Site drains north-east to south-west toward the Detention Pond "C" in Tract A. This area is within sub-basins "XX2", "YY" and "ZZ" of the Filing No. 13 Final Drainage Report.

The Filing No. 13 Phase 2 site is planned for a single-family home development with over 550 homes (in the 2,000+ square foot range), a 10-acre elementary school site, a 6-acre community commercial site and 44 acres of trails and open space. The Filing 13 site has provided for regional detention and water quality for the overall site development.

The PBHMD Pump House 6 Site Development Plan (26' x 42') within the single-family development with its respective gravel access driveway out to Keynes Drive. The area of imperviousness for the site is the well house roof and associated concrete pads at 1,177 SF and gravel driveway at 4,888 SF, for a total of 6,065 SF of imperviousness.

This area was subsequently studied as a part of the Preliminary/Final for Paint Brush Hills Filing No. 14 (EDPAC File Number SF2024) dated March 2021. The PBHMD Pump House 6 Site Development Plan is primarily within sub-basin N and minor portions with sub-basin C and Sub-basin M of the Filing No. 14 Drainage Report. Sub-basin N appears to correspond to sub-basin ZZ and sub-basin YY from the Filing 13 Drainage Report. The summary of flows for Filing No. 13, Filing No. 14 and the proposed PHHMD Pump House 6 are shown in the following table.

Sub-Basin	Area (acres)	C ₅	C ₁₀₀	Q ₅ (cfs)	Q ₁₀₀ (cfs)
XX2	5.72	0.35	0.45	7 cfs	16 cfs
YY	1.85	0.35	0.45	2 cfs	5 cfs
ZZ	7.01	0.30	0.40	6 cfs	13 cfs
Total (FDS Filing No 13)	14.85			15 cfs	34 cfs
C	11.80	0.28	0.48	9.2 cfs	28.6 cfs
M	2.53	0.27	0.48	2.6 cfs	7.8 cfs
N	8.94	0.20	0.44	6.2 cfs	23.0 cfs
Total (FDS Filing No 14)	23.27			18.0 cfs	59.6 cfs
C (proposed)	11.80	0.28	0.48	9.2 cfs	28.6 cfs
M (proposed)	2.53	0.27	0.48	2.6 cfs	7.8 cfs
N (proposed)	8.94	0.21	0.45	6.4 cfs	23.2 cfs
Total (PBHMD Pump 6)	23.27			18.2 cfs	59.8 cfs
Change in Flow				+0.2 cfs	+0.2 cfs

For the purposes these calculation C-value and rainfall intensities used in the Filing No. 14 Drainage Report were replicated for the PBHMD Pump House 6 plan to obtain comparable calculations. For sub-basin C and sub-basin M gravel driveway imperviousness in the amount 650 square-feet and 260 square-feet were added, respectively. The gravel driveway added were insignificant and did not have an impact upon either the imperviousness or flow rates for sub-basin C and sub-basin M. For sub-basin N the addition of 4,888 square-feet of gravel driveway and 1,177 square-feet roof /concrete increase the sub-basin imperviousness by 1.3-percent and increases the 5-year and 100-year flow rate both by 0.2 cfs.

The increase in imperviousness for sub-basin N by 1.3-percent translates to a 0.08-percent increase in imperviousness for the Detention Pond "C" and will have negligible impacts on the volume required and the water surface elevation (the difference change the pond volume requirement by approximately 400 cubic-feet or less than 0.1-percent).

Due to the minimal amount of imperviousness created by the proposed Pump House 6 and associated access drive, which were planned for with the development of the Paint Brush Hills Filing No. 14, it will not have any adverse drainage effects on any of the adjacent property and will not require any additional detention or water quality facilities.

Two drainage swales and associated riprap rundowns have been added to the site. The swale along the roadside ditch was designed to convey 2.2 cfs and the swale around the building was designed to convey 0.5 cfs. Both swales will be grass-lined until reach the side of the pond from there the swales will be riprap lined.



If you have any questions or concerns with drainage concepts associated with this proposed construction, please contact me at 303-293-8107.

Sincerely,

Gary E. Welp, P.E., CFM

Attachments



Drainage Reports

Design Engineer's Statement:

The attached drainage plan and report were prepared under my direction and supervision and are correct to the best of my knowledge and belief. Said drainage report has been prepared according to the criteria established by the County for drainage reports and said report is in conformity with the applicable master plan of the drainage basin. I accept responsibility for any liability caused by any negligent acts, errors or omissions on my part in preparing this report.

[Name, P.E. # _____]

Date

Owner/Developer's Statement:

I, the owner/developer have read and will comply with all of the requirements specified in this drainage report and plan.

[Name, Title]
[Business Name]
[Address]

Date

El Paso County:

Filed in accordance with the requirements of the Drainage Criteria Manual, Volumes 1 and 2, El Paso County Engineering Criteria Manual and Land Development Code as amended.

County Engineer / ECM Administrator

Date

Conditions:

Please add standard signature blocks with Engineer stamp/sign and owner sign/date

Area-Weighted Runoff Coefficient Calculations

Version 2.00 released May 2017

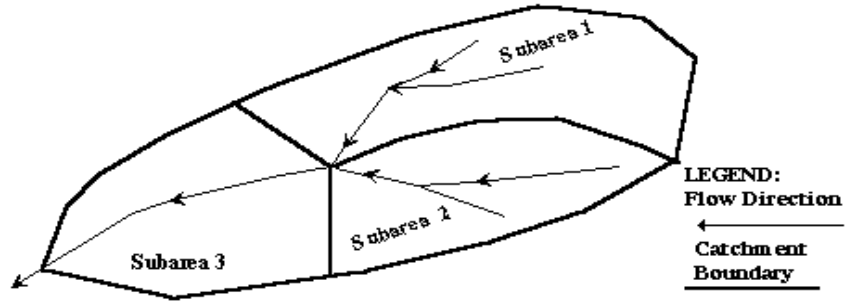
Designer: Gary E. Welp, PE, CFM

Company: RGA

Date: 8/13/2023

Project: Paintbrush Hills Well #12

Location: Peyton, CO



Subcatchment Name
N

Cells of this color are for required user-input
Cells of this color are for optional override values
Cells of this color are for calculated results based on overrides

See sheet "Design Info" for imperviousness-based runoff coefficient values.

Sub-Area ID	Area (ac)	NRCS Hydrologic Soil Group	Percent Imperviousness	Runoff Coefficient, C						
				2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	500-yr
landscape	3.07	B	2.0	0.01	0.01	0.07	0.26	0.34	0.44	0.54
					0.16				0.41	
gravel	0.09	B	80.0	0.64	0.67	0.70	0.75	0.77	0.80	0.83
					0.80				0.85	
building	0.03	B	90.0	0.74	0.76	0.78	0.81	0.83	0.84	0.87
					0.90				0.95	
residential	5.75	B	20.0	0.13	0.15	0.22	0.37	0.44	0.52	0.61
					0.22				0.46	
15										
Total Area (ac)	8.94			0.09	0.11	0.18	0.34	0.41	0.49	0.59
			Area-Weighted C							
			Area-Weighted Override C	0.09	0.21	0.18	0.34	0.41	0.45	0.59

Area-Weighted Runoff Coefficient Calculations

Version 2.00 released May 2017

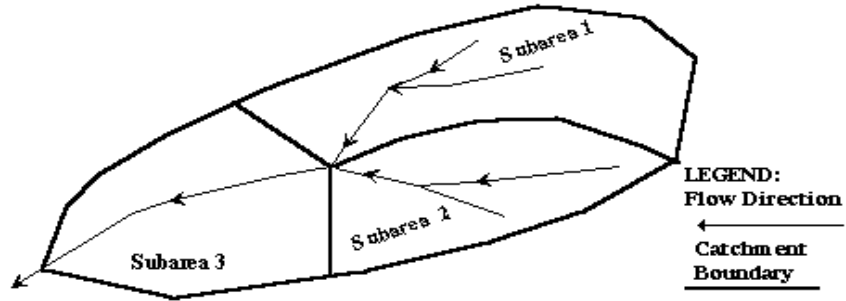
Designer: Gary E. Welp, PE, CFM

Company: RGA

Date: 8/13/2023

Project: Paintbrush Hills Well #12

Location: Peyton, CO



Subcatchment Name
M

Cells of this color are for required user-input
Cells of this color are for optional override values
Cells of this color are for calculated results based on overrides

See sheet "Design Info" for imperviousness-based runoff coefficient values.

Sub-Area ID	Area (ac)	NRCS Hydrologic Soil Group	Percent Imperviousness	Runoff Coefficient, C						
				2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	500-yr
landscape	0.00	B	2.0	0.01	0.01	0.07	0.26	0.34	0.44	0.54
					0.16				0.41	
gravel	0.01	B	80.0	0.64	0.67	0.70	0.75	0.77	0.80	0.83
					0.80				0.85	
building	0.00	B	90.0	0.74	0.76	0.78	0.81	0.83	0.84	0.87
					0.90				0.95	
residential	2.52	B	20.0	0.13	0.15	0.22	0.37	0.44	0.52	0.61
					0.27				0.48	
20										
Total Area (ac)	2.53		Area-Weighted C	0.13	0.15	0.22	0.38	0.44	0.52	0.61
			Area-Weighted Override C	0.13	0.27	0.22	0.38	0.44	0.48	0.61

Area-Weighted Runoff Coefficient Calculations

Version 2.00 released May 2017

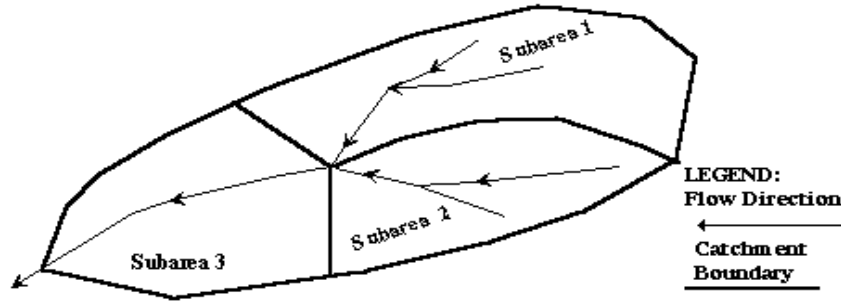
Designer: Gary E. Welp, PE, CFM

Company: RGA

Date: 8/13/2023

Project: Paintbrush Hills Well #12

Location: Peyton, CO



Subcatchment Name
C

Cells of this color are for required user-input
Cells of this color are for optional override values
Cells of this color are for calculated results based on overrides

See sheet "Design Info" for imperviousness-based runoff coefficient values.

Sub-Area ID	Area (ac)	NRCS Hydrologic Soil Group	Percent Imperviousness	Runoff Coefficient, C							
				2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	500-yr	
landscape	0.00	B	2.0	0.01	0.01	0.07	0.26	0.34	0.44	0.54	
					0.16				0.41		
gravel	0.01	B	80.0	0.64	0.67	0.70	0.75	0.77	0.80	0.83	
					0.80				0.85		
building	0.00	B	90.0	0.74	0.76	0.78	0.81	0.83	0.84	0.87	
					0.90				0.95		
residential	11.79	B	20.0	0.13	0.15	0.22	0.37	0.44	0.52	0.61	
					0.26				0.48		
20											
Total Area (ac)	11.80			Area-Weighted C	0.13	0.15	0.22	0.38	0.44	0.52	0.61
				Area-Weighted Override C	0.13	0.26	0.22	0.38	0.44	0.48	0.61

Area-Weighted Runoff Coefficient Calculations

Version 2.00 released May 2017

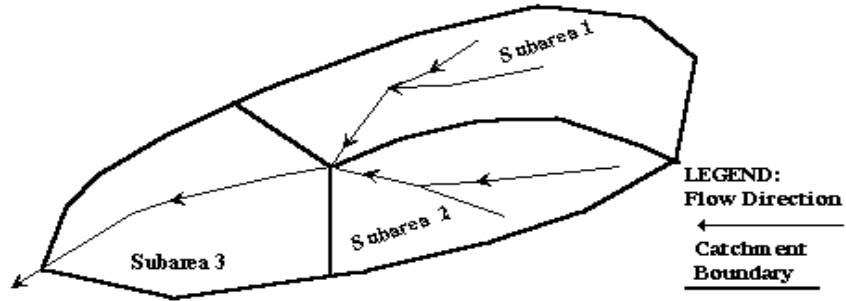
Designer: Gary E. Welp, PE, CFM

Company: RGA

Date: 8/13/2023

Project: Paintbrush Hills Well #12

Location: Peyton, CO



Subcatchment Name
Sub #1

Cells of this color are for required user-input
Cells of this color are for optional override values
Cells of this color are for calculated results based on overrides

See sheet "Design Info" for imperviousness-based runoff coefficient values.

Sub-Area ID	Area (ac)	NRCS Hydrologic Soil Group	Percent Imperviousness	Runoff Coefficient, C						
				2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	500-yr
landscape	0.07	B	2.0	0.01	0.01	0.07	0.26	0.34	0.44	0.54
					0.16				0.41	
gravel	0.00	B	80.0	0.64	0.67	0.70	0.75	0.77	0.80	0.83
					0.80				0.85	
building	0.01	B	90.0	0.74	0.76	0.78	0.81	0.83	0.84	0.87
					0.90				0.95	
residential	0.02	B	20.0	0.13	0.15	0.22	0.37	0.44	0.52	0.61
					0.26				0.48	
18										
Total Area (ac)	0.11			0.13	0.14	0.20	0.36	0.43	0.51	0.60
			Area-Weighted C	0.13	0.28	0.20	0.36	0.43	0.50	0.60
			Area-Weighted Override C							

Area-Weighted Runoff Coefficient Calculations

Version 2.00 released May 2017

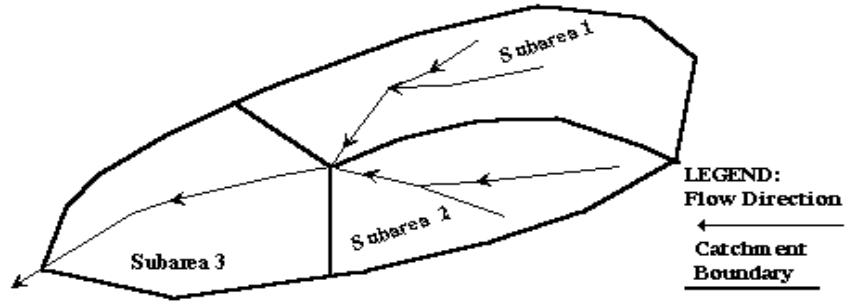
Designer: Gary E. Welp, PE, CFM

Company: RGA

Date: 8/13/2023

Project: Paintbrush Hills Well #12

Location: Peyton, CO



Subcatchment Name
Sub #2

Cells of this color are for required user-input
Cells of this color are for optional override values
Cells of this color are for calculated results based on overrides

See sheet "Design Info" for imperviousness-based runoff coefficient values.

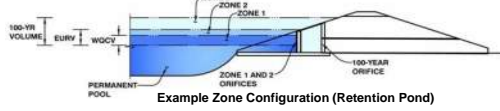
Sub-Area ID	Area (ac)	NRCS Hydrologic Soil Group	Percent Imperviousness	Runoff Coefficient, C							
				2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	500-yr	
landscape	0.15	B	2.0	0.01	0.01	0.07	0.26	0.34	0.44	0.54	
					0.16				0.41		
gravel	0.09	B	80.0	0.64	0.67	0.70	0.75	0.77	0.80	0.83	
					0.80				0.85		
building	0.00	B	90.0	0.74	0.76	0.78	0.81	0.83	0.84	0.87	
					0.90				0.95		
residential	0.22	B	20.0	0.13	0.15	0.22	0.37	0.44	0.52	0.61	
					0.26				0.48		
26											
Total Area (ac)	0.46			Area-Weighted C	0.19	0.21	0.26	0.41	0.47	0.55	0.63
				Area-Weighted Override C	0.19	0.33	0.26	0.41	0.47	0.53	0.63

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.06 (July 2022)

Project: **PBHMD Pump House #6**

Basin ID: **Detention Pond "C" with the addition of PBHMD Pump House #6**



Watershed Information

Selected BMP Type =	EDB
Watershed Area =	137.58 acres
Watershed Length =	3,440 ft
Watershed Length to Centroid =	2,149 ft
Watershed Slope =	0.025 ft/ft
Watershed Imperviousness =	32.85% percent
Percentage Hydrologic Soil Group A =	0.0% percent
Percentage Hydrologic Soil Group B =	100.0% percent
Percentage Hydrologic Soil Groups C/D =	0.0% percent
Target WQCV Drain Time =	40.0 hours
Location for 1-hr Rainfall Depths =	User Input

After providing required inputs above including 1-hour rainfall depths, click "Run CUHP" to generate runoff hydrographs using the embedded Colorado Urban Hydrograph Procedure.

Water Quality Capture Volume (WQCV) =	1.835	acre-feet
Excess Urban Runoff Volume (EURV) =	4.672	acre-feet
2-yr Runoff Volume (P1 = 1.19 in.) =	4.694	acre-feet
5-yr Runoff Volume (P1 = 1.5 in.) =	7.422	acre-feet
10-yr Runoff Volume (P1 = 1.75 in.) =	9.914	acre-feet
25-yr Runoff Volume (P1 = 2 in.) =	13.611	acre-feet
50-yr Runoff Volume (P1 = 2.25 in.) =	16.448	acre-feet
100-yr Runoff Volume (P1 = 2.52 in.) =	20.193	acre-feet
500-yr Runoff Volume (P1 = 3.14 in.) =	27.489	acre-feet
Approximate 2-yr Detention Volume =	3.374	acre-feet
Approximate 5-yr Detention Volume =	4.791	acre-feet
Approximate 10-yr Detention Volume =	6.853	acre-feet
Approximate 25-yr Detention Volume =	7.849	acre-feet
Approximate 50-yr Detention Volume =	8.261	acre-feet
Approximate 100-yr Detention Volume =	9.674	acre-feet

Optional User Overrides

		acre-feet
		acre-feet
	1.19	inches
	1.50	inches
	1.75	inches
	2.00	inches
	2.25	inches
	2.52	inches
		inches

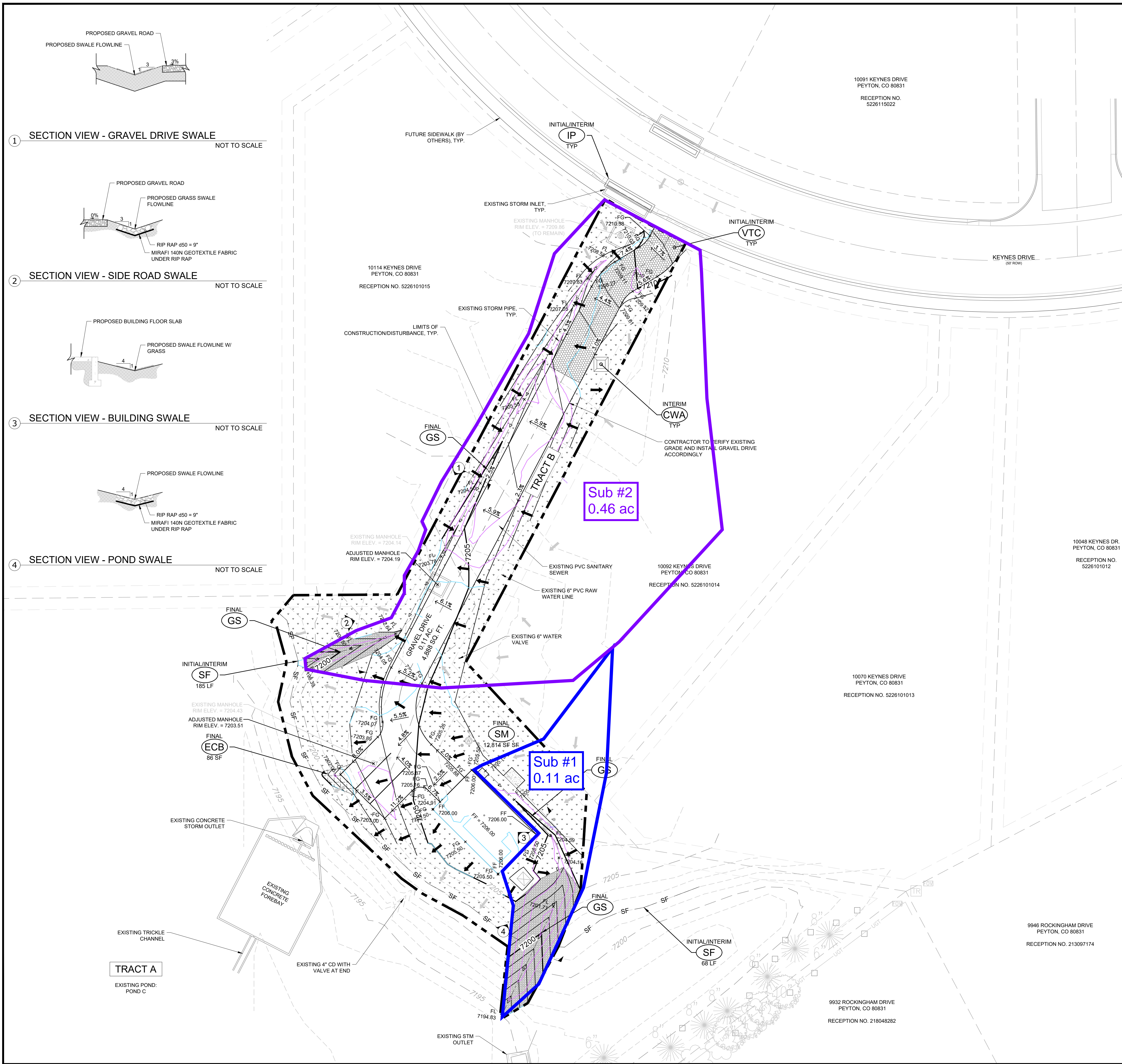
Define Zones and Basin Geometry

Select Zone 1 Storage Volume (Required) =		acre-feet
Select Zone 2 Storage Volume (Optional) =		acre-feet
Select Zone 3 Storage Volume (Optional) =		acre-feet
Total Detention Basin Volume =		acre-feet
Initial Surcharge Volume (ISV) =	user	ft ³
Initial Surcharge Depth (ISD) =	user	ft
Total Available Detention Depth (H _{total}) =	user	ft
Depth of Trickle Channel (H _{TC}) =	user	ft
Slope of Trickle Channel (S _{TC}) =	user	ft/ft
Slopes of Main Basin Sides (S _{main}) =	user	H:V
Basin Length-to-Width Ratio (R _{LW}) =	user	
Initial Surcharge Area (A _{ISV}) =	user	ft ²
Surcharge Volume Length (L _{ISV}) =	user	ft
Surcharge Volume Width (W _{ISV}) =	user	ft
Depth of Basin Floor (H _{FLOOR}) =	user	ft
Length of Basin Floor (L _{FLOOR}) =	user	ft
Width of Basin Floor (W _{FLOOR}) =	user	ft
Area of Basin Floor (A _{FLOOR}) =	user	ft ²
Volume of Basin Floor (V _{FLOOR}) =	user	ft ³
Depth of Main Basin (H _{MAIN}) =	user	ft
Length of Main Basin (L _{MAIN}) =	user	ft
Width of Main Basin (W _{MAIN}) =	user	ft
Area of Main Basin (A _{MAIN}) =	user	ft ²
Volume of Main Basin (V _{MAIN}) =	user	ft ³
Calculated Total Basin Volume (V _{total}) =	user	acre-feet

Depth Increment = ft

Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft ²)	Optional Override Area (ft ²)	Area (acre)	Volume (ft ³)	Volume (ac-ft)
Top of Micropool	--	0.00	--	--	--	180	0.004		
	--	0.91	--	--	--	457	0.010	290	0.007
	--	1.91	--	--	--	14,185	0.326	7,611	0.175
	--	2.91	--	--	--	41,901	0.962	35,654	0.818
	--	3.91	--	--	--	61,466	1.411	87,337	2.005
	--	4.91	--	--	--	72,754	1.670	154,447	3.546
	--	5.91	--	--	--	81,398	1.869	231,523	5.315
	--	6.91	--	--	--	86,246	1.980	315,345	7.239
	--	7.91	--	--	--	92,877	2.132	404,906	9.295
	--	8.91	--	--	--	98,536	2.262	500,613	11.492
	--	9.91	--	--	--	105,513	2.422	602,637	13.835

Saved: 8/4/2023 10:16 AM
 By: JSCHNEIDER
 Project: 8772023 10:16 AM
 Filename: S:\1070 - PAINT BRUSH HILLS METROPOLITAN DISTRICT\1070.0014 - WELL #1\2\SITE DEVELOPMENT PLAN\DWG\XX GRADING PLAN.DWG



1 SECTION VIEW - GRAVEL DRIVE SWALE
NOT TO SCALE

2 SECTION VIEW - SIDE ROAD SWALE
NOT TO SCALE

3 SECTION VIEW - BUILDING SWALE
NOT TO SCALE

4 SECTION VIEW - POND SWALE
NOT TO SCALE

LEGEND

	EXISTING PROPERTY LINE
	EXISTING WATER LINE
	EXISTING SANITARY SEWER LINE
	EXISTING SANITARY SEWER MANHOLE
	EXISTING STORM SEWER MANHOLE
	EXISTING WATER WELL
	EXISTING STORM PIPE
	EXISTING WATER VALVE
	EXISTING ELECTRIC MH
	EXISTING ELECTRIC MKR
	EXISTING ELECTRIC TRANSFORMER
	EXISTING ELECTRIC UNDERGROUND
	EXISTING FIBER OPTIC UNDERGROUND
	EXISTING CABLE TV UNDERGROUND
	EXISTING GAS LINE UNDERGROUND
	EXISTING CONT-MJR
	EXISTING CONT-MNR
	EXISTING SURFACE FLOW DIRECTION ARROW
	PROPOSED SURFACE FLOW DIRECTION ARROW
	PROPOSED SPOT ELEVATION
	PROPOSED CONT-MJR
	PROPOSED CONT-MNR
	PROPOSED PUMP HOUSE FOOTPRINT
	PROPOSED GRAVEL DRIVE
	PROPOSED RIP RAP
	PROPOSED CUT LINE
	PROPOSED FILL LINE
	PROPOSED SILT FENCE
	PROPOSED VEHICLE TRACKING CONTROL
	PROPOSED CONCRETE WASHOUT
	PROPOSED INLET PROTECTION
	PROPOSED SWALE
	PROPOSED EROSION CONTROL BLANKET
	PROPOSED SEEDING AND MULCHING
	PROPOSED STABILIZED STAGING AREA

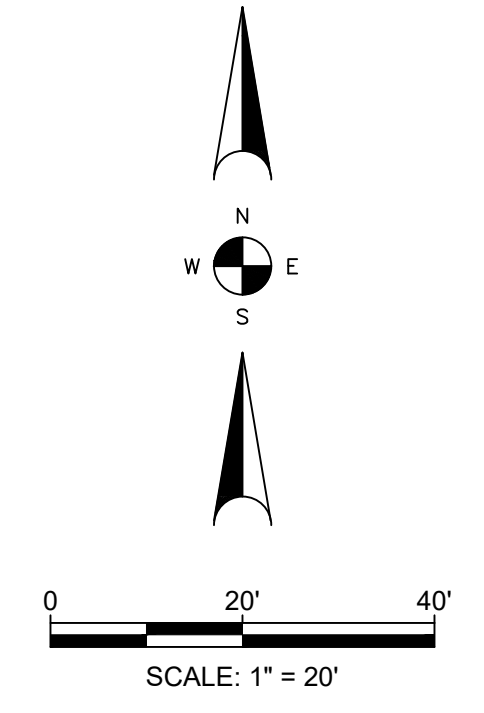
ABBREVIATIONS

FL	FLOW LINE
FF	FINISHED FLOOR
FG	FINISHED GRADE
HP	HIGH POINT

AREAS OF CUT/FILL

CUT = 371.4 CY
 FILL = 31.91 CY
 NET = (CUT) 339.5 CY

- ### NOTES:
- EXISTING SITE HAS NO NOTABLE VEGETATION OTHER THAN FIELD GRASS AND WEEDS.
 - SITE IS NOT LOCATED WITHIN THE FEMA 100-YEAR FLOODPLAIN.
 - CONTRACTOR TO INSTALL EROSION CONTROL BLANKET (ECB) ON SLOPES OF 3:1 OR GREATER.
 - LOCATION OF STABILIZED STAGING AREA (SSA) TO BE DETERMINED AT THE PRE-CONSTRUCTION MEETING.
 - AREAS OUTSIDE OF THE CONSTRUCTION SITE BOUNDARY SHALL BE PROTECTED WITH CONSTRUCTION FENCING OR OTHER METHODS AS APPROPRIATE.
 - THERE ARE NO DEDICATED ASPHALT/CONCRETE BATCH PLANTS ON SITE.



811 <small>48 HOURS BEFORE YOU DIG, CALL UTILITY NOTIFICATION CENTER OF COLORADO (UNCCO)</small>															
<small>GAS, ELECTRIC, TELEPHONE, CABLE, AND PANTHER EARTH PIPES LOCATIONS</small>															
SCALE VERIFICATION <small>BAR IS ONE INCH ON ORIGINAL DRAWING IF NOT ONE INCH ON THIS SHEET SCALE ACCORDINGLY</small>															
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RG AND ASSOCIATES, LLC <small>4885 Ward Road, Suite 100 • Wheat Ridge, CO 80033 Del Norte • Wheat Ridge 303-293-8107 • www.rgengineers.com</small>															
PUMP HOUSE SIX UTILITY BUILDING GRADING AND EROSION CONTROL PLAN <small>PAINT BRUSH HILLS METROPOLITAN DISTRICT 9885 TOWNER AVENUE PEYTON, CO 80831</small>															
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SHEET NO: 5 of 6															

Worksheet for Triangular Channel - Roadside grass

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth
Input Data	
Roughness Coefficient	0.027
Channel Slope	2.5 %
Left Side Slope	3.000 H:V
Right Side Slope	3.000 H:V
Discharge	2.20 cfs
Results	
Normal Depth	5.7 in
Flow Area	0.7 ft ²
Wetted Perimeter	3.0 ft
Hydraulic Radius	2.7 in
Top Width	2.86 ft
Critical Depth	6.1 in
Critical Slope	1.8 %
Velocity	3.23 ft/s
Velocity Head	0.16 ft
Specific Energy	0.64 ft
Froude Number	1.166
Flow Type	Supercritical
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0
GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	5.7 in
Critical Depth	6.1 in
Channel Slope	2.5 %
Critical Slope	1.8 %

Worksheet for Triangular Channel - Roadside riprap rundown

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth
Input Data	
Roughness Coefficient	0.040
Channel Slope	10.0 %
Left Side Slope	3.000 H:V
Right Side Slope	3.000 H:V
Discharge	2.20 cfs
Results	
Normal Depth	5.1 in
Flow Area	0.5 ft ²
Wetted Perimeter	2.7 ft
Hydraulic Radius	2.4 in
Top Width	2.56 ft
Critical Depth	6.1 in
Critical Slope	4.0 %
Velocity	4.04 ft/s
Velocity Head	0.25 ft
Specific Energy	0.68 ft
Froude Number	1.545
Flow Type	Supercritical
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0
GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	5.1 in
Critical Depth	6.1 in
Channel Slope	10.0 %
Critical Slope	4.0 %

Worksheet for Triangular Channel - Building grass

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth
Input Data	
Roughness Coefficient	0.027
Channel Slope	2.9 %
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Discharge	0.50 cfs
Results	
Normal Depth	2.8 in
Flow Area	0.2 ft ²
Wetted Perimeter	2.0 ft
Hydraulic Radius	1.4 in
Top Width	1.90 ft
Critical Depth	3.0 in
Critical Slope	2.2 %
Velocity	2.22 ft/s
Velocity Head	0.08 ft
Specific Energy	0.31 ft
Froude Number	1.136
Flow Type	Supercritical
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0
GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	2.8 in
Critical Depth	3.0 in
Channel Slope	2.9 %
Critical Slope	2.2 %

Worksheet for Triangular Channel - Building riprap rundown

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth
Input Data	
Roughness Coefficient	0.040
Channel Slope	25.0 %
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Discharge	0.50 cfs
Results	
Normal Depth	2.2 in
Flow Area	0.1 ft ²
Wetted Perimeter	1.5 ft
Hydraulic Radius	1.1 in
Top Width	1.47 ft
Critical Depth	3.0 in
Critical Slope	4.9 %
Velocity	3.71 ft/s
Velocity Head	0.21 ft
Specific Energy	0.40 ft
Froude Number	2.161
Flow Type	Supercritical
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0
GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	2.2 in
Critical Depth	3.0 in
Channel Slope	25.0 %
Critical Slope	4.9 %

PRELIMINARY/FINAL DRAINAGE REPORT

FOR **PAINT BRUSH HILLS FILING NO. 14**

EL PASO COUNTY, COLORADO

MARCH 2021

Prepared for:

The Landhuis Company
212 N. Wahsatch Ave, Suite 301
Colorado Springs, CO 80903
(719) 635-3200

Prepared by:



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Colorado Springs, CO 80903
(719) 955-5485

Project #10-014
PCD Project # SP206 & SF2024

**PRELIMINARY/FINAL DRAINAGE REPORT
FOR PAINT BRUSH HILLS FILING NO. 14**

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Hydraulic Calculations/EDB Calculations
Grading Erosion Control Plan
Reference Maps
Proposed and Existing Drainage Maps

Sewer plans but the flows (slightly higher) have been adjusted by this report the Preliminary/Final Drainage Report for Paint Brush Hills Filing No. 14” prepared by MS Civil Consultants, dated December 2020.

Detailed Drainage Discussion

Basins Tributary to Detention Pond C

Basin OS5C, 29.0 acres, ($Q_5=25.5$ cfs, $Q_{100}=57.0$ cfs), consist of existing developed 3.5-acre properties and streets. Runoff produced by the offsite area, are routed via existing roadside swales to a larger natural swale which carries flows south towards the north boundary of the subject site.

Basin A, 3.82 acres, ($Q_5=2.9$ cfs, $Q_{100}=10.7$ cfs), consists of a proposed single family residential lots and proposed 25’ wide trail easement/Tract A. Developed flows within **Basin A** and offsite **Basin OS5C** are routed as surface runoff via an existing swale, in a 75’ drainage easement, to **DP3** ($Q_5=27.7$ cfs, $Q_{100}=65.3$ cfs). Surface runoff at **DP3** will be collected and conveyed via a 36” RCP FES and 36” RCP pipe (**PR2**) to **DP4**. The existing swale shall be natural, except for the lower portion where it will be graded to the 36” RCP FES. This portion of the swale shall be maintained by the Paint Brush Hills Metropolitan District (see SC 150 Turf Reinforcement Mat in appendix). In the event of clogging, flows at **DP3** will over top the embankment and shall be conveyed via curb and gutter to **DP4**.

Basin J, 3.9 acres, ($Q_5=3.0$ cfs, $Q_{100}=10.4$ cfs), consists of proposed single family residential lots and proposed local residential streets. Surface runoff is routed via curb and gutter to **DP4** which will be collected by a proposed 10’ Type R sump inlet. The intercepted flow ($Q_5=3.0$ cfs, $Q_{100}=10.4$ cfs) will be routed west via an 18” RCP pipe (**PR3**, $Q_5=3.0$ cfs, $Q_{100}=10.4$ cfs) to **PR5** ($Q_5=31.0$ cfs, $Q_{100}=75.9$ cfs), a 48” RCP. In the event of clogging, flows at **DP4** will over top the high point and be routed via curb and gutter to **DP10**.

Basin K, 0.8 acres, ($Q_5=1.1$ cfs, $Q_{100}=2.7$ cfs), consists of proposed single family residential lots and proposed local residential streets. Surface runoff is routed via curb and gutter to **DP5** which will be collected by a proposed 5’ Type R sump inlet. The intercepted flow ($Q_5=1.1$ cfs, $Q_{100}=2.7$ cfs) will be routed west via an 18” RCP pipe (**PR4**, $Q_5=1.1$ cfs, $Q_{100}=2.7$ cfs) to **PR5** ($Q_5=31.0$ cfs, $Q_{100}=75.5$ cfs), a 48” RCP. In the event of clogging, flows at **DP5** will over top the high point and be routed via curb and gutter to **DP10**.

Basin OS5B, 13.4 acres, ($Q_5=4.6$ cfs, $Q_{100}=25.8$ cfs), consist of existing developed 3.5-acre properties and streets. Runoff produced by the offsite area, will sheet flow into **Basin D**.

Basin D, 5.2 acres, ($Q_5=3.8$ cfs, $Q_{100}=14.0$ cfs), consists of a proposed single family residential lots. Cumulative developed flows within **Basin D** and offsite **Basin OS5B** are routed via curb and gutter and side lot swales to **DP6**.

Basin E, 0.5 acres, ($Q_5=2.3$ cfs, $Q_{100}=4.1$ cfs), consists of a proposed local residential street. Surface runoff from **Basin E** will combine with flows from **Basin OS5B** and **Basin D** and will be routed via curb and gutter to **DP6** which will be collected by a proposed 15’ Type R sump inlet. The cumulative flow from **DP6** and **DP7** at **DP8** is $Q_5=10.7$ cfs, $Q_{100}=44.4$. The 100-year flow will be split between the two inlets. The intercepted flow at **DP6** ($Q_5=9.3$ cfs, $Q_{100}=22.2$) will be routed west via a 24” RCP pipe (**PR7**, $Q_5=9.2$ cfs, $Q_{100}=22.2$ cfs) to **PR9**. In the event of clogging, flows at **DP6** will over top the high point in Country Manor Drive and be routed to **DP12**.

Basin F, 1.6 acres, ($Q_5=1.9$ cfs, $Q_{100}=5.4$ cfs), consists of proposed single family residential lots and proposed local residential streets. Surface runoff is routed via curb and gutter to **DP7** which will be

Basin M, 2.53 acres, ($Q_5=2.6$ cfs, $Q_{100}=7.8$ cfs), consists of proposed single family residential lots and proposed local residential streets. Flowby from **DP9**, **DP11**, **DP12** and surface runoff from **Basin M** will be routed via curb and gutter to **DP13** ($Q_5=2.1$ cfs, $Q_{100}=21.3$ cfs). See **Basin C** for discussion of intercepted flow.

Basin OS5A, 3.7 acres, ($Q_5=1.5$ cfs, $Q_{100}=8.4$ cfs), consist of existing developed 3.5-acre properties and streets. Runoff produced by the offsite area, will sheet flow onto **Basin C** which will be routed via side lot swales and curb and gutter to **DP14**.

Basin C, 11.8 acres, ($Q_5=9.2$ cfs, $Q_{100}=28.6$ cfs), consists of proposed single family residential lots and proposed local residential streets. Surface runoff is routed via curb and gutter to **DP14** ($Q_5=10.3$ cfs, $Q_{100}=34.8$ cfs). The combined flows from **DP13** and **DP14** will be captured by proposed dual 20' Type R sump inlets at **DP15** ($Q_5=12.3$ cfs, $Q_{100}=55.4$ cfs). The intercepted flow will be routed south via a 30" RCP pipe (**PR22**, $Q_5=6.1$ cfs, $Q_{100}=27.7$ cfs per side) and then south to a proposed 36" RCP pipe (**PR23**, $Q_5=12.3$ cfs, $Q_{100}=55.4$ cfs). The combined flows from **PR21** and **PR23** will be routed south to a proposed 60" RCP pipe (**PR24**, $Q_5=98.8$ cfs, $Q_{100}=269.2$ cfs) which will ultimately outfall into a proposed concrete lined forebay in Pond C.

Basin B, 8.31 acres, ($Q_5=5.6$ cfs, $Q_{100}=20.8$ cfs), consists of the backyards of proposed single family residential lots. Minimal improvements to the backyards will be implemented and shall have split rail fences only along the rear and side lots lines. Surface runoff will be collected by a 2' wide swale (see Table 10-4 in appendix), within a 20'/30' easement, to **DP16** a CDOT type C inlet. The intercepted flow will be routed east via a 30" RCP pipe (**PR25**, $Q_5=5.6$ cfs, $Q_{100}=20.8$ cfs). The cumulative flows from **PR24** and **PR25** will combine and be routed south to a proposed 66" RCP pipe (**PR26**, $Q_5=103.6$ cfs, $Q_{100}=287.2$ cfs) which will outfall into a proposed concrete lined forebay in Pond C.

Basin N, 8.94 acres, ($Q_5=6.2$ cfs, $Q_{100}=23.0$ cfs), consists of backyards of proposed single family residential lots, backyards of existing residential lots from Paint Brush Hills Filing No. 12 and existing Pond C. The combined surface runoff and **PR26** will be collected at **DP17** (existing **Pond C**, $Q_5=108.8$ cfs, $Q_{100}=306.5$ cfs). The existing **Pond C** will require modifications in order to function as an Full Spectrum Extended Detention Basin (EDB). These modifications will be addressed in the Street and Storm Sewer Construction drawings for Paint Brush Hills Filing No. 14. The proposed Detention **Pond C** functions to provide full spectrum detention and water quality for runoff calculated onsite and offsite flows. The pond is designed to treat approx 137.6 acres, and provide 1.839 ac-ft of WQCV storage, 4.673 ac-ft of EURV and 11.583 ac-ft of 100-year storage. The forebay, trickle channel micropool, outlet structure and pipe have been designed per the UDFCD manual using the MHFD Detention v4.03 workbook. The detention pond will be private and shall be maintained by the Paint Brush Hills Metropolitan District. Access shall be granted to the owner and El Paso County for maintenance of the private detention pond. A private maintenance agreement document shall accompany the submittal. In the event of clogging of the outlet structure, flows at **DP17** will over top the emergency spillway and outfall onto an existing swale, as it previously was designed. Per the Paint Brush Hills Filing No. 12 Construction Plans, an existing 20' x 20' rip rap pad ($D_{50} = 18"$) has been constructed and is in general conformance with the present release rate. The existing riprap pad will dissipate energy and prevent local scour at the outlet. The peak release rate from **Pond C** (**#PR27**, $Q_5=22.6$ cfs and $Q_{100}=92.8$ cfs ~an existing 48" RCP) outfalls into an existing swale. The flows exiting the site are less than the flows as stated in the MDDP of $Q_5=22$ cfs and $Q_{100}=161$ cfs. The proposed discharge from the subject site will not adversely affect the downstream infrastructure or affect water quality.

Basin Tributary to Adjacent Property to the West

Basin B1, 0.92 acres, ($Q_5=0.6$ cfs, $Q_{100}=2.4$ cfs), consists of portions of two backyards of proposed single family residential lots which will have minimal to no impervious surfaces and an upstream natural swale.

APPENDIX

HYDROLOGIC CALCULATIONS

***PAINTRUSH HILLS FILING NO. 14
FINAL DRAINAGE CALCULATIONS
(Area Runoff Coefficient Summary)***

BASIN	TOTAL AREA (Sq Ft)	TOTAL AREA (Acres)	IMPERVIOUS AREA/STREET			LANDSCAPED/UNDEVELOPED			RESIDENTIAL			WEIGHTED	
			AREA (Acres)	C ₅	C ₁₀₀	AREA (Acres)	C ₅	C ₁₀₀	AREA (Acres)	C ₅	C ₁₀₀	C ₅	C ₁₀₀
**RR	182952	4.20	0.00	0.90	0.96	0.00	0.16	0.41	4.20	0.30	0.50	0.30	0.50
**SS	131167	3.01	0.00	0.90	0.96	0.00	0.16	0.41	3.01	0.30	0.50	0.30	0.50
**OSI	193584	4.44	0.00	0.90	0.96	0.00	0.16	0.41	4.44	0.30	0.50	0.30	0.50
*OO	1268037	29.11	0.00	0.90	0.96	29.11	0.16	0.41	0.00	0.22	0.46	0.16	0.41
*TT	219978	5.05	0.00	0.90	0.96	0.00	0.16	0.41	5.05	0.35	0.45	0.35	0.45
*UU	55321	1.27	0.00	0.90	0.96	0.00	0.16	0.41	1.27	0.35	0.45	0.35	0.45
***OS-5	2008124	46.10	0.00	0.90	0.96	0.00	0.16	0.41	46.10	0.30	0.40	0.30	0.40
OS5A	159430	3.66	0.00	0.90	0.96	0.00	0.16	0.41	3.66	0.11	0.37	0.11	0.37
OS5B	585306	13.44	0.00	0.90	0.96	0.00	0.16	0.41	13.44	0.11	0.37	0.11	0.37
OS5C	1263404	29.00	0.00	0.90	0.96	0.00	0.16	0.41	29.00	0.30	0.40	0.30	0.40
A	166371	3.82	0.00	0.90	0.96	0.00	0.16	0.41	3.82	0.20	0.44	0.20	0.44
B	361915	8.31	0.00	0.90	0.96	0.00	0.16	0.41	8.31	0.20	0.44	0.20	0.44
BI	40214	0.92	0.00	0.90	0.96	0.00	0.16	0.41	0.92	0.16	0.41	0.16	0.41
C	514010	11.80	0.00	0.90	0.96	0.00	0.16	0.41	11.80	0.26	0.48	0.26	0.48
D	226401	5.20	0.00	0.90	0.96	0.00	0.16	0.41	5.20	0.20	0.44	0.20	0.44
E	21364	0.49	0.49	0.90	0.96	0.00	0.16	0.41	0.00	0.20	0.44	0.90	0.96
F	70330	1.61	0.00	0.90	0.96	0.00	0.16	0.41	1.61	0.30	0.50	0.30	0.50
G	531342	12.20	0.00	0.90	0.96	0.00	0.16	0.41	12.20	0.35	0.52	0.35	0.52
H	469586	10.78	0.00	0.90	0.96	0.00	0.16	0.41	10.78	0.35	0.52	0.35	0.52
I	554956	12.74	0.00	0.90	0.96	0.00	0.16	0.41	12.74	0.35	0.52	0.35	0.52
J	169859	3.90	0.00	0.90	0.96	0.00	0.16	0.41	3.90	0.22	0.45	0.22	0.45
K	32632	0.75	0.00	0.90	0.96	0.00	0.16	0.41	0.75	0.36	0.54	0.36	0.54
L	146850	3.37	0.00	0.90	0.96	0.00	0.16	0.41	3.37	0.36	0.54	0.36	0.54
M	110207	2.53	0.00	0.90	0.96	0.00	0.16	0.41	2.53	0.27	0.48	0.27	0.48
N	389341	8.94	0.00	0.90	0.96	3.19	0.16	0.41	5.75	0.22	0.46	0.20	0.44

* Values taken from "Final Drainage Report for Paint Brush Hills Filing 13E" (*FDRPBH-13E) prepared by Classic Consulting Engineers and Surveyors, dated Sept 2018

** Revised from "Final Drainage Report for Paint Brush Hills Filing 13E" (**PDRPBH13E) prepared by Classic Consulting Engineers and Surveyors, dated Sept 2018

*** "Final Drainage Report for Paint Brush Hills-Phase 2 (Filing 13)" (FDRPBH-PH2-13) prepared by Classic Consulting Engineers and Surveyors, revised June 2008

Calculated by: GT

Date: 3/12/2021

Checked by: VAS

**PAINTBRUSH HILLS FILING NO. 14
FINAL DRAINAGE CALCULATIONS
(Area Drainage Summary)**

From Area Runoff Coefficient Summary				OVERLAND				STREET / CHANNEL FLOW				Time of Travel		INTENSITY *		TOTAL FLOWS		
BASIN	AREA TOTAL (Acres)	C ₅	C ₁₀₀	C ₅	Length (ft)	Height (ft)	T _c (min)	Length (ft)	Slope (%)	Velocity (fps)	T _i (min)	TOTAL (min)	CHECK (min)	I ₅ (in/hr)	I ₁₀₀ (in/hr)	Q ₅ (c.f.s.)	Q ₁₀₀ (c.f.s.)	
Proposed Area Drainage Summary																		
**RR	4.20	0.30	0.50	0.25													8.0	17.0
**SS	3.01	0.30	0.50	0.25	170	3.4	16.5	800	3.9%	6.9	1.9	18.4	15.4	3.1	5.6	2.8	8.4	
**OS1	4.44	0.30	0.50	0.30	100	5	8.5	616	1.0%	2.0	5.1	13.6	14.0	3.7	6.2	4.9	13.7	
*OO	29.11	0.16	0.41	0.16													22.0	51.0
*TT	5.05	0.35	0.45	0.25	180	3.6	17.0	150	1.5%	4.3	0.6	17.6	11.8	3.2	5.7	5.7	13.0	
*UU	1.27	0.35	0.45	0.25	180	3.6	17.0	475	2.5%	5.5	1.4	18.4	13.6	3.1	5.6	1.4	3.2	
***OS-5	46.10	0.30	0.40	0.30													14.0	32.0
OSSA	3.66	0.11	0.37	0.11	100	2	14.2	527	1.5%	1.8	4.8	19.0	13.5	3.7	6.2	1.5	8.4	
OSSB	13.44	0.11	0.37	0.11	100	2	14.2	1684	1.5%	1.8	15.3	29.5	19.9	3.1	5.2	4.6	25.8	
OSSC	29.00	0.30	0.40	0.30	100	2	11.5	2110	1.0%	2.0	17.6	29.1	22.3	2.9	4.9	25.5	57.0	
A	3.82	0.20	0.44	0.20	100	4	10.3	373	3.2%	2.7	2.3	12.6	12.6	3.8	6.3	2.9	10.7	
B	8.31	0.20	0.44	0.20	100	3	11.3	1063	3.2%	2.7	6.6	17.9	16.5	3.4	5.7	5.6	20.8	
BI	0.92	0.16	0.41	0.16	100	3	11.8	265	2.6%	3.2	1.4	13.2	12.0	3.9	6.5	0.6	2.4	
C	11.80	0.26	0.48	0.26	100	3	10.6	2030	2.6%	3.2	10.6	21.1	21.8	3.0	5.0	9.2	28.6	
D	5.20	0.20	0.44	0.20	100	4	10.3	593	2.0%	2.1	4.7	14.9	13.9	3.6	6.1	3.8	14.0	
E	0.49	0.90	0.96	0.90	10	0.2	0.9	471	2.0%	2.8	2.8	5.0	12.7	5.2	8.7	2.3	4.1	
F	1.61	0.30	0.50	0.30	60	1.2	8.9	362	2.0%	2.8	2.1	11.0	12.3	4.0	6.7	1.9	5.4	
G	12.20	0.35	0.52	0.35	100	2	10.8	1381	2.8%	3.3	6.9	17.7	18.2	3.3	5.5	14.0	34.8	
H	10.78	0.35	0.52	0.35	100	2	10.8	1543	2.1%	2.9	8.9	19.6	19.1	3.2	5.3	11.9	29.7	
I	12.70	0.35	0.52	0.35	100	2	10.8	1309	2.1%	2.9	7.5	18.3	17.8	3.3	5.5	14.5	36.2	
J	3.90	0.22	0.45	0.22	100	2	12.6	799	1.9%	2.7	4.9	17.5	15.0	3.5	5.9	3.0	10.4	
K	0.75	0.36	0.54	0.36	72	1.4	9.1	277	1.6%	2.5	1.8	10.9	11.9	4.0	6.7	1.1	2.7	
L	3.37	0.36	0.54	0.36	75	1.5	9.2	1802	2.1%	2.9	10.4	19.6	20.4	3.1	5.2	3.8	9.5	
M	2.53	0.27	0.48	0.27	100	2	11.9	318	2.1%	2.9	1.8	13.8	12.3	3.8	6.4	2.6	7.8	
N	8.94	0.20	0.44	0.20	100	2	12.9	902	3.2%	3.6	4.2	17.1	15.6	3.5	5.8	6.2	23.0	

*Values taken from "Final Drainage Report for Paint Brush Hills Filing 13E" (*FDRPBH13E) prepared by Classic Consulting Engineers and Surveyors, dated Sept 2018

** Revised from "Final Drainage Report for Paint Brush Hills Filing 13E" (**PDRPBH13E) prepared by Classic Consulting Engineers and Surveyors, dated Sept 2018

*** "Final Drainage Report for Paint Brush Hills-Phase 2 (Filing 13)" (FDRPBH-PH2-13) prepared by Classic Consulting Engineers and Surveyors, revised June 2008

Calculated by: GT

Date: 3/12/2021

ked by: VAS

HYDRAULIC CALCULATIONS / EDB WQCV CALCULATIONS

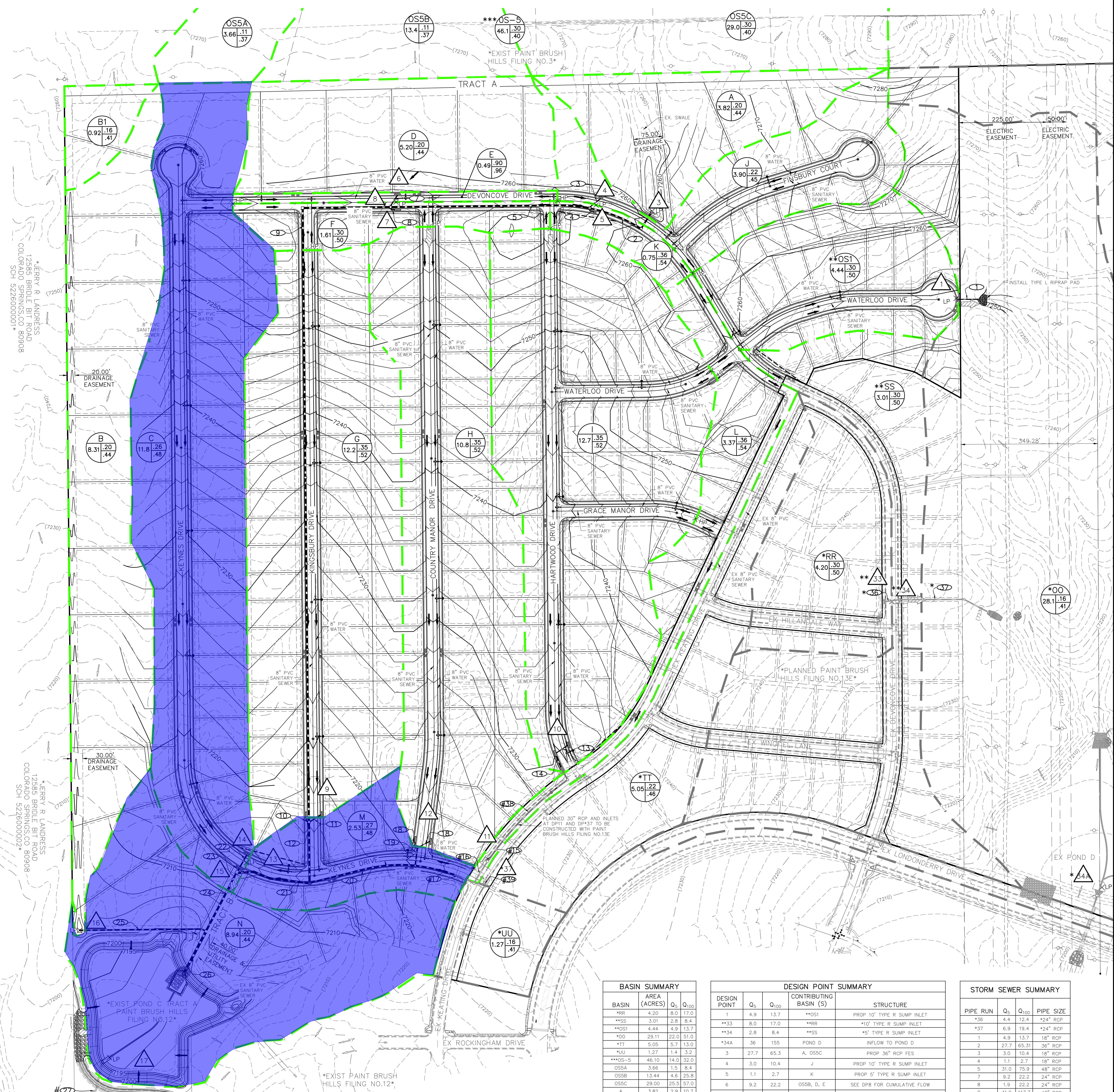
<i>Weighted Percent Imperviousness of WQ Pond C</i>				
<i>Contributing Basins</i>	<i>Area (Acres)</i>	<i>C_s</i>	<i>Impervious % (I)</i>	<i>(Acres)*(I)</i>
<i>OS5A</i>	3.66	0.11	5	18.30
<i>OS5B</i>	13.44	0.11	5	67.18
<i>OS5C</i>	29.00	0.30	40	1160.15
<i>A</i>	0.52	0.18	16	8.37
<i>B</i>	8.31	0.20	20	166.17
<i>C</i>	11.80	0.26	32	377.60
<i>D</i>	5.20	0.20	20	103.95
<i>E</i>	0.49	0.90	100	49.04
<i>F</i>	1.61	0.30	40	64.58
<i>G</i>	12.20	0.35	48	585.50
<i>H</i>	10.78	0.35	48	517.45
<i>I</i>	12.74	0.35	48	611.52
<i>J</i>	7.19	0.22	25	179.81
<i>K</i>	0.75	0.36	50	37.46
<i>L</i>	3.37	0.36	50	168.56
<i>M</i>	2.53	0.27	34	86.02
<i>N</i>	8.94	0.20	20	178.76
<i>*TT</i>	5.05	0.35	25	126.25
<i>Totals</i>	137.58			4506.69
<i>Imperviousness of WQ Pond C</i>	32.8			

PAINT BRUSH HILLS FILING NO. 14

COUNTY OF EL PASO, STATE OF COLORADO

PROPOSED DRAINAGE MAP

MARCH 2021



POND C EDB SUMMARY
EPC/URBAN DRAINAGE EDB

WO WATER SURFACE ELEV	7193.88
WO VOLUME	1.839 AC-FT
EURY WATER SURFACE ELEV	7195.65
EURY VOLUME	4.673 AC-FT
100-YR WATER SURFACE ELEV	7199.00
100-YR VOLUME	11.583 AC-FT
SPILLWAY CREST ELEV	7199.00
TOP OF EMBANKMENT ELEV	7201.00
100-YR INFLOW	248.0 CFS
100-YR RELEASE	92.8 CFS

BASIN SUMMARY

BASIN	AREA (ACRES)	Q _s	Q ₁₀₀
**RR	4.20	8.0	17.0
**SS	3.01	2.8	8.4
**OS1	4.44	4.9	13.7
**00	29.11	22.0	57.0
**TT	5.05	5.7	13.0
**UU	1.27	1.4	3.2
**OS-5	46.10	14.0	32.0
OSSA	3.66	1.5	8.4
OSSB	13.44	4.6	25.8
OSSC	29.00	25.5	57.0
A	3.82	2.9	10.7
B	8.31	3.8	20.8
B1	0.92	0.6	2.4
C	11.80	9.2	28.6
D	5.20	3.8	14.0
E	0.49	2.3	4.1
F	1.61	1.9	5.4
G	12.20	14.0	34.8
H	10.78	11.9	29.7
I	12.70	14.8	36.2
J	3.90	3.0	10.4
K	0.75	1.1	2.7
L	3.37	3.8	9.5
M	2.53	2.6	7.8
N	8.94	6.2	23.0

DESIGN POINT SUMMARY

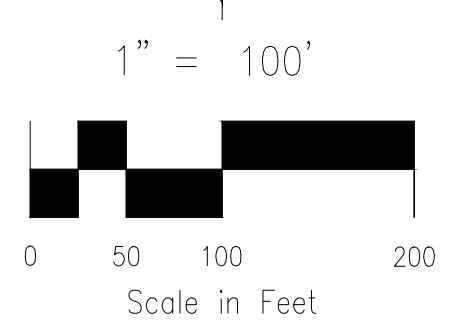
DESIGN POINT	Q _s	Q ₁₀₀	CONTRIBUTING BASIN (S)	STRUCTURE
1	4.9	13.7	**OS1	PROP 10" TYPE R SUMP INLET
**33	8.0	17.0	**RR	*10" TYPE R SUMP INLET
**34	2.8	8.4	**SS	*5" TYPE R SUMP INLET
**34A	36	155	POND D	INFLOW TO POND D
3	27.7	65.3	A, OSSC	PROP 36" RCP FES
4	3.0	10.4	J	PROP 10" TYPE R SUMP INLET
5	1.1	2.7	K	PROP 5" TYPE R SUMP INLET
6	9.2	22.2	OSSB, D, E	SEE DPB FOR CUMULATIVE FLOW
7	1.9	22.2	F	SEE DPB FOR CUMULATIVE FLOW
8	10.7	44.4	DP6, DP7	PROP DUAL 15" TYPE R SUMP INLET
9	13.8	34.4	G	PROP DUAL 15" TYPE R AT-GRADE INLET
10	14.5	36.2	I	PROP DUAL 15" TYPE R AT-GRADE INLET
11	3.7	17.0	L, FLOWBY DP10	EX 15" TYPE R AT-GRADE INLET
**37	5.7	13.0	**TT	EX 15" TYPE R AT-GRADE INLET
12	11.9	29.7	H	PROP DUAL 15" TYPE R AT-GRADE INLET
13	2.1	21.3	M, FLOWBY DP9, FLOWBY DP12, FLOWBY DP11	SEE DP15 FOR CUMULATIVE FLOW
14	10.3	34.8	C, OSSA	SEE DP15 FOR CUMULATIVE FLOW
15	12.3	55.4	DP13, DP14	PROP DUAL 20" TYPE R SUMP INLET
16	5.6	20.8	B	PROP CDOT TYPE C INLET
17	108.8	306.5	N, PR26	EX POND C

STORM SEWER SUMMARY

PIPE RUN	Q _s	Q ₁₀₀	PIPE SIZE
**36	4.4	12.4	*24" RCP
**37	6.9	19.4	*24" RCP
1	4.9	13.7	18" RCP
2	27.7	65.3	36" RCP
3	3.0	10.4	18" RCP
4	1.1	2.7	18" RCP
5	31.0	75.9	48" RCP
7	9.2	22.2	24" RCP
8	1.9	22.2	24" RCP
9	41.0	117.7	48" RCP
10	7.0	13.7	24" RCP
11	7.0	13.7	24" RCP
12	53.7	142.4	48" RCP
13	7.3	14.0	18" RCP
14	14.6	27.9	30" RCP
**38	14.6	27.9	*30" RCP
**15	3.7	13.5	*24" RCP
**16	17.4	39.7	*30" RCP
**39	5.7	13.0	*24" RCP
**17	22.8	51.3	*36" RCP
18	6.0	12.4	18" RCP
18.1	6.0	12.4	18" RCP
19	11.9	24.8	30" RCP
20	34.4	75.3	42" RCP
21	86.6	214.4	54" RCP
22	6.1	27.7	30" RCP
23	12.3	55.4	36" RCP
24	98.8	269.2	60" RCP
25	5.6	20.8	30" RCP
26	103.6	287.2	66" RCP
**27	22.6	92.8	EX 48" RCP

LEGEND

- BASIN DESIGNATION**
Z 25.25.36 C5
ACRES C100
- PIPE RUN REFERENCE LABEL
6
- SURFACE DESIGN POINT
- BASIN BOUNDARY
- CCES BASIN BOUNDARY
- EXISTING CONTOUR (6920)
- PROP CONTOUR (6920)
- PROP FENCE
- EX STORM SEWER PIPE
- STORM SEWER PIPE
- FLARED END SECTION
- CROSSSPAN
- INLET/OUTLET STRUCTURE
- EXISTING FLOW DIRECTION ARROW
- EMERGENCY OVERFLOW DIRECTION
- PROPOSED FLOW DIRECTION
- HIGH POINT (H.P.)
- LOW POINT (L.P.)
- RIPRAP
- EROSION CONTROL BLANKET



*VALUES TAKEN FROM "FINAL DRAINAGE REPORT FOR PAINT BRUSH HILLS FILING NO.13E" PREPARED BY CLASSIC ENGINEERS AND SURVEYORS, DATED SEPTEMBER, 2018. SEE PAINT BRUSH HILLS FILING NO.13E DRAINAGE MAP BASINS DD1, DD2, EE, FF, GG, HH, II, JJ AND KK FOR AREA DRAINAGE SUMMARY, BASIN ROUTING SUMMARY AND STORM SEWER ROUTING SUMMARY.
 **REVISED FROM "FINAL DRAINAGE REPORT FOR PAINT BRUSH HILLS FILING NO.13E" PREPARED BY CLASSIC ENGINEERS AND SURVEYORS, DATED SEPTEMBER 2018
 ***FINAL DRAINAGE REPORT FOR PAINT BRUSH HILLS PHASE 2 (FILING NO.13) PREPARED BY CLASSIC ENGINEERS AND SURVEYORS, REVISED JUNE 2008
 #REVISED FLOWS AND/OR PIPE SIZE FROM "FINAL DRAINAGE REPORT FOR PAINT BRUSH HILLS FILING NO.14" PREPARED BY MS CIVIL CONSULTANTS, DATED DECEMBER, 2020

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 PHONE: 719.955.5485

PAINT BRUSH HILLS FILING NO. 14
 PROPOSED DRAINAGE MAP
 PROJECT NO. 10-014
 SCALE: HORIZONTAL: 1"=100'
 DATE: 03/12/2021
 DESIGNED BY: GT
 DRAWN BY: CMN
 CHECKED BY: VAS
 SHEET 1 OF 1
 FDM



**FINAL DRAINAGE REPORT
FOR
PAINT BRUSH HILLS – PHASE 2
(FILING NO. 13)**

**OCTOBER 2005
REVISED MARCH 2006
REVISED JULY 2006
REVISED JUNE 2008**

PREPARED FOR:

**SIX NINETY-NINE PROPERTIES, LLC.
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PREPARED BY:

**CLASSIC CONSULTING ENGINEERS & SURVEYORS, LLC
6385 CORPORATE DRIVE, SUITE 101
COLORADO SPRINGS, CO 80919
(719) 785-0790**

2053.21

RECEIVED

JUL 17 2008

EPC DEVELOPMENT SERVICES

FOR REVIEW PURPOSES ONLY

JUL 11 2008



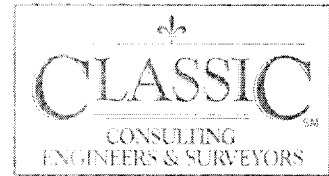
**FINAL DRAINAGE REPORT
FOR PAINT BRUSH HILLS – PHASE 2 (FILING NO. 13)**

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PURPOSE	Page 1
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APPENDICES

VICINITY MAP
F.E.M.A. MAP
FINAL PLAT APPROVAL / EXTENSION LETTERS
HYDROLOGIC / HYDRAULIC CALCULATIONS
CHANNEL / DROP STRUCTURE CALCULATIONS
RIP-RAP CALCULATIONS
DRAINAGE MAP



Design Point 32 ($Q_5 = 4$ cfs and $Q_{100} = 7$ cfs) consists of developed flows from Basin NN. An existing 6' sump inlet exists at this location. Based on the previous study, this location was notated as design point 18A with a developed flow of ($Q_5 = 8$ cfs and $Q_{100} = 15$ cfs). Thus, the existing facility at this location continues to adequately handle both the 5-year and 100-year developed flows.

Design Point 34A ($Q_5 = 46$ cfs and $Q_{100} = 106$ cfs) consists of developed flows from Basins DD1, DD2, EE, OO, RR and SS. Existing dual 36" RCP storm sewers exist at this location. Based on the previous study, this location was notated as Basin OS-9 with a developed flow of ($Q_5 = 50$ cfs and $Q_{100} = 113$ cfs). Thus, the existing facilities at this location continue to adequately handle both the 5-year and 100-year developed flows.

Design Point 34B ($Q_5 = 139$ cfs and $Q_{100} = 302$ cfs) consists of developed flows from much of the inner development. At this location, dual 42" RCP culverts are designed to handle both the 5-yr. and 100-yr. developed flows and route them safely under the proposed roadway and into the existing Detention Pond B1 based on the final overlot grading plan.

Design Point 34C ($Q_5 = 154$ cfs and $Q_{100} = 337$ cfs) consists of developed flows from the main natural channel. The existing Detention Pond B1 exists at this location. Based on the previous study, the total developed inflow to this facility was ($Q_5 = 149$ cfs and $Q_{100} = 326$ cfs). This increase equates to around 3% of what was previously accounted for at this design point. Thus, the existing detention facility at this location continues to adequately handle both the 5-yr. and 100-yr. developed flows.

Design Point 34D ($Q_5 = 89$ cfs and $Q_{100} = 207$ cfs) consists of developed flows from the off-site basins to the north and the north west corner of the development. The existing Detention Pond C exists at this location. Based on the previous study, the total developed inflow to this facility was ($Q_5 = 90$ cfs and $Q_{100} = 206$ cfs). Thus, the existing detention facility at this location continues to adequately handle both the 5-yr. and 100-yr. developed flows.

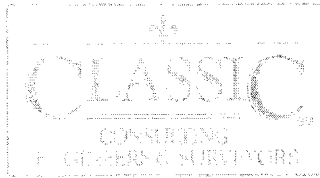


developed flows, respectfully. These collected flows are then combined with the collected flows mentioned earlier within the 42" RCP storm sewer. Approaching this sump location, the street design grade is 1.5%, which equates to a street capacity of 12.92 cfs per side. (See Appendix for Street Capacity Calculations) Incidentally, the total flows at Design Point 43 flow from both directions into the sump condition. Thus, the maximum flow from one direction would be from Basin WW2 ($Q_5 = 13$ cfs and $Q_{100} = 30$ cfs), which meets the County criteria for street capacity. The maximum ponding at this location will be 1.0' and then the flows will overtop the highpoint at the intersection and travel around the corner. These combined flows within the 42" RCP storm sewer will then combine with the collected flows from Design Points 42, 43 and 44. A 54" RCP storm sewer will convey these total flows in a westerly direction towards Design Point 45.

Basins XX1 and XX2 are tributary to the sump condition at Design Points 45 ($Q_5 = 7$ cfs and $Q_{100} = 16$ cfs) and 46 ($Q_5 = 11$ cfs and $Q_{100} = 26$ cfs). At these locations a 6' Type R sump inlet and a 10' Type R sump inlet will be installed to collect both the 5-year and 100-year developed flows. These collected flows are then combined with the flows from the previous design points and a 54" RCP will then convey the total developed flows in a southerly direction through a drainage tract directly into the existing detention pond. A rip-rap dissipater will be installed to minimize erosion. The emergency overflow route at this location is via a natural swale within the tract and then directly into the existing pond. As mentioned earlier, the total developed flows entering this existing facility is consistent with the previously approved Final Drainage Report for Paint Brush Hills Filing Nos. 10, 11 and 12.

HYDROLOGIC CALCULATIONS

Hydrologic calculations were performed using the City of Colorado Springs/El Paso County Drainage Criteria Manual, as revised in November 1991 and 1994. The Rational Method was used to estimate storm water runoff anticipated from design storms with 5-year and 100-year recurrence intervals.



APPENDIX

JOB NAME: PAINT BRUSH HILLS - PHASE 2 (FILING NO. 13)
 JOB NUMBER: 2053.21
 DATE: 06/10/08
 CALCULATED BY: MAW

FINAL DRAINAGE REPORT ~ BASIN RUNOFF COEFFICIENT SUMMARY

BASIN	TOTAL AREA (AC)	IMPERVIOUS AREA / STREETS			LANDSCAPE/UNDEVELOPED AREAS			WEIGHTED		WEIGHTED CA	
		AREA (AC)	C(5)	C(100)	AREA (AC)	C(5)	C(100)	C(5)	C(100)	CA(5)	CA(100)
RR	4.20	0.00	0.90	0.95	4.20	0.40	0.55	0.40	0.55	1.68	2.31
SS	6.14	0.00	0.90	0.95	6.14	0.35	0.45	0.35	0.45	2.15	2.76
TT1	1.05	0.00	0.90	0.95	1.05	0.35	0.45	0.35	0.45	0.37	0.47
TT2	6.10	0.00	0.90	0.95	6.10	0.30	0.40	0.30	0.40	1.83	2.44
UU1	3.05	0.00	0.90	0.95	3.05	0.35	0.45	0.35	0.45	1.07	1.37
UU2	10.60	0.00	0.90	0.95	10.60	0.35	0.45	0.35	0.45	3.71	4.77
UU3	2.75	0.00	0.90	0.95	2.75	0.35	0.45	0.35	0.45	0.96	1.24
VV1	4.85	0.00	0.90	0.95	4.85	0.35	0.45	0.35	0.45	1.70	2.18
VV2	1.30	0.00	0.90	0.95	1.30	0.37	0.50	0.37	0.50	0.48	0.65
VV3	0.40	0.20	0.90	0.95	0.20	0.35	0.45	0.63	0.70	0.25	0.28
WW1	1.20	0.00	0.90	0.95	1.20	0.35	0.45	0.35	0.45	0.42	0.54
WW2	12.80	0.00	0.90	0.95	12.80	0.35	0.45	0.35	0.45	4.48	5.76
WW3	5.20	0.00	0.90	0.95	5.20	0.35	0.45	0.35	0.45	1.82	2.34
XX1	11.45	0.00	0.90	0.95	11.45	0.35	0.45	0.35	0.45	4.01	5.15
XX2	5.72	0.00	0.90	0.95	5.72	0.35	0.45	0.35	0.45	2.00	2.57
YY	1.85	0.00	0.90	0.95	1.85	0.35	0.45	0.35	0.45	0.65	0.83
ZZ	7.01	0.00	0.90	0.95	7.01	0.30	0.40	0.30	0.40	2.10	2.80
AAA	8.95	0.00	0.90	0.95	8.95	0.30	0.40	0.30	0.40	2.69	3.58
OS-1	16.30	0.00	0.90	0.95	16.30	0.30	0.40	0.30	0.40	4.89	6.52
OS-2	29.00	0.00	0.90	0.95	29.00	0.30	0.40	0.30	0.40	8.70	11.60
OS-3	10.28	0.00	0.90	0.95	10.28	0.35	0.45	0.35	0.45	3.60	4.63
OS-4	14.84	0.00	0.90	0.95	14.84	0.35	0.45	0.35	0.45	5.19	6.68
OS-5	3.28	0.00	0.90	0.95	3.28	0.35	0.45	0.45	0.55	1.48	1.80
OS-6	0.82	0.65	0.90	0.95	0.17	0.35	0.45	0.79	0.85	0.64	0.69
H-1	92.30	0.00	0.90	0.95	92.30	0.25	0.35	0.25	0.35	23.08	32.31
H-2	1.50	0.00	0.90	0.95	1.50	0.25	0.35	0.25	0.35	0.38	0.53
H-3	18.80	0.00	0.90	0.95	18.80	0.25	0.35	0.25	0.35	4.70	6.58
H-4	121.30	3.00	0.90	0.95	118.30	0.25	0.35	0.27	0.36	32.28	44.26
H-5	55.60	0.00	0.90	0.95	55.60	0.25	0.35	0.25	0.35	13.90	19.46
H-6	4.40	0.00	0.90	0.95	4.40	0.25	0.35	0.25	0.35	1.10	1.54
H-7	14.70	0.00	0.90	0.95	14.70	0.25	0.35	0.25	0.35	3.68	5.15

JOB NAME: PAIN'T BRUSH HILLS - PHASE 2 (FILING NO. 13)
 JOB NUMBER: 2053.21
 DATE: 06/10/08
 CALC'D BY: MAW

FINAL DRAINAGE REPORT ~ BASIN RUNOFF SUMMARY

BASIN	WEIGHTED		OVERLAND				STREET / CHANNEL FLOW				Tc			TOTAL FLOWS	
	CA(5)	CA(100)	C(5)	Length (ft)	Height (ft)	Tc (min)	Length (ft)	Slope (%)	Velocity (fps)	Tc (min)	TOTAL (min)	I(5) (in/hr)	I(100) (in/hr)	Q(5) (cfs)	Q(100) (cfs)
RR	1.68	2.31	0.25	150	3	15.5	250	2.0%	4.9	0.8	16.3	3.33	5.92	6	14
SS	2.15	2.76	0.25	150	3	15.5	900	3.5%	6.5	2.3	17.8	3.20	5.68	7	16
TT1	0.37	0.47	0.25	60	0.6	12.3	350	1.0%	3.5	1.7	14.0	3.57	6.35	1	3
TT2	1.83	2.44	0.25	250	8	17.1	350	1.0%	3.5	1.7	18.8	3.11	5.53	6	13
UU1	1.07	1.37	0.25	60	1.2	9.8	900	3.0%	6.1	2.5	12.3	3.78	6.72	4	9
UU2	3.71	4.77	0.25	200	4	17.9	1200	3.0%	6.1	3.3	21.2	2.93	5.20	11	25
UU3	0.96	1.24	0.25	60	1.2	9.8	700	1.5%	4.3	2.7	12.5	3.75	6.66	4	8
VV1	1.70	2.18	0.25	200	8	14.2	350	1.5%	4.3	1.4	15.6	3.40	6.05	6	13
VV2	0.48	0.65	0.25	200	5	16.6	100	2.0%	4.9	0.3	16.9	3.27	5.81	2	4
VV3	0.25	0.28	0.25	30	1.5	5.1	200	2.0%	4.9	0.7	5.8	4.91	8.73	1	2
WW1	0.42	0.54	0.25	100	2	12.6	400	2.0%	4.9	1.3	14.0	3.57	6.35	2	3
WW2	4.48	5.76	0.25	200	4	17.9	1300	2.5%	5.5	3.9	21.8	2.88	5.13	13	30
WW3	1.82	2.34	0.25	200	4	17.9	1300	2.5%	5.5	3.9	21.8	2.88	5.13	5	12
XX1	4.01	5.15	0.25	200	4	17.9	1500	2.5%	5.5	4.5	22.4	2.84	5.05	11	26
XX2	2.00	2.57	0.25	80	1.6	11.3	1200	2.5%	5.5	3.6	14.9	3.47	6.17	7	16
YY	0.65	0.83	0.25	300	15	16.2					16.2	3.34	5.94	2	5
ZZ	2.10	2.80	0.25	300	4	25.0					25.0	2.68	4.76	6	13
AAA	2.69	3.58	0.25	1000	32	34.2					34.2	2.24	3.99	6	14

JOB NAME: PAINT BRUSH HILLS - PHASE 2 (FILING NO. 13)
 JOB NUMBER: 2053.21
 DATE: 06/10/08
 CALCULATED BY: MAW

FINAL DRAINAGE REPORT ~ SURFACE ROUTING SUMMARY

Design Point(s)	Contributing Basins	Equivalent CA(5)	Equivalent CA(100)	Maximum Tc	Intensity		Flow		Inlet Size
					I(5)	I(100)	Q(5)	Q(100)	
34C	DP-34B, V1, PR-6, PR-21	83.05	101.53	43.1	1.9	3.3	154	337	Exist. Dual 42"
34D	PR-55, YY, ZZ	40.70	53.16	34.7	2.2	4.0	91	210	Exist. Pond
35	OS-2, QQ1	9.43	12.57	23.3	2.8	5.0	26	62	36" RCP
36	QQ2	0.18	0.23	13.1	3.7	6.5	1	2	4' TYPE R
37	QQ3	1.67	2.20	17.2	3.3	5.8	5	13	4' TYPE R
38	TT1	0.37	0.47	14.0	3.6	6.4	1	3	4' TYPE R
39	OS-1, TT2	6.72	8.96	26.0	2.6	4.7	18	42	20' TYPE R
40	UU3	0.96	1.24	12.5	3.7	6.7	4	8	4' TYPE R
41	UU1, UU2	4.78	6.14	21.2	2.9	5.2	14	32	14' TYPE R
42	WW3	1.82	2.34	21.8	2.9	5.1	5	12	4' TYPE R
43	WW1, WW2	4.90	6.30	21.8	2.9	5.1	14	32	14' TYPE R
44	VV1	1.70	2.18	15.6	3.4	6.0	6	13	14' TYPE R
45	XX2	2.00	2.57	14.9	3.5	6.2	7	16	6' TYPE R
46	XX1	4.01	5.15	22.4	2.8	5.1	11	26	10' TYPE R

34C

JOB NAME: PAINT BRUSH HILLS - PHASE 2 (FILING NO. 13)
 JOB NUMBER: 2053.21
 DATE: 06/10/08
 CALCULATED BY: MAW

* PIPES ARE LISTED AT MAXIMUM SIZE REQUIRED TO ACCOMMODATE Q100 FLOWS AT MINIMUM GRADE.
 REFER TO INDIVIDUAL PIPE SHEETS FOR HYDRAULIC INFORMATION.

FINAL DRAINAGE REPORT ~ PIPE ROUTING SUMMARY

Pipe Run	Contributing Basins	Equivalent CA(5)	Equivalent CA(100)	Maximum Tc	Intensity		Flow		Pipe Size*
					I(5)	I(100)	Q(5)	Q(100)	
45	DP-41	4.78	6.14	21.2	2.93	5.20	14	32	30"
46	PR-44, PR-45	5.74	7.38	22.0	2.87	5.10	16	38	30"
47	DP-44 Pickup	1.11	1.35	15.6	3.40	6.05	4	8	18"
48	PR-46, PR-47	6.85	8.73	22.4	2.84	5.06	19	44	36"
49	DP-42	1.82	2.34	22.0	2.87	5.10	5	12	24"
50	DP-43	4.90	6.30	22.0	2.87	5.10	14	32	30"
51	PR-43, PR-49, PR-50	25.09	33.07	30.7	2.39	4.25	60	141	54"
52	PR-48, PR-51	31.94	41.80	31.2	2.37	4.21	76	176	54"
53	DP-45	2.00	2.57	14.9	3.47	6.17	7	16	24"
54	DP-46	4.01	5.15	22.4	2.84	5.05	11	26	30"
55	PR-52, PR-53, PR-54	37.95	49.53	32.7	2.30	4.10	87	203	54"
56	1/2 DP34B	35.77	43.81	40.1	2.04	3.63	73	159	48"
57	1/2 DP34B	35.77	43.81	40.1	2.04	3.63	73	159	48"

> 1st
 > 1st
 > 1st

Custom Soil Resource Report for El Paso County Area, Colorado

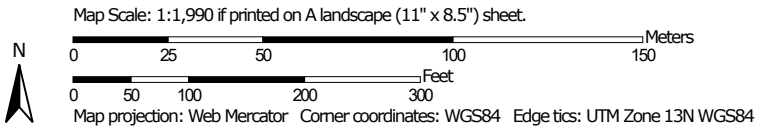
Sub-basin ZZ and XX2



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Custom Soil Resource Report Soil Map



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)




















Soils







 Soil Map Unit Polygons

 Soil Map Unit Lines


 Soil Map Unit Points

Special Point Features






-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features


Water Features

 Streams and Canals

Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: El Paso County Area, Colorado
 Survey Area Data: Version 18, Jun 5, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 11, 2018—Oct 20, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
71	Pring coarse sandy loam, 3 to 8 percent slopes	8.9	100.0%
Totals for Area of Interest		8.9	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

El Paso County Area, Colorado

71—Pring coarse sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 369k
Elevation: 6,800 to 7,600 feet
Farmland classification: Not prime farmland

Map Unit Composition

Pring and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pring

Setting

Landform: Hills
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Arkosic alluvium derived from sedimentary rock

Typical profile

A - 0 to 14 inches: coarse sandy loam
C - 14 to 60 inches: gravelly sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: R048AY222CO
Hydric soil rating: No

Minor Components

Pleasant

Percent of map unit:
Landform: Depressions
Hydric soil rating: Yes

Other soils

Percent of map unit:
Hydric soil rating: No

Stormwater Management Plan (SWMP)

for

Pumphouse 6 Utility Building

Site Development Plan

Owner/Operator:

Paint Brush Hills Metropolitan District
Robert Guevara
9985 Towner Avenue
Falcon, CO 80831
(719) 495-8188

Engineer/SWMP Preparer:

RG and Associates, LLC
Jordan Schneider, P.E.
4885 Ward Rd, Suite 100
Wheat Ridge, CO 80033
(303) 468-8476

Contractor:

Company: (TBD after project is awarded)
SW Manager Name: _____
Address: _____

Phone: _____

Qualified Stormwater Manager:

Company: _____
SW Manager Name: _____
Address: _____

Phone: _____

SWMP Preparation Date: 4/5/2023

SWMP Revision Date: 7/7/2023

Revision No. 2

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Objectives:

The SWMP identifies possible pollutant sources that may contribute to stormwater pollution and identifies control measures to reduce or eliminate potential water quality impacts during construction activities. The SWMP must be completed and implemented prior to project breaking ground and revised by the contractor's Qualified Stormwater Manager as construction proceeds, to accurately reflect the conditions and practices at the site until final stabilization is reached. The SWMP meets the minimum requirements to comply with the State of Colorado CDPS General Permit for Stormwater Discharges Associated with Construction Activity, and the local regulations.

General Instructions:

To fill out the Stormwater Management Plan (SWMP) Template, select (double right click) the [blue text](#) and enter applicable information. When a blue box is present, check the applicable selection. **No sections shall be left blank!** If a section is "Not Applicable" to the project, select the [blue text](#) and enter "N/A".

Basic Acronyms:

BMP: Best Management Practices

ESCP: Erosion and Sediment Control Plan (Site Map)

CM: Control Measures

ECB: Erosion Control Blanket

MS4: Municipal Separate Storm Sewer System

SCL: Sediment Control Log

TOP: Temporary Outlet Protection

SECTION 1: SITE EVALUATION, ASSESSMENT, AND PLANNING

1.1 Project/Site Information

Project/Site Name: PBHMD Pump House #6

Project Location: Tract A and Tract B lie between Keynes Drive and Rockingham Drive on the western edge of the Paint Brush Hills Metropolitan District.

See **Appendix A** for a Vicinity Map.

County: El Paso **City:** Peyton **State:** CO **ZIP Code:** 80831

Subdivision/Project: Pump House 6

1.2 Contact Information/Responsible Parties

Owner/Operator

Paint Brush Hills Metropolitan District

Robert Guevara

9985 Towner Avenue, Peyton, CO 80831

Office #: (719) 495-8188

Email: robert@pbhmd.com

Site Superintendent:

Name: _____

Title: _____

Address: _____

Office #: _____ Cell #: _____ Email: _____

Qualified Stormwater Manager: Individual responsible for implementing, maintaining, and revising the SWMP, knowledgeable in the principles and practices of ESC and pollution prevention, with the skills to:

- Assess conditions at construction sites that could impact stormwater quality,
- Assess the effectiveness of stormwater controls, and
- Perform inspections.

Primary Stormwater Manager:

Name: (TBD after project is awarded) _____

Title: _____

Address: _____

Office #: _____ Cell #: _____ Email: _____

SWMP Prepared By:

RG and Associates, LLC

Jordan Schneider, PE; Project Engineer

4885 Ward Road, Suite 100

Wheat Ridge, CO 80033

Office #: (303) 468-8476

Cell #: (907) 440-9963

Email: jschneider@rgengineers.com

1.3 Nature and Sequence of Construction Activity

Project scope of work:

The scope of work for the Pump House 6 Project consists of the removal of an existing storage shed which houses hypochlorite storage and a pump feed system, a wooden fence, and an 8’x15’ wooden lean-to structure with a sheet metal roof for existing pump controls and VFDs. Construction consists of a 40’x22’ pump house for existing wells no. 10, 11, and 12 to enclose existing pump controls, sodium hypochlorite storage and feed, underground vault with associated piping, flow meters, and PRVs. 0.63 acres of the total 3.78 acres of the two parcels will be disturbed. The remainder will be left as maintained open space.

The sequence of construction activity in general will consist of temporary stabilization, installation of initial control measures, flatwork, final grading, final stabilization, and removal of temporary control measures.

Type of construction activity:

- Residential Commercial Industrial Road Construction
 Linear Utility Other (please specify):

Estimated Project Start Date: Summer 2023
Estimated Project Completion Date: Fall 2023
Estimated Project Final Stabilization: Fall 2023

Major phases of Construction:

- Initial CM Demolition Grading
 Utility Installation Interim CM Road Construction
 Vertical Construction Final Grade Final Stabilization CM
 Other:

Earth Work Summary:

Cut: 135.56 CY
Fill: 61.64 CY

1.4 Soils, Drainage Patterns, and Vegetation

Soil type:

The National Resources Conservation Service (NRCS) Site Soil Mapping shows the site to be 98% Pring Coarse Sandy Loam and 2% Columbine Gravelly Sandy Loam. Pring Coarse Sandy Loam is identified as being part of Hydrologic Soil Group B. Columbine Gravelly Sandy Loam is identified as being part of Hydrologic Soil Group A.

Soil’s erosion potential:

According to the Soil Survey of El Paso County Area, Colorado, The Pring coarse sandy loam soils are deep and well drained, with rapid permeability and moderate water capacity. Surface runoff is

medium, and the hazard of erosion is moderate. Erosion control practices are needed to control soil blowing and water erosion on construction sites where the ground cover has been removed.

The Columbine gravelly sandy loam soils are dep, well drained to excessively drained, with very rapid permeability and low to moderate water capacity. Surface runoff is slow, and the hazard of erosion is slight to moderate.

Erosion control measures such as silt fence and sediment control logs will be installed prior to construction to prevent sediment migration from the site due to stormwater runoff.

Drainage pattern:

The Pumphouse 6 Site generally slopes to the southwest to Pond C of Tract A of Paint Brush Hills Filing No. 12. Pond C is considered to be on-site.

Existing Vegetation:

The Site consists of the following native weeds and grasses: Crested Wheat Grass, Perennial Rye, Western Wheat Grass, Smooth Brome Grass, Side oats Grama, Little Bluestem, Sand Dropseed, Switch Grass, Weeping Love Grass, Slender Wheat Grass. Methods used to determine approximately 10% vegetative ground cover of the Site included Site visits, photographs of the Site, and aerial imagery of the Site.

Comment generated due to changes from the previous submittal: Previously it was stated there was 70% vegetated ground cover. 10% cover is very low. This percentage should represent the percentage of the vegetal cover of the pervious areas, not the percent of the site that is pervious. If site was previously graded or land use was such that there is no or minimal vegetation, the % cover required for final stabilization should then be based on neighboring properties to show natural native vegetative cover (ie: an adequate reference site). If surrounding sites are also being developed, use historic aerial photos to make determination. approximately 0.64 acres.

1.5 Construction Site Estimates

Total site area:

The total area of the Site is approximately 3.78 acres.

Area to be disturbed:

The total area of disturbance is expected to be approximately 0.64 acres.

1.6 Receiving Waters

Name and description of watershed:

The Site is located within the Falcon Area Drainage Basin and ultimately discharges to Black Squirrel Creek via storm sewer and open channel systems.

Distance from the project to the closest receiving water:

The Site is approximately 1 mile from Black Squirrel Creek.

Description of all stream crossings located within the construction site boundary:

There are no stream crossings located within the construction site boundary.

1.7 Protected Site Features and Sensitive Areas

Describe unique site feature or sensitive area to be preserved during construction:

There are no known unique site features or sensitive areas to be preserved during construction. The Site is within a residential subdivision and any unique site features, or

sensitive areas have been identified by the Master Development Drainage Plan Report for the subdivision; none were identified. Erosion and sediment control measures are to be implemented for construction of the pumphouse to mitigate sediment runoff to the adjacent stormwater pond.

Describe any known soil or groundwater contamination:

Contaminated soils and/or groundwater are not anticipated on this project.

Describe management plan for contaminated soils and/or groundwater:

Contaminated soils and/or groundwater are not anticipated on this project.

1.8 Potential Sources of Pollution

Potential Pollution Source	Potential on this site?	Control Measures (CM)	CM Implementation (as needed)
Disturbed & Stored Soils - grading - spoils - stockpiles	YES	ESC CMs (IP, SF, SSA, TRM, RECP, TOP, SCL, SBB, RS, SB, ST) Preservation of existing vegetation (PV, VB, CF, CP) Materials management Solid waste management (SP, GH) Stockpile management (SP) Vehicle tracking control (VTC)	1. Delineate protected areas prior to construction. 2. Install CMs prior to construction. 3. Manage materials effectively once they arrive on site. 4. Place trash receptacles prior to construction. 5. Implement spill response. 6. Implement stockpile management controls. 7. Delineate vehicle travel areas prior to construction, adjust as needed.
Vehicle Tracking - all permitted vehicle traffic	YES	ESC CMs (IP, SF, SSA, TRM, RECP, TOP, SCL, SBB, RS, SB, ST) Vehicle traffic controls Vehicle tracking controls (VTC) Street sweeping (SS)	1. Install CMs prior construction. 2. Delineate vehicle travel areas prior to construction, adjust as needed. 3. Install VTC prior to construction. 4. Implement SS as needed, in conjunction with start of construction.
Contaminated Soils	NO	Hazardous materials management (GH, CT) Spill response & notification (GH) Stockpile management (SP)	1. Implement hazardous materials management. 2. Implement spill response procedures. 3. Implement stockpile management controls.

* Refer to Section 2, for acronyms used to identify CM details.

Potential Pollution Source	Potential on this site?	Control Measures (CM)	CM Implementation
----------------------------	-------------------------	-----------------------	-------------------

Loading & Unloading - construction materials	YES	Material management (GH) Vehicle traffic controls (VTC)	1. Manage materials effectively once they arrive on site. 2. Delineate vehicle travel areas prior to construction, adjust as needed.
Vehicle or equipment maintenance & fueling - gas, oil, - diesel - lubricants - hydraulic fluids	YES	Spill prevention controls (GH) Designated fuel storage area (GH) Spill response & notification (GH)	1. Designate fuel storage area. 2. Implement spill prevention controls. 3. Implement spill response and notification procedures.
Outdoor storage - building materials - fertilizers - chemicals	NO	Material storage procedures (GH)	1. Designate material storage areas prior to delivery. 2. Materials left outdoors must be covered if they can pollute stormwater. 3. Secondary containment must be used for hazardous materials.
Dust - wind transport - saw cutting	YES	Dust control (DC) Temporary soil stabilization (SF, SD, GB, SSA, TRM, RECP, TOP) Street sweeping (SS) Preservation of existing vegetation (PV, VB, CF)	1. Delineate protected areas prior to construction. 2. Implement dust control in conjunction with soil disturbing activities. 3. Implement temporary soil stabilization measures as soon as practical. 4. Implement street sweeping at the start of major construction and maintain as needed.
Routine Maintenance Activities - fertilizers - pesticides - detergents - solvents - fuels, oils, etc.	NO	Material storage (GH) Hazardous waste management (GH, CT) ESC CMs (IP, SF, SSA, TRM, RECP, TOP, SCL, SBB, RS, SB, ST)	1. Designate materials storage areas prior to site arrival. 2. Practice hazardous waste management procedures during the storage of such materials. 3. Install ESC measures prior to landscape work.
Non-industrial Waste - worker trash - portable toilets	YES	Sanitary waste (GH) Solid waste management (GH)	1. Place temporary sanitary facilities on site and prevent off-site discharges. 2. Place trash receptacles on site.
On-site Industrial Waste - construction debris, etc.	YES	Waste management (GH) Liquid waste management (GH) Hazardous waste management (GH, CT)	1. Place trash receptacles on site. 2. Place designated watertight receptacles or washout area(s) prior to activities that produce liquid waste. 3. Implement hazardous waste management procedures.

* Refer to Section 2, for acronyms used to identify CM details.

Potential Pollution Source	Potential on this site?	Control Measures (CM)	CM Implementation
Concrete Truck Chute/Tool Washing	YES	Concrete washout area (CWA)	Install designated concrete washout(s) prior to concrete work.
Drywall Mud and Paint	NO	Liquid waste management (GH)	Place designated watertight receptacles or washout area(s) prior to activities that produce liquid waste.
Fly Ash - concrete - flow fill	YES	Concrete washout area (CWA) Hazardous waste management (GH)	1. Install designated CWA prior to concrete activities. 2. Implement hazardous waste management procedures.
Dedicated: - asphalt plants - concrete batch plants - masonry mixing stations	NO	Secondary containment Concrete washout area (CWA) Solid waste management (GH) Materials management (GH)	1. Install secondary containment CMs prior to using dedicated batch plants. 2. Establish dedicated washout area before construction begins. 3. Place trash receptacles on site. 4. Manage materials effectively once they arrive on site.
Waste from: - geo-tech test - potholing - saw cutting - utility borings for locates	NO	Dust control (DC) Material storage (GH) Solid waste management (GH)	1. Implement dust control in conjunction with soil disturbing activities. 2. Designate materials storage areas prior to their arrival on site. 3. Place trash receptacles on site.
Demolition of infrastructure: - concrete curb - asphalt road - steel/rebar	NO	Dust control (DC) Solid waste management (GH)	1. Implement dust control in conjunction with soil disturbing activities. 2. Place trash receptacles.
Electric Generator - pump	NO	Secondary containment Spill response & notification (GH) Hazardous waste management (GH, CT)	1. Install secondary containment CMs prior to using generators. 2. Implement hazardous waste management procedures.
Areas where <u>potential spills</u> can occur	NO	Hazardous waste management (GH) Spill response & notification (GH)	1. Implement hazardous waste management. 2. Implement spill response and notification procedures.

* Refer to Section 2, for acronyms used to identify CM details.

1.9 Potential Hazardous Material & Chemical Pollutants to Stormwater

Potentially on Site?	Material/ Chemical	Physical Description	Stormwater Pollutants	Location
NO	Fertilizer	Liquid or solid grains	Nitrogen, phosphorous	Newly seeded areas

NO	Cleaning solvents	Colorless, blue, or yellow-green liquid	Perchloroethylene, methylene chloride, trichloroethylene, petroleum distillates	Staging areas
NO	Asphalt	Black solid	Oil, petroleum distillates	Streets
YES	Concrete and Grout	White solid/grey liquid	Limestone, sand, pH, chromium	Curb and gutter, sidewalk, building construction
YES	Curing compounds	Creamy white liquid	Naphtha	Curb and gutter, sidewalk, driveways, concrete slabs
YES	Hydraulic oil / fluids	Brown, oily petroleum hydrocarbon	Mineral oil	Leaks or broken hoses from equipment
YES	Gasoline	Colorless, pale brown or pink petroleum hydrocarbon	Benzene, ethyl benzene, toluene, xylene, MTBE	Secondary containment/staging area
YES	Antifreeze / coolant	Clear green/yellow liquid	Ethylene glycol, propylene glycol, heavy metals (copper, lead, zinc)	Leaks or broken hoses from equipment or vehicles
YES	Sanitary toilets	Various colored liquid	Bacteria, parasites, and viruses	Staging areas

1.10 Anticipated Sources of Authorized Non-stormwater Discharge

Description and location of any anticipated allowable sources of non-stormwater discharge at the site. Check if applicable:

Natural springs, only if:

- Uncontaminated, and
- Spring flows are not exposed to land disturbance

Landscape irrigation return flow

Emergency fire fighting

Concrete washout (CWA), only if:

- Liquids from washing concrete tools and concrete mixer chutes are properly contained, and
- No concrete washout water leaves the site as surface runoff or reaches receiving waters.

Liner under CWA is required if:

- The groundwater table level is high.
- CWA is within 400 feet of any natural drainage pathway or waterbody, or
- CWA is within 1,000 feet of any wells or drinking water sources.

Check if the CWA liner is needed for this site.

Description of any other anticipated allowable sources of non-stormwater discharge at the site:

There are no other anticipated allowable sources of non-stormwater discharge at the site. If other sources of non-stormwater discharge are encountered at the site, they will be recorded on the SWMP maps and control measures will be implemented accordingly.

SECTION 2: EROSION & SEDIMENT CONTROL MEASURES

2.1 Sediment Control Measures

Silt Fence (SF)		<input type="checkbox"/> <i>Permanent</i>	<input checked="" type="checkbox"/> <i>Temporary</i>
What: Description	SF is a woven geotextile fabric attached to wooden posts and trenched into the ground. It is used to intercept sheet flow runoff from disturbed areas.		
When: Installation	SF shall be installed prior to land disturbing activities. SF shall be removed when the upstream area is stabilized.		
Where: Location	SF shall be installed at the locations identified on the SWMP. SF is typically installed along the contour of slopes, which is down slope of a disturbed area to accept sheet flow and placed along the perimeter of a construction site. <i>SF is not designed to receive concentrated flow, or to be used a filter fabric.</i>		
How: Maintenance & Inspection	SF shall be installed per detail (Appendix 4). Inspect regularly and maintain SF throughout construction. Any section of SF that has a tear, hole, slumping, undercutting or has been bypassed shall be replaced. Accumulated sediment shall be removed before it reaches a depth of ½ the height of the of the silt fence usually 6 inches.		

Sediment Control Log (SCL)		<input type="checkbox"/> <i>Permanent</i>	<input checked="" type="checkbox"/> <i>Temporary</i>
What: Description	SCL, aka “Straw Wattle”, is a linear roll made of natural materials (straw, coconut fiber or other fibrous material), trenched into the ground, and held with wooden stakes, used to intercept sheet flows from disturbed areas.		
When: Installation	SCL shall be installed during land disturbing activities, and it may also be installed after formation of a stockpile. Once the upstream area is stabilized, remove, and properly dispose of the SCL. If disturbed areas exist after removal, the area shall be covered with topsoil, seeded, and mulched.		
Where: Location	SCL shall be installed at the locations identified on the ECSP. SCL are typically used for stockpile control, IP, and CD in small drainage ditches, on disturbed slopes to shorten flow lengths and/or as part of multi-layered perimeter control along receiving waters such as a stream, pond, or wetland. SCL work well in combination with other layers of erosion and sediment controls. Stockpiles stored on impervious surfaces shall not be placed in a flowline and SCL shall be weighted. Stockpiles stored on pervious surfaces may be protected by pervious SCL, SF or adequate vegetative cover.		
How: Maintenance & Inspection	SCL shall be installed per detail (Appendix 4), along (parallel) the slope contour to avoid concentrating flows. Inspect regularly and maintain SCL throughout construction as they will eventually degrade. Accumulated sediment shall be removed before the depth is ½ the height of the SCL.		

Inlet Protection (IP)		<input type="checkbox"/> Permanent	<input checked="" type="checkbox"/> Temporary
What: Description	IP is a permeable barrier that is installed around an inlet drain to filter runoff and remove sediment before entering the storm system. IP can be constructed of: RS, SCL, SF, blocks and RS, or other materials.		
When: Installation	Install IP for existing catch basins prior to land disturbing activities upslope from the inlet. IP for proposed catch basins shall be installed immediately after the drain is constructed. IP and associated sediment must be removed and properly disposed of when the drainage area upstream is stabilized.		
Where: Location	Install IP at the locations identified on the EC Plan. IP is not a stand-alone measure. It shall be used in conjunction with other up gradient measures.		
How: Maintenance & Inspection	Install IP per detail (Appendix 4). IP shall enable the drain to function without completely blocking the flow. Inspect regularly and maintain IP throughout construction as it is the final measure before runoff enters the storm drain. Accumulated sediment shall be removed when it has reached ½ of the height of the IP or loses functionality, whichever comes first. IP is not standalone measure and shall be part of redundant system.		

Rock Sock (RS)		<input type="checkbox"/> Permanent	<input checked="" type="checkbox"/> Temporary
What: Description	RS is an elongated cylindrical filter constructed of gravel wrapped by wire mesh or woven geotextile (aka “curb socks” if placed at angles at curb line).		
When: Installation	Install RS prior to land disturbing activities, once upstream stabilization is complete. Accumulated sediment shall be removed and properly disposed of.		
Where: Location	RS shall be installed at the locations identified on the EC Plan. They are used for perimeter control of a disturbed area, or as part of IP.		
How: Maintenance & Inspection	Install RS per detail (Appendix 4). Inspect regularly and maintain RS as they are susceptible to displacement and breakage due to vehicle traffic. Accumulated sediment shall be removed to maintain functionality.		

2.2 Erosion Control Measures

Temporary and Permanent Seeding (TS/PS)		<input checked="" type="checkbox"/> Permanent	<input checked="" type="checkbox"/> Temporary
What: Description	Seed is applied to disturbed areas in an effort to establish vegetation. TS is used to stabilize disturbed areas that will be inactive for an extended period. PM is used to stabilize areas at final grade that will not be otherwise stabilized. Effective seeding includes preparation of a seedbed, selection of an appropriate seed mixture, proper planting techniques, and protection of the seeded area with mulch, geotextile, or other appropriate measures. Mulching helps to protect the bare soil and must be secured by crimping, tackifiers, netting or other measures.		
When: Installation	TS/PS shall be performed on temporary inactive surfaces and following the completion of final grading.		

Where: Location	TS/PS shall be completed in the locations identified on the SWMP to stabilize areas at final grade that will not otherwise be stabilized.
How: Maintenance & Inspection	TS/PS and secured mulching shall be installed per seed mix specifications and detail (Appendix 4). Continuously inspect and maintain TS/PS and secured mulch throughout construction. Prepare the seedbed, select an appropriate seed mixture, use proper planting techniques, and protect the seeded area with secured mulch.

Wind Erosion/Dust Control (DC)

Permanent **Temporary**

What: Description	DC helps keep sediments (from soils and stockpiles) from entering the air as a result of land disturbing construction activities. A variety of practices that focus on grading disturbed areas may be used.
When: Installation	Implement DC during conditions which result in the formation of dust from either construction activities or from naturally occurring winds. Do not overwater.
Where: Location	Dust abatement shall be completed throughout the project area where any material exists that has the potential to become airborne.
How: Maintenance & Inspection	DC measures shall be performed per detail (Appendix 4). Apply water or magnesium chloride, seed and mulch or use spray-on soil binders on disturbed areas. Water and magnesium chloride shall be applied such that concentrated flows do not form.

2.3 Materials Management Control Measures

Concrete Washout Areas (CWA)

Permanent **Temporary**

What: Description	A CWA is a specific area of the construction site designated and managed for concrete washing activities. Options available: excavation of a pit in the ground, use of an above ground storage area or use of prefabricated haul-away concrete washout containers.
When: Installation	CWA shall be installed prior to any concrete delivery to the construction site; and remove upon termination of use of the washout. Accumulated solid waste, including concrete waste and any contamination soils, must be removed from the site to a designated disposal location.
Where: Location	CWA shall be installed at the locations identified on the SWMP. If the groundwater table is high; or if the CWA will be placed within 400 ft of a natural drainage pathway/waterbody; or within 1,000 ft of a wells or drinking water source, it must be lined.

How: Maintenance & Inspection	CWA shall be installed per detail (Appendix 4). Inspect regularly and maintain CWA throughout construction. Ensure adequate signage is in place identifying the location of the CWA. Remove concrete waste when filled to about ⅔ of CWA capacity to maintain functionality.
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Stockpile Management (SP)

Permanent **Temporary**

What: Description	SP includes measures to minimize erosion and sediment transport from stockpiles. SP shall be used when soils or other erodible materials are stored at a construction site.
When: Installation	SP locations shall be determined during construction. If temporary removal of a CM is necessary to access the SP, ensure CMs area re-installed per detail drawing. When SP is no longer needed, properly dispose of excess materials, and re-vegetate or stabilize the ground surface where the SP was located.
Where: Location	SP locations shall be placed away from areas where concentrated stormwater flow is anticipated, major drainage ways, gutters, and storm sewer inlets. SP locations shall be noted on the SWMP.
How: Maintenance & Inspection	SP shall be installed per detail (Appendix 4). Inspect regularly and maintain SP throughout construction. It is recommended to place SP on a pervious surface and protected from sediment transport with measures such as SCL, VB and/or SF. SP are only allowed on impervious surfaces if no other practical alternative exists. Provide weighted sediment control measures around the perimeter of the SP, such as RS or sandbags.

Street Sweeping (SS)

Permanent **Temporary**

What: Description	SS is used where vehicles track sediment onto paved roadways to reduce the transport of it into storm drain systems or surface waterways.
When: Installation	Manual SS or mechanical vacuuming SS shall be conducted when there is noticeable sediment accumulation on roadways adjacent to the construction site. SS shall be completed prior to any precipitation events, at the end of the workday as needed, and at the end of construction.
Where: Location	SS shall be utilized throughout the site and also on adjacent areas to construction.
How: Maintenance & Inspection	SS shall be performed per detail (Appendix 4). Use standard SS equipment to adequately remove sediment from roadways adjacent to the construction site.

2.4 Site Management Control Measures

Limits of Construction (LOC)	
<input type="checkbox"/> Permanent <input checked="" type="checkbox"/> Temporary	
What: Description	LOC is used to designate the area of land that will be disturbed by construction activities.
When: Installation	The permitted LOC shall be designated prior to land disturbing activities. If land is disturbed <u>outside</u> of the limits, then the State and Local stormwater construction discharge permits, and SWMP/EC Plan must be amended.
Where: Location	The permitted LOC shall be identified on the EC Plan.
How: Maintenance & Inspection	LOC are typically delineated by silt fence or construction fence. Inspect LOC continuously and maintain the permitted LOC in an effort to not disturb land outside of the boundaries.
Vehicle Tracking Control (VTC)	
<input type="checkbox"/> Permanent <input checked="" type="checkbox"/> Temporary	
What: Description	VTC is a stabilized site access point that helps remove sediment from vehicle tires and reduces tracking of sediment onto paved surfaces.
When: Installation	Install VTC prior to any land disturbing activities; and removed when there is no longer the potential for vehicle tracking to occur.
Where: Location	VTC shall be installed at the location identified on the SWMP. Locate VTC where frequent vehicle traffic will exit the construction site onto a paved roadway.
How: Maintenance & Inspection	VTC shall be installed per detail (Appendix 4). All VTC must have non-woven geotextile fabric between the soil and rock pad. <u>Recycled concrete aggregate is not allowed because concrete dust elevates pH in stormwater.</u> Inspect regularly and maintain VTCs throughout construction. If the area becomes clogged with sediment, remove, and dispose of excess sediment or replace material with a fresh layer of rock. Any sediment that is tracked onto adjacent roadways shall be cleaned with brooms, shovels (no water washing), or mechanically cleaned with a street vacuum sweeper.
Stabilized Staging Area (SSA)	
<input type="checkbox"/> Permanent <input checked="" type="checkbox"/> Temporary	
What: Description	SSA is a clearly designated area where construction equipment and vehicles, stockpiles, waste bins and other construction-related materials are stored. If the construction site is big, more than one SSA may be necessary.

<i>When: Installation</i>	SSA shall be installed prior to any land disturbing activities.
<i>Where: Location</i>	SSA shall be installed at the location identified on the SWMP.
<i>How: Maintenance & Inspection</i>	SSA shall be installed per detail (Appendix 4). Inspect regularly and maintain SSA throughout construction. A stable surface cover of rigid gravel shall be maintained as well as repairing any perimeter controls and following good housekeeping practices.

2.5 Narrative Description of BMP Control Measures

Installations of BMPs are staged in order to minimize the potential for pollutants in the stormwater discharge. Specifically, the proposed project will use silt fence, sediment control log / rock sock, erosion control blanket, a vehicle tracking control pad, stabilized staging area, concrete washout area, inlet protection, mulching, and reseeded to mitigate the potential for erosion across the site.

SECTION 3: CONSTRUCTION SITE PHASING & ESC PLAN

3.1 Construction Site Phasing Summary

Construction of Pumphouse 6 will occur in three phases, being the initial, interim, and final phases.

The initial phase will consist of site grading and the construction of the new pumphouse, and any other construction activities associated with the construction of the new pumphouse. Initial control measures shall be installed prior to the beginning of construction activities. Initial control measures will include silt fence, sediment control log, inlet protection, vehicle tracking control, and a stabilized staging area. Any downstream, offsite storm inlets susceptible to storm water flow from the Site construction area are to be protected by inlet protection. A concrete washout area will be installed prior to concrete being delivered to the Site.

Final stabilization will occur after all concrete and site work has been completed. Final stabilization is achieved when all ground disturbing activities are complete and all disturbed areas either have a uniform vegetative cover with individual plan density of 70 percent of pre-disturbance levels established or equivalent permanent alternative stabilization method is implemented. All temporary sediment and erosion control measures shall be removed upon final stabilization and before permit closure. Erosion control blanket will be installed on all slope's steeper than 3:1.

Vehicle tracking of soils and construction debris off-site shall be minimized. Materials tracked offsite shall be cleaned up and properly disposed of immediately. Construction activity is to be finalized upon El Paso County inspection for approval of final stabilized conditions.

3.2 Standard Notes For El Paso County Grading And Erosion Control Plans

1. Stormwater discharges from construction sites shall not cause or threaten to cause pollution, contamination, or degradation of State Waters. All work and earth disturbance shall be done in a manner that minimizes pollution of any on-site or off- site waters, including wetlands.
2. 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.
3. A separate Stormwater Management Plan (SMWP) for this project shall be completed and an Erosion and Stormwater Quality Control Permit (ESQCP) issued prior to commencing construction. During construction the SWMP is the responsibility of the designated Qualified Stormwater Manager or Certified Erosion Control Inspector and shall be located on site at all times during construction and shall be kept up to date with work progress and changes in the field.
4. Once the ESQCP is approved and a "Notice to Proceed" has been issued, the contractor may

install the initial stage erosion and sediment control measures as indicated on the approved 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 staff.

5. Control measures must be installed prior to commencement of activities that may contribute pollutants to stormwater. Temporary sediment and erosion control measures for all slopes, channels, ditches, or any disturbed land area shall be completed immediately upon completion of the disturbance.
6. All temporary sediment and erosion control measures shall be maintained and remain in effective operating condition until permanent soil erosion control measures are implemented and final stabilization is established. All persons engaged in land disturbance activities shall assess the adequacy of control measures at the site and identify if changes to those control measures is needed to ensure the continued effective performance of the control measures. All changes to temporary sediment and erosion control measures must be incorporated into the Stormwater Management Plan prior to implementation.
7. Temporary stabilization shall be implemented on disturbed areas and stockpiles where ground disturbing construction activity has permanently ceased or temporarily ceased for longer than 14 days. An area that is going to remain in an interim state for more than 60 days shall also be stabilized.
8. Final stabilization must be implemented at all applicable construction sites. Final stabilization is achieved when all ground disturbing activities are complete and all disturbed areas either have a uniform vegetative cover with individual plant density of 70 percent of pre-disturbance levels established or equivalent permanent alternative stabilization method is implemented. All temporary sediment and erosion control measures shall be removed upon final stabilization and before permit closure.
9. All permanent stormwater management facilities shall be installed as defined in the approved plans. Any proposed changes that affect the hydrology or hydraulics of a permanent stormwater management structures must be approved by the ECM Administrator prior to implementation.
10. Any earth disturbance shall be conducted in such a manner so as to effectively minimize 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. Pre-existing vegetation shall be protected and maintained within 50 horizontal feet of the waters of the state, unless infeasible.
11. Compaction of soil must be prevented in areas designated for infiltration control measures or where final stabilization will be achieved by vegetative cover. Areas designated for infiltration control shall also be protected from sedimentation during construction until final stabilization is achieved.
12. Any temporary or permanent facility designed and constructed for the conveyance of stormwater around, through, or from the earth disturbance area shall be a stabilized conveyance designed to minimize erosion and the discharge of sediment off site.
13. 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. Concrete washout shall not be located in an area where shallow groundwater may be present, or within 50 feet of a surface water body.

14. Dewatering operations: uncontaminated ground water may be discharged on site but may not leave the site in the form of surface runoff.
15. Erosion control blanketing is to be used on slopes steeper than 3:1.
16. Building, construction, excavation, or other waste materials shall not be temporarily placed or stored in the street, alley, or other public way, unless in accordance with an approved Traffic Control Plan. BMP's may be required by El Paso County Engineering if deemed necessary, based on specific conditions and circumstances.
17. Vehicle tracking of soils and construction debris off-site shall be minimized. Materials tracked offsite shall be cleaned up and properly disposed of immediately.
18. 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.
19. 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.
20. 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 the original manufacturer's labels.
21. 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.
22. Bulk storage of petroleum products or other liquid chemicals in excess of 55 gallons shall have adequate secondary containment protection to contain all spills and prevent any spilled material from entering State Waters, including any surface or subsurface storm drainage system or facilities.
23. No person shall cause the impediment of stormwater flow in the flow line of the curb and gutter or in the ditch flow line.
24. 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.

25. All construction traffic must enter/exit the site at approved construction access points.
26. Prior to actual construction the permittee shall verify the location of existing utilities.
27. A water source shall be available on-site during earthwork operations and utilized as required to minimize dust from earthwork equipment and wind.
28. The soils information for this site is based upon United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) for El Paso County, Colorado.
29. At least ten (10) days prior to the anticipated start of construction, for projects that will disturb 1 acre or more, the owner or operator of construction activity shall submit a permit application for stormwater discharge to the Colorado Department of Public Health and Environment, Water Quality Division. The application contains certification of completion of a stormwater management plan (SWMP), of which this grading and erosion control plan may be a part. For information or application materials contact:

Colorado Department of Public Health and Environment Water Quality Control Division
WQCD – Permits
4300 Cherry Creek Drive South Denver,
CO 80246-1530
Attn: Permits Unit

SECTION 4: WASTE MANAGEMENT PLAN

4.1 Covering Outdoor Storage and Handling Areas

Covering Outdoor Storage and Handling Areas

Permanent

Temporary

Description: When raw materials, byproducts, finished products, storage tanks, and other materials are stored or handled outdoors, stormwater runoff that comes in contact with the materials can become contaminated. Proactively covering storage and handling areas can be an effective source control for such areas. Coverings can be permanent or temporary and consist of tarp, plastic sheeting, roofing, enclosed structures, or other approaches that reduce exposure of materials to precipitation and wind.

Uses: Covering is appropriate for areas where solids (e.g., gravel, compost, building materials) or liquids (e.g., oil, gas, tar) are stored, prepared, or transferred. Cover the following areas that are applicable to this construction site:

- **Loading and Unloading:** Loading and unloading operations usually take place at outside storage or staging area on the construction site. Materials may be spilled during transfer between storage facilities and trucks during pumping of liquids, pneumatic transfer of dry chemicals, and mechanical transfer of bags, boxes, drums, or other containers by material handling equipment.
- **Aboveground Tanks/Liquid Storage:** Accidental releases of chemicals from above-ground liquid storage can contaminate stormwater with a variety of pollutants. Several common causes of accidental releases from above-ground storage include external corrosion and structural failure, problems due to improper installation, spills and overfills due to operator error, failure of piping systems, and leaks or spills during pumping of liquids or gases between trucks to a storage facility.
- **Outside Manufacturing:** Common outside manufacturing activities may include parts assembly, rock grinding or crushing, metals painting or coating, grinding, or sanding, degreasing, concrete manufacturing, parts cleaning, or operations that use hazardous materials. These activities can result in dry deposition of dust, metal and wood shavings and liquid discharges of dripping or leaking fluids from equipment or process and other residuals being washed away in storm runoff. In addition, outside storage of materials and waste products may occur in conjunction with outside manufacturing.
- **Waste Management:** Wastes spilled, leached, or lost from outdoor waste management areas or outside manufacturing activities may accumulate in soils or on other surfaces and be carried away by storm runoff. There is also the potential for liquid wastes from surface impoundments to overflow to surface waters or soak the soil where they can be picked up by runoff. Possible stormwater contaminants include toxic compounds, oil and grease, oxygen-demanding organics, paints and solvents, heavy metals, and high levels of suspended solids. Lack of coverage of waste receptacles can result in precipitation seeping through the material and collecting contaminants or the material being blown around the site and into the storm sewer system. Containment sources include waste

piles, wastewater and solid waste treatment and disposal, land application sites, dumpsters, or unlabeled drums.

- **Outside Storage of Materials:** Raw materials, intermediate products, byproducts, process residuals, finished products, containers, and materials storage areas can be sources of pollutants such as metals, oils and grease, sediment, and other contaminants. Pollutant transport can occur when solid materials wash off or dissolve into water, or when spills or leaks occur.

Practice Procedures:

- Where practical, conduct operations indoors. If outdoors, then select a temporary or permanent covering to reduce exposure of materials to precipitation and runoff.
- The type of covering selected depends on a variety of factors such as the type and size of activity being conducted, and materials involved. Types of cover range from relatively inexpensive tarps and plastic sheeting to overhead structures or fully enclosed buildings equipped with ventilation, lighting, etc.
- Covering practices should be combined with Good Housekeeping to be most effective.
- Tarps and plastic sheets require more frequent inspection and maintenance.

4.2 Spill Prevention and Response Plan

Spill Prevention & Response Plan

Permanent

Temporary

Spills and leaks of solid and liquid materials processed, handled, or stored outdoors can be a source of stormwater pollution. Spilled substances can reach receiving waters when runoff washes these materials from impervious surfaces or when spills directly enter the storm system during dry weather conditions. Effective controls depend on spill prevention and response measures, proper training, and may include structural spill containment or control devices. Spill containment measures include temporary or permanent curbs or berms that surround a potential spill site. Berms may be constructed of concrete, earthen material, metal, synthetic liners, or other material. Spill control devices include valves, slide gates, or other devices that can control and contain spilled material.

Spill Prevention Measures:

- Train key employees in plan and provide clear, common-sense spill prevention practices and clean-up procedures to be strictly followed.
- Identify equipment that is exposed to precipitation, pollutants that may be generated and possible sources of leaks or discharges.
- Portable toilets will be located a minimum of 10ft from stormwater inlets and 50ft 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.

- Perform inspections and preventative maintenance of equipment for proper operation and to check for leaks or evidence of discharge (stains). Ensure repairs are completed or provide temporary leak containment until such repairs can be made.
- Drain used motor oil and other automotive fluids in a designated area away from storm inlets. Collect spent fluids and recycle or dispose of them properly. Never dispose of it into storm or sanitary sewer.
- In fueling areas, clean up spills with dry methods (absorbents) and use damp cloths on gas pumps and damp mops on paved surfaces.
- Never hose down a spill or absorbent materials into the storm drain, or down into an interior floor drain which leads to the sanitary sewer system.
- Reduce stormwater contact with equipment and materials by implementing covered storage, reduce stormwater run-on and follow good housekeeping practices.
- Post signs at critical locations with Spill Prevention and Response Plan information.

Identification of Spill Areas: Spill prevention and response measures shall be implemented at construction sites in areas where materials may be spilled in quantities that can adversely impact receiving waters or the storm system. Identify potential spill areas, potential spill volumes, material types, frequency of material used, and drainage paths from spill areas with relation to storm sewer inlets, adjacent water bodies, structural CMs, and containment structures. Use this information to determine the types of spill prevention and control measures needed specific to the site conditions. Show the potential spill areas on the EC Plan:

- Loading and unloading areas
- Outdoor storage areas
- Outdoor manufacturing or processing activities
- Waste disposal
- Areas that generate significant dust or particulates that may later deposit on the ground
- Areas prone to spills based on past experience at the site
- Locations where other routine maintenance activities occur
- Areas where smaller leaks may occur (parking lots)

Material Handling Procedures: From a water quality perspective, the primary principle behind effective material handling practices is to minimize exposure to precipitation. Store the material indoors, otherwise implement the following outdoor materials handling procedures:

- Divert stormwater around materials storage areas.

- Keep bulk solid materials (raw materials, sand, gravel, topsoil, compost, concrete, packing materials, metal products, etc.) covered and protected from stormwater.
- When practical, store materials on impermeable surfaces.
- Store hazardous materials according to federal, state, and local requirements.
- Adopt procedures to reduce spills or leaks during filling or transfer of materials.
- Substitute less toxic or nontoxic materials for toxic materials.
- Store containers that are easily punctured or damaged away from high traffic areas.
- Add waste-capture containers such as collection pans for lubricating fluids.
- Store drums and containers with liquids on impermeable surfaces and provide secondary containment. Place drums stored outdoors on pallets to minimize contact with runoff.

Spill Response Procedures: Tailor spill response procedures to site-specific conditions and industry-specific regulatory requirements. Follow procedures:

- Contain and cleanup spills promptly after the spill is discovered.
- Sweep up small quantities of pollutants to reduce exposure to runoff.
- Place absorbents at fueling areas or areas susceptible to spills.
- Wipe up small spills with a rag, store rags in appropriate containers, dispose of rags properly or use a professional industrial cleaning service.
- Contain medium-sized spills with absorbents and use berms or absorbent "snakes" as temporary booms for the spill. Store and dispose of absorbents properly. Wet/dry vacuums may be used, but not for volatile fluids.
- Install drip pans below minor equipment leaks until a repair can be made.
- For large spills, first contain the spill and plug storm inlet where the liquid may migrate off-site, then clean up the spill.
- Excavation of spill areas to removed contaminated material may be required where large liquid spills occur on unpaved surfaces.
- Maintain an inventory of cleanup materials onsite and strategically locate them based on the types and quantities of chemicals present.
- Records of spills, leaks, or overflows that result in the discharge of pollutants must be documented and maintained.

Two approaches are used when implementing spill containment measures: 1) Design system to contain the entire spill; or 2) Use curbing to route spilled material to a collection basin. Both

containment berming and curbing should be sized to safely contain or convey to a collection basin a spill from the largest storage tank, tanker truck, or other containment device in the possible spill area. The spill containment area must have an impermeable surface (impermeable liner, asphalt, or concrete) to prevent groundwater contamination. Design containment system to enable collection and removal of spilled material through a pump or vacuum trucks, sorbent, or gelling material, etc. Material removed must be disposed of or recycled according to local, state, and federal standards. If the capacity of the spill containment is exceeded, supplemental measures should be available such as a portable containment device, sorbent materials, or gelling agents to solidify the material. Water that collects within containment areas due to rainfall or snowmelt must be appropriately treated before release from the spill area.

Emergency 24-Hour Site Contact (with spill response and clean-up authority):

Company Name: (TBD after the project is awarded for construction)

Contact Name: _____

Office #: _____ Cell #: _____ Email: _____

Notification Procedures: Some spills may need to be reported to the State of Colorado, Water Quality Control Division and Adams County Stormwater Division immediately upon discovery. Releases of chemical, oil, petroleum product, sewage, etc., which may enter State Waters must be reported to: State of Colorado, 24-hour Emergency Spill Reporting Line: 1-877-518-5608. <https://www.colorado.gov/pacific/cdphe/wq-environmental-spills>.
Tri-County Health Department: 303-220-9200.

4.3 Good Housekeeping

Good Housekeeping Practices

Permanent ***Temporary***

Description: Good housekeeping practices are designed to maintain a clean and orderly work environment. The most effective first steps towards preventing stormwater pollution at construction sites simply involve using common sense to improve the site's basic housekeeping methods. Poor housekeeping practices result in increased waste and potential for stormwater contamination. A clean and orderly work site reduces the possibility of accidental spills caused by mishandling of chemicals and equipment and should reduce safety hazards to personnel. A well-maintained material and chemical storage area will reduce the possibility of stormwater mixing with pollutants. Some simple procedures a site can use to promote good housekeeping include improved operation and maintenance of machinery and processes, material storage practices, material inventory controls, routine, and regular clean-up schedules, maintaining well organized work areas, signage, and educational program for employees and the general public.

Practice Procedures for Operation and Maintenance:

- Maintain dry and clean floors and ground surfaces by using brooms, shovels, vacuums, or cleaning machines, rather than wet clean-up methods.
- Regularly collect and dispose of garbage and waste material.
- Routinely inspect equipment to ensure that it is functioning properly without leaking and conduct preventative maintenance and needed repairs.

- Train employees on proper clean up and spill response procedures.
- Designate separate areas for auto parking, vehicle refueling and routine maintenance.
- Promptly clean up leaks, drips, and other spills.
- Cover and maintain dumpsters and waste receptacles. Add additional dumpsters or increase frequency of waste collection if overflowing conditions reoccur.
- For outdoor painting and sanding: Conduct activities in designated areas that provide adequate protection to prevent overspray and uncontrolled emissions. All operations should be conducted on paved surfaces to facilitate cleanup. Use portable containment as necessary for outside operations. Clean up and properly dispose of excess paint, paint chips, protective coatings, grit waste, etc.
- Maintain vegetation on facility grounds in a manner that minimizes erosion. Follow the Landscape Maintenance and Pesticide, Herbicide and Fertilizer Usage CMs to ensure that minimum amounts of chemicals needed for healthy vegetation are applied to minimize transport of these materials in runoff.

Practice Procedures for Material Storage Practices:

- Provide adequate aisle space to facilitate material transfer and access for inspection.
- Store containers, drums, and bags away from direct traffic routes to reduce container damage resulting in accidental spills.
- Stack containers according to manufacturer's instructions to avoid damaging the containers from improper weight distribution. Also store materials in accordance with directions in Safety Data Sheets (SDSs).
- Store containers on pallets or similar devices to prevent corrosion of containers that results from containers coming in contact with moisture on the ground.
- Store toxic or hazardous liquids within curbed areas or secondary containers.

Practice Procedures for Material Inventory Practices: An up-to-date materials inventory can keep material costs down by preventing overstocking, track how materials are stored and handled onsite, and identify which materials and activities pose the most risk to the environment. Assign responsibility of hazardous material inventory to individuals trained to handle such materials. A material inventory should include these steps:

- Identify all chemical substances present at work site. Perform a walk-through of the site, review purchase orders, list all chemical substances used and obtain Safety Data Sheets (SDS) for all chemicals.
- Label all containers with name and type of substance, stock number, expiration date, health hazards, handling suggestions, and first aid information. Find info on the SDS.
- Clearly identify special handling, storage, use and disposal considerations for hazardous materials on the material inventory.
- Institute a shelf-life program to improve material tracking and inventory to reduce the number of materials overstocked and ensure proper disposal of expired materials. Careful tracking of materials ordered can result in more efficient materials use. Decisions on the

amounts of hazardous materials that are stored on site should include an evaluation-of any emergency control systems that are in place. All storage areas for hazardous materials should be designed to contain spills.

Practice Procedures for Training and Participation: Provide frequent and proper training in good housekeeping techniques to reduce mishandling of chemicals or equipment. Educate by:

- Discussing good housekeeping practices in training programs and meetings.
- Publicizing pollution prevention concepts through posters or signs.
- Posting bulletin boards with updated good housekeeping procedures and tips.

4.4 Vehicle Maintenance, Fueling and Storage

Vehicle Maintenance, Fueling and Storage

Permanent

Temporary

Description: Areas where vehicles are fueled, maintained, and stored/parked can be pollutant "hot spots" that can result in hydrocarbons, trace metals, and other pollutants being transported in precipitation runoff. Proper fueling operations, storage of automotive fluids and effective spill cleanup procedures can help reduce contamination of stormwater runoff from vehicle maintenance and fueling facilities. Fuel-related spills can occur due to lack of attention during fueling or "topping off" fuel tanks. Common activities at construction sites include vehicle fluid replacement and equipment replacement and repair. Some of the wastes generated by maintaining automobiles include solvents (degreasers, paint thinners, etc.), antifreeze, brake fluid, brake pad dust, battery acid, motor oil, fuel, and lubricating grease.

Uses: procedures are applicable to vehicle maintenance and fueling. Vehicle wash water is considered process wastewater that will not be discharged to the storm sewer system.

Practice Procedures for Vehicle Maintenance: The most effective way to minimize wastes generated by automotive maintenance activities is to prevent their production in the first place. The following practices will be implemented:

- Perform maintenance activities inside or under cover. When repairs cannot be performed indoors, use drip pans or absorbents.
- Keep equipment clean and free of excessive oil and grease buildup.
- Promptly cleanup spills using dry methods and properly dispose of waste. When water is required, use as little as possible to clean spills, leaks, and drips.
- Use a solvent collection service to collect spent solvents used for parts cleaning.
- When using liquids for cleaning, use a centralized station to ensure that solvents and residues stay in one area. Locate drip pans and draining boards to direct solvents back into a solvent sink or holding tank for reuse.
- Store used oil for recycling in labeled tanks. Locate used oil tanks and drums away from storm sewer, flowing streams, and preferably indoors.
- Use non-hazardous or less hazardous alternatives when practical. For example, replace chlorinated organic solvents with non-chlorinated ones like kerosene or mineral spirits.

- Properly recycle or dispose of grease, oil, antifreeze, brake fluid, cleaning solutions, hydraulic fluid, batteries, transmission fluid, worn parts, filters, and rags.
- Drain and crush oil filters before recycling or disposal.
- Drain all fluids and remove batteries from salvage vehicles and equipment.
- Closely monitor parked vehicles for leaks and place pans under leaks to collect the fluids for proper disposal or recycling.
- Install berms or other measures to contain spills and prevent work surface runoff from entering storm sewer system.
- Develop a spill prevention plan with measures such as spill kits, and information about location of storm drains and how to protect them if a large spill occurs.
- Conduct periodic employee training to reinforce proper disposal practices.
- Promptly transfer used fluids to recycling drums or hazardous waste containers.
- Store cracked batteries in leak-proof secondary containers.
- Inspect outdoor storage areas regularly for drips, spills, and improperly stored materials (for example: unlabeled containers, auto parts that might contain grease or fluids, etc.). This is particularly important for parking areas for vehicles awaiting repair.
- Structural CMs, such as traps, installed in vehicle hotspot areas require routine cleanout of oil and grease. During heavy rainfall, cleanout is required more often to ensure that pollutants are not washed through the trap. Sediment removal is also required on a regular basis to keep the CM working efficiently.

Practice Procedures for Vehicle Fueling:

- Fueling areas should be designed to prevent stormwater runoff and spills. Fuel-dispensing areas should be paved with concrete or equivalent impervious surface, with an adequate slope to prevent ponding, and separated from the rest of the site by a grade break or berm to prevent run-on of precipitation.
- For sites using a mobile fuel truck, establish a designated fueling area. Place temporary "caps" over nearby catch basins or manhole covers so that if a spill occurs, it is prevented from entering the storm sewer. Secondary containment should be used when transferring fuel from the tank truck to the fuel tank. Cover storm drains in the vicinity. Install vapor recovery nozzles to help control drips and reduce air pollution.
- Keep spill response information and spill cleanup materials onsite and readily available.
- Employ dry cleanup methods cleaning up fuel spills. Such methods include sweeping to remove litter and debris and using rags and absorbents for leaks and spills.
- Water should not be used to wash fuel spill areas. During routine cleaning, use a damp cloth on the pumps and a damp mop on the pavement. Fuel dispensing nozzles should be fitted with automatic shutoff except when prohibited by fire department. Post signs at the fuel dispenser warning operators against "topping off" vehicle fuel tanks.
- Provide written procedures describing CMs to employees who will be fueling.

4.5 Street Sweeping and Cleaning

Street Sweeping (SS)

Permanent

Temporary

Description: SS uses either manual or mechanical pavement cleaning practices to collect or vacuum sediment, litter, and other debris from the streets before being washed into storm sewers by runoff. This practice can reduce pollutant loading to receiving waters, reduce clogging of storm sewer pipes, prolong the life of infiltration CMs and reduce clogging of outlet structures in detention ponds. Mechanical designs include broom and conveyor belt sweeper, wet or dry vacuum-assisted sweepers, and regenerative-air sweepers. The effectiveness depends upon particle loadings being swept, street texture, moisture conditions, parked cars, equipment conditions and frequency of cleaning.

Uses: SS is a technique in urban areas where sediment and litter accumulated on streets is of concern for aesthetic, sanitary, water and air quality reasons. SS is required at construction sites per SWMP to reduce off-site tracking.

Procedures:

1. SS may be performed manually (broom and shovel) or with a vacuum sweeper (no kick-broom). Choose the most effective approach for site conditions.
2. SS shall be completed when there is sediment tracking from the construction site exits into the public road or right-of-way.
3. SS frequency depends on presence of sediment tracking. If tracking is occurring, either a VTC shall be installed, the VTC needs maintenance, or the VTC is inadequate; all require SWMP updates.
4. Off-site sediment tracking from the construction site shall be swept immediately.
5. Conduct SS prior to precipitation events.
6. Operate sweepers at manufacturer recommended optimal speed levels.
7. Regularly inspect vehicles and equipment for leaks and repair promptly.
8. Keep accurate logs of number of curb-miles swept and amount of waste collected.
9. Dispose of SS debris and dirt at a landfill.
10. Do not store swept material along the side of the street or near a storm drain inlet.

4.6 Storm Sewer Cleaning

Storm Sewer System Cleaning

Permanent

Temporary

Description: Periodic storm sewer cleaning can help remove accumulated sediment, trash, and other pollutants from the storm system including inlets, pipes and also construction CMs. Routine cleaning reduces the amount of pollutants in the storm system and in receiving waters. Clogged drains can cause overflow, leading to increased erosion. Cleaning increases dissolved oxygen, reduces levels of bacteria, and supports in-stream habitat. Areas with flat grades or low flows should be given special attention because they rarely achieve high enough flows to flush themselves. Water used in storm drain cleaning must be collected and properly disposed of, typically at a sanitary wastewater treatment facility. Simpler methods in localized areas can also include manual trash collection and shoveling sediment and debris from inlets and outlets. Frequency and prioritization of storm sewer cleaning is affected by the activity and intensity of construction and the proper installation and maintenance for construction CMs.

Uses: Inspection of the existing storm system is recommended prior construction to document condition. The storm sewer shall be cleaned at minimum at completion of construction.

Practice Guidelines: Inspect the storm system as part of the required stormwater inspection.

- **Technology available:** manual cleaning (shovel), vacuum cleaning and vacuum combination jet cleaning. Choose the most effective approach for site conditions.
- **Staff training:** training about maintenance, waste collection and disposal methods.
- **Waste disposal:** most catch basin waste is acceptable for landfills. If hazardous material is suspected, it should be tested and disposed of accordingly.

SECTION 5: STORMWATER INSPECTIONS

5.1 Inspections

1. *Qualified Stormwater Management Inspection Personnel:*

Identify the inspection person(s) who will be responsible for conducting stormwater inspections and describe their qualifications: (TBD)

Name: _____
Title: _____
Address: _____
Office #: _____ Cell #: _____ Email: _____

Qualifications:

2. *Inspection Frequency:*

Inspections shall start within 7 calendar days of commencement of construction activities.

Minimum Stormwater Inspection Schedule: A thorough inspection of the site inspection shall be performed in accordance with one of the following minimum frequencies:

- At least one inspection every 7 calendar days, **or**
- At least one inspection every 14 calendar days, if post-storm event inspections are conducted within 24 hours after the end of any precipitation or snowmelt event that causes surface erosion. Post-storm inspections may be used to fulfill the 14-day routine inspection requirement.

Post-Storm Inspections at Temporarily Idle Sites - For permittees choosing to combine 14-day inspections and post-storm-event inspections, if no construction activities will occur following a storm event, post-storm event inspections must be conducted prior to re-commencing construction activities, but no later than 72 hours following the storm event. The delay of any post-storm event inspection must be documented in the inspection record. Routine inspections must still be conducted at least every 14 calendar days.

Inspections at Completed Sites/Areas - When the site, or portions of a site are awaiting establishment of a vegetative ground cover and final stabilization, the permittee must conduct a thorough inspection of the stormwater management system at least once every 30 days. Post-storm event inspections are not required under this schedule. This reduced inspection schedule is allowed if all of the following criteria are met:

- i. All construction activities resulting in ground disturbance are complete;
- ii. All activities required for final stabilization, in accordance with the SWMP, have been completed, with the exception of the application of seed that has

not occurred due to seasonal conditions or the necessity for additional seed application to augment previous efforts; and

- iii. The SWMP has been amended to locate those areas to be inspected in accordance with the reduced schedule allowed for in this paragraph.

The minimum inspection frequency required does not affect the permittee's responsibility to implement and maintain effective control measures as prescribed in the SWMP. Proper maintenance may require more frequent inspections.

3. Inspection Procedures:

- At minimum, inspect the construction site perimeter, all disturbed area, designated haul routes, material and/or waste storage areas that are exposed to precipitation, discharge location(s), and locations where vehicles exit the site shall be inspected for evidence of, or the potential for, pollutants leaving the Permitted boundaries, entering the storm sewer system, or discharging to the MS4.
- Refer to **Section 5.2 Inspection Sequence**.
- Visually verify whether all implemented CMs are in effective operational condition and are working as designed in their specifications to minimize pollutant discharges.
- Determine if there are new potential sources of pollutants.
- Assess the adequacy of CMs at the site to identify areas requiring new or modified CMs to minimize pollutant discharges.
- Identify all areas of non-compliance and implement corrective action.

4. Correcting Problems:

Take steps to minimize the discharge of pollutants until a CM is implemented and operational, or an inadequate CM is replaced or corrected, and returned to effective operating condition. Remove and properly dispose of any unauthorized release or discharge. Clean up any contaminated surfaces to minimize discharges of the material in subsequent storm events. If it is infeasible to install or repair the CM immediately after discovering the deficiency, the following must be documented:

- (a) Describe why it is infeasible to initiate the installation or repair immediately; and
- (b) Provide a schedule for installing or repairing the CM and returning it to an effective operating condition asap.

Responsible staff or company for making corrections: (TBD)

Company/Organization: _____

Name: _____

Contact Information: _____

5. Inspection Form:

Use the form¹ in **Appendix 6** for all Capital Improvement Projects. Place completed inspections or refer to where the inspections are kept electronically in **Appendix 7**. At a minimum the form should document:

¹ An equivalent form may be used for all projects except Capital Improvement Projects.

- Inspection date;
- name & title of inspector;
- weather conditions;
- phase of construction;
- estimated acreage of disturbance at the time of inspection;
- location(s) of discharges of sediment or other pollutants from the site; location(s) of CMs needing maintenance;
- location(s) and identification of inadequate CMs;
- location(s) and identification of additional CMs needed that were not in place at the time of inspection;
- description of the minimum inspection frequency;
- deviations from the minimum inspection schedule; certification statement for corrective action(s) or inspection (if no actions).

5.2 Inspection Sequence

1. Plan your stormwater inspection

- Use the inspection form (or equivalent) under **Appendix 6**.
- Obtain a copy of the EC Plan (Site Map) with CMs locations marked.
- Plan to walk the entire site, including discharge points from the site and any off-site support activities.
- Follow a consistent pattern each time to ensure you inspect all areas.

2. Determine Inspection frequency

- Site inspections must be conducted at least once every 7 to 14 calendar days.
- If 14-day inspections, then post-storm inspections must be conducted within 24 hours after the end of any precipitation or snowmelt event that causes surface erosion.
- 30-day inspections are conducted once construction is complete, temporary stabilizations has been installed and the site is waiting to reach final stabilization.

3. Inspect discharge points and downstream, off-site areas

- Inspect discharge locations to determine whether erosion and sediment control measures are effective.
- Inspect nearby downstream locations.
- Walk down the street to inspect off-site areas for signs of discharges.
- Inspect down slope existing catch basins to ensure they are free of sediment and other pollutants and to ensure that they are adequately protected.

4. Inspect perimeter controls and slopes

- Inspect perimeter controls to determine if sediment should be removed.
- Check the structural integrity of the CM. Determine if CM replacement is needed.
- Inspect slopes and temporary stockpiles to determine if erosion controls are effective.

5. Compare CMs in the EC Plan with the construction site conditions.

- Determine whether CMs are in place as required by the EC plan.
- Evaluate whether CMs have been adequately installed and maintained.
- Look for areas where CMs are needed but are missing on the field or are not documented on the SWMP.

6. Inspect construction site entrances

- Inspect the construction exits to determine if there is tracking of sediment from the site onto the street.
- Refresh or replace the rock in designated entrances and concrete washout areas.
- Look for evidence of additional construction exits being used that are not in the SWMP or are not stabilized.
- Sweep the street if there is evidence of sediment accumulation.

7. Inspect sediment controls

- Inspect any sediment basins for sediment accumulation.
- Remove sediment when it reduces the capacity of the basin by $\frac{1}{3}$ of the design storage volume.

8. Inspect pollution prevention and good housekeeping practices

- Inspect trash areas to ensure that waste is properly contained.
- Inspect material storage and staging areas to verify that potential pollutant sources are not exposed to stormwater runoff.
- Verify that concrete, paint, and stucco washouts are being used properly and are correctly sized for the volume of wash water.
- Inspect vehicle/equipment fueling and maintenance areas for signs of stormwater pollutant exposure.

9. Inspect for final stabilization

- Inspect all temporary and permanent CMs for correct application and installation with the CM details.
- Remove sediment from the private storm sewer system - do not jet pollutants down into the public storm sewer system.

SECTION 6: RECORDKEEPING

6.1 Recordkeeping

The following records shall be available at the construction site, or be on-site when construction activities are occurring:

- ✓ An updated SWMP, reflecting current conditions and CMs.
- ✓ Location of SWMP records to be determined at Preconstruction Meeting.
- ✓ Keep record of SWMP/EC Plan changes made including the date and identification of the changes (*).
- ✓ Completed inspection reports, can be placed, or electronically stored and the location referenced in **Appendix 7**
- ✓ Inspection Logs shall include signatures of inspectors.
- ✓ Any document or plan incorporated by reference to the SWMP.

(*) The SWMP must be amended when the following occurs:

- 1) A change in design, construction, operation, or maintenance of the site requiring implementation of new or revised control measures;
- 2) The SWMP proves ineffective in controlling pollutants in stormwater runoff in compliance with the permit conditions;
- 3) Control measures identified in the SWMP are no longer necessary and are removed; and
- 4) Corrective actions are taken onsite that result in a change to the SWMP.

A notation must be included in the SWMP to identify the date of the site change, the control measure removed, or modified, the location(s) of those control measures, and any changes to the control measure(s). The permittee must ensure the site changes are reflected in the SWMP. The permittee is non-compliant with the permit until the SWMP revisions have been made.

SWMP documentation required under this permit are considered reports that must be available to the public under Section 308(b) of the CWA and Section 61.5(4) of the CDPS regulations. The permittee must make plans available to members of the public upon request. However, the permittee may claim any portion of a SWMP as confidential in accordance with 40 CFR Part 2.

Records will be retained for a minimum period of at least 3 years after the CDPHE permit is terminated.

SECTION 7: FINAL STABILIZATION

7.1 Final Stabilization Requirement

Final Stabilization is reached when all ground disturbing activities are complete, and all disturbed areas have either been built on, paved over or a uniform vegetative cover has been established per SWMP. Prior to closing the State Stormwater Permit, all the items listed below must be completed in order for the construction site to be considered to have final stabilization.

1. The site has a uniform vegetative cover with a density of at least 70% compared to the original undisturbed site. Such cover must be capable of adequately controlling soil erosion.
2. If applicable, proper installation and maintenance of all approved, permanent, post-construction stormwater quality treatment drainage facilities.
3. Removal of all stockpiles of soil, construction material/debris, construction equipment, etc. from the construction site.
4. Streets, parking lots, and other surrounding paved surfaces are clean and free of any sediment or debris.
5. Removal of sediment, debris, or other pollutants within the private and adjacent public storm drainage system.
6. Restoration of any damaged public infrastructure caused by the construction activities.

7.2 Final Stabilization Measures

Final stabilization measures shall be installed per Erosion Control Details (**Appendix 4**).

7.3 Removal of Temporary CMs

Once the site has met the final stabilization conditions, the remaining temporary CMs such as perimeter controls, inlet protection, silt fence, etc. shall be removed and disposed of properly.

7.4 Stormwater Permits Close-out

Submit the CDPS Stormwater Discharge Permit Inactivation Form to CDPHE.

7.5 Long Term Stormwater Management

The existing pond footprint remains unchanged and is to remain with its current ownership and is to follow the latest O&M Manuel.

SWMP APPENDICES

<i>Appendix 1 - Project Vicinity Map</i>	<i>(Section 1.1)</i>
<i>Appendix 3 - Pre-disturbance Photos</i>	<i>(Section 1.4)</i>
<i>Appendix 4 - Erosion and Sediment BMPs/CMs Details</i>	<i>(Section 1.10)</i>
<i>Appendix 5 - Erosion and Sediment Control Plan (ESC Plan) - Site Map</i>	<i>(Section 2.10)</i>
<i>Appendix 6 - Stormwater Inspection Form</i>	<i>(Section 5.1)</i>
<i>Appendix 7 - Completed Stormwater Inspection Logs</i>	<i>(Sections 5.3 & 5.5)</i>

APPENDIX 1: Project Vicinity Map

PROJECT LOCATION



VICINITY MAP

1" = 2000 FEET

APPENDIX 3: Pre-Disturbance Photos







APPENDIX 4: Erosion & Sediment CMs/BMPs Details

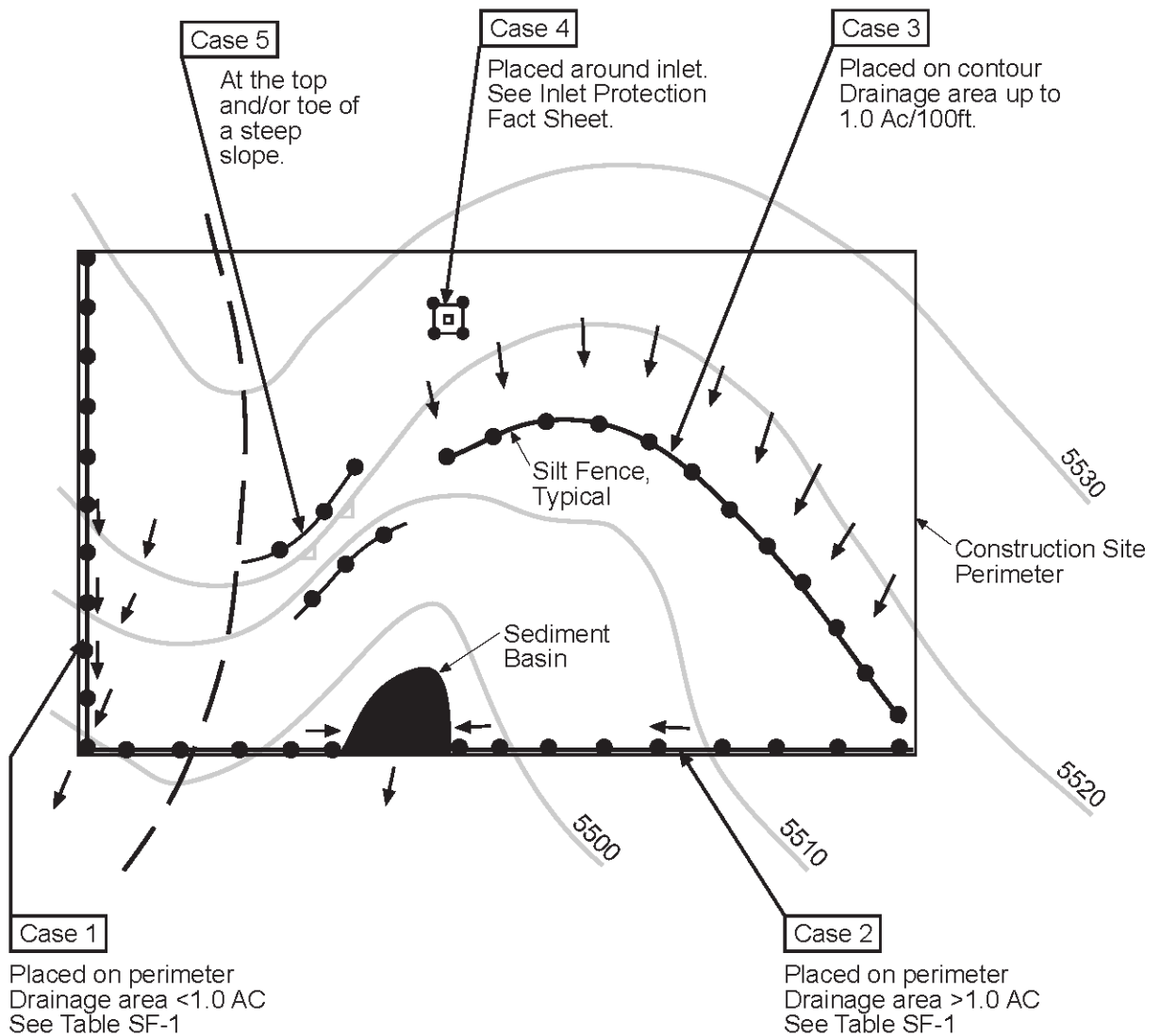


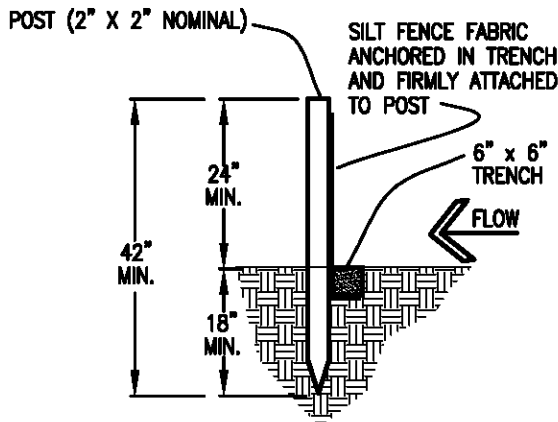
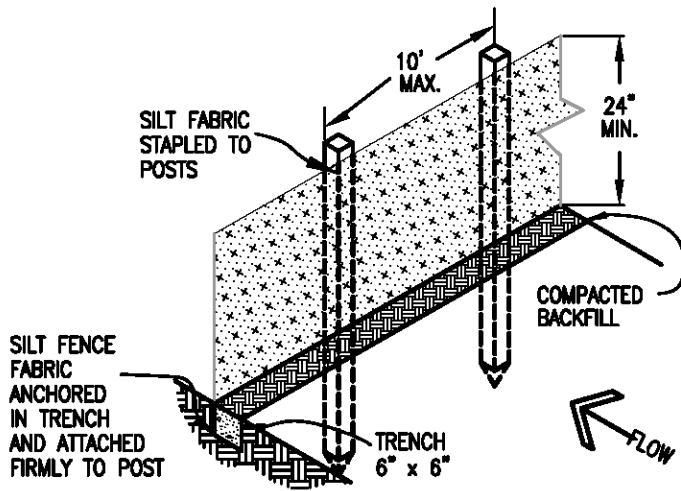
Table SF-1

Silt Fence Used as Perimeter Control	Case 1		Case 2 DA > 1.0 AC
	DA < 0.25 AC	0.25 < DA < 1 AC	
Continuous Grade	OK ⁽¹⁾	OK ⁽¹⁾	OK ⁽¹⁾
Area of Concentrated Flow	OK	NO ⁽²⁾	NO ⁽³⁾

(1) Temporary Swale or Straw Bale Barrier may be used as alternative to a Silt Fence.

(2) Check Dam may also be used as alternative to Silt Fence at low point.

(3) Sediment Basin is required for concentrated flow from drainage areas > 1.0 AC.



SILT FENCE

SILT FENCE NOTES

INSTALLATION REQUIREMENTS

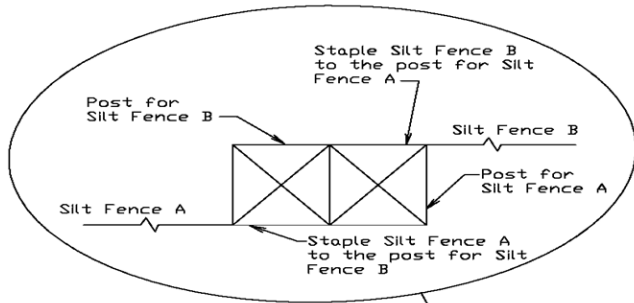
1. SILT FENCES SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.
2. WHEN JOINTS ARE NECESSARY, SILT FENCE GEOTEXTILE SHALL BE SPLICED TOGETHER ONLY AT SUPPORT POST AND SECURELY SEALED.
3. METAL POSTS SHALL BE "STUDDED TEE" OR "U" TYPE WITH MINIMUM WEIGHT OF 1.33 POUNDS PER LINEAR FOOT. WOOD POSTS SHALL HAVE A MINIMUM DIAMETER OR CROSS SECTION DIMENSION OF 2 INCHES.
4. THE FILTER MATERIAL SHALL BE FASTENED SECURELY TO METAL OR WOOD POSTS USING WIRE TIES, OR TO WOOD POSTS WITH 3/4" LONG #9 HEAVY-DUTY STAPLES. THE SILT FENCE GEOTEXTILE SHALL NOT BE STAPLED TO EXISTING TREES.
5. WHILE NOT REQUIRED, WIRE MESH FENCE MAY BE USED TO SUPPORT THE GEOTEXTILE. WIRE FENCE SHALL BE FASTENED SECURELY TO THE UPSLOPE SIDE OF THE POSTS USING HEAVY-DUTY WIRE STAPLES AT LEAST 3/4" LONG, TIE WIRES OR HOG RINGS. THE WIRE SHALL EXTEND INTO THE TRENCH A MINIMUM OF 6" AND SHALL NOT EXTEND MORE THAN 3' ABOVE THE ORIGINAL GROUND SURFACE.

6. ALONG THE TOE OF FILLS, INSTALL THE SILT FENCE ALONG A LEVEL CONTOUR AND PROVIDE AN AREA BEHIND THE FENCE FOR RUNOFF TO POND AND SEDIMENT TO SETTLE. A MINIMUM DISTANCE OF 5 FEET FROM THE TOE OF THE FILL IS RECOMMENDED.
7. THE HEIGHT OF THE SILT FENCE FROM THE GROUND SURFACE SHALL BE MINIMUM OF 24 INCHES AND SHALL NOT EXCEED 36 INCHES; HIGHER FENCES MAY INPOUND VOLUMES OF WATER SUFFICIENT TO CAUSE FAILURE OF THE STRUCTURE.

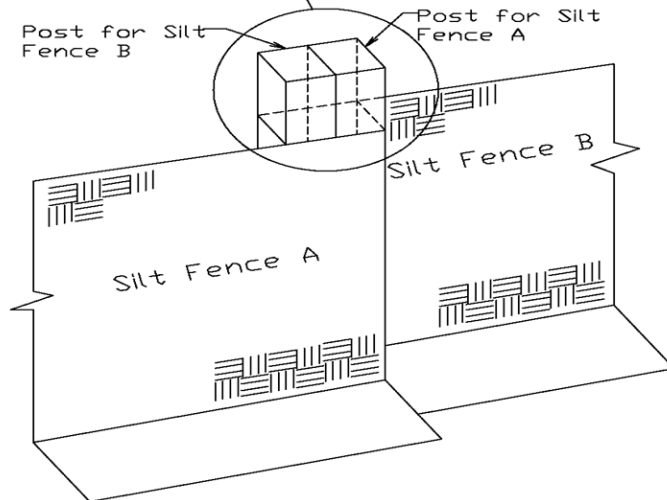
MAINTENANCE REQUIREMENTS

1. CONTRACTOR SHALL INSPECT SILT FENCES IMMEDIATELY AFTER EACH RAINFALL, AT LEAST DAILY DURING PROLONGED RAINFALL, AND WEEKLY DURING PERIODS OF NO RAINFALL. DAMAGED, COLLAPSED, UNENTRENCHED OR INEFFECTIVE SILT FENCES SHALL BE PROMPTLY REPAIRED OR REPLACED.
2. SEDIMENT SHALL BE REMOVED FROM BEHIND SILT FENCE WHEN IT ACCUMULATES TO HALF THE EXPOSED GEOTEXTILE HEIGHT.
3. SILT FENCES SHALL BE REMOVED WHEN ADEQUATE VEGETATIVE COVER IS ATTAINED AS APPROVED BY THE CITY.

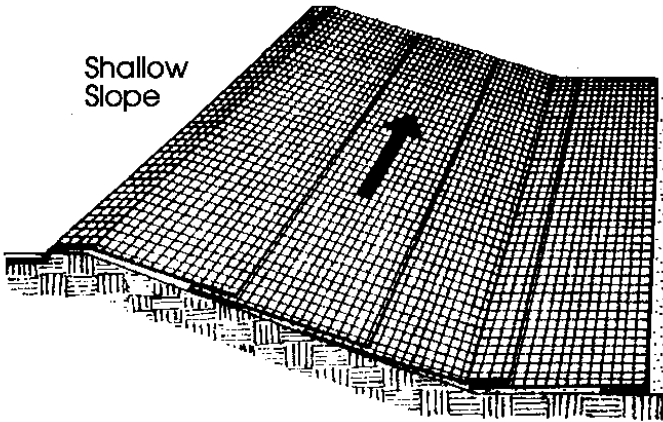
Top View of Silt Fence Posts Detail



Refer to "Top View of Silt Fence Posts Detail"



Shallow Slope

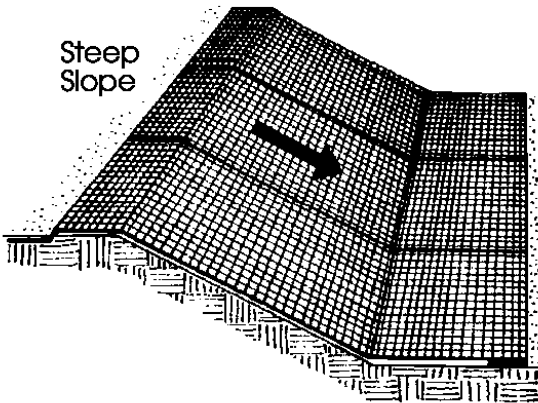


On shallow slopes, strips of netting may be applied across the slope.

Where there is a berm at the top of the slope, bring the netting over the berm and anchor it behind the berm.

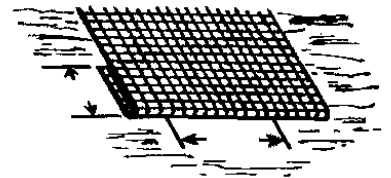


Steep Slope

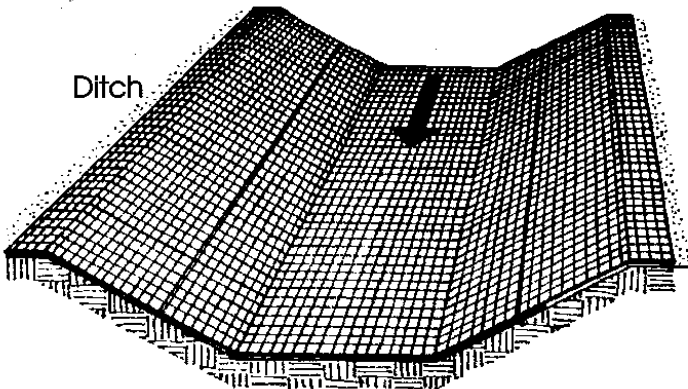


On steep slopes, apply strips of netting parallel to the direction of flow and anchor securely.

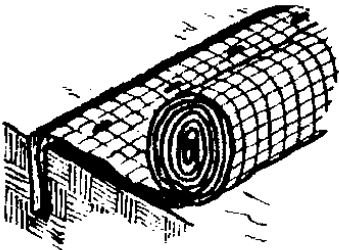
Bring netting down to a level area before terminating the installation. Turn the end under 6" and staple at 12" intervals.



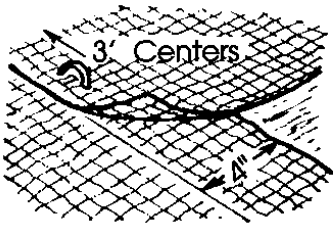
Ditch



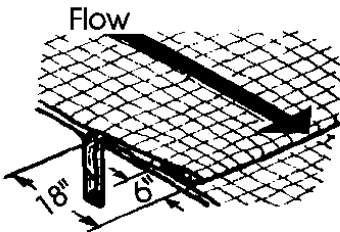
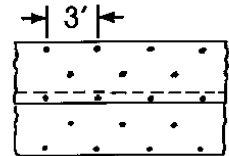
In ditches, apply netting parallel to the direction of flow. Use check slots every 15 feet. Do not join strips in the center of the ditch.



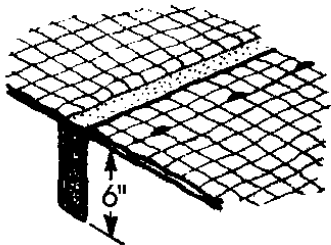
Anchor Slot: Bury the up-channel end of the net in a 6" deep trench. Tamp the soil firmly. Staple at 12" intervals across the net.



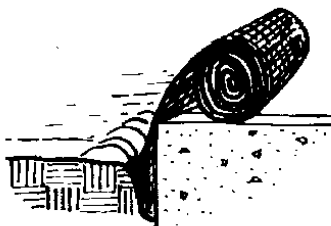
Overlap: Overlap edges of the strips at least 4". Staple every 3 feet down the center of the strip.



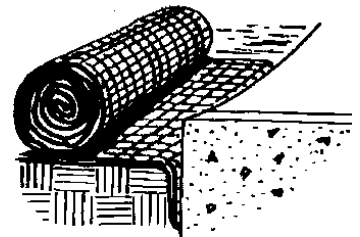
Joining Strips: Insert the new roll of net in a trench, as with the Anchor Slot. Overlap the up-channel end of the previous roll 18" and turn the end under 6". Staple the end of the previous roll just below the anchor slot and at the end at 12" intervals.

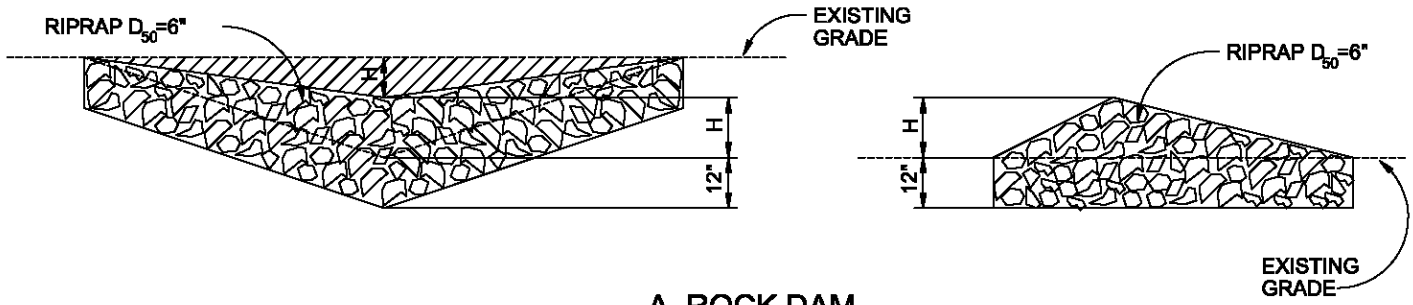


Check Slots: On erodible soils or steep slopes, check slots should be made every 15 feet. Insert a fold of the net into a 6" trench and tamp firmly. Staple at 12" intervals across the net. Lay the net smoothly on the surface of the soil - do not stretch the net, and do not allow wrinkles.

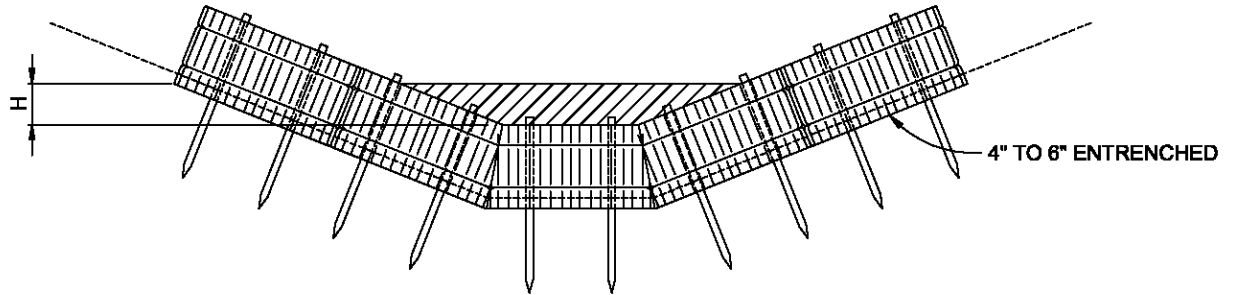


Anchoring Ends At Structures: Place the end of the net in a 6" slot on the up-channel side of the structure. Fill the trench and tamp firmly. Roll the net up the channel. Place staples at 12" intervals along the anchor end of the net.

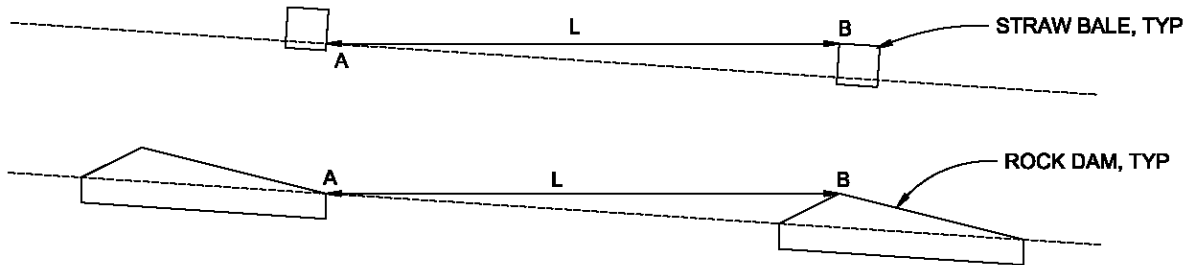




A. ROCK DAM



B. STRAW BALE CHECK DAM
(SEE STRAW BALE BARRIER INSTALATION)



L= THE DISTANCE SUCH THAT POINTS A AND B ARE AT THE SAME ELEVATION.

C. SPACING CHECK DAMS

CHECK DAM

NTS

CHECK DAM NOTES

INSTALLATION REQUIREMENTS

1. STRAW BALES USED AS CHECK DAMS ARE TO MEET THE REQUIREMENTS STATED IN FIGURE SBB-2.
2. THE "H" DIMENSION SHALL BE SELECTED TO PROVIDE WEIR FLOW CONVEYANCE FOR 2-YEAR FLOW OR GREATER.

MAINTENANCE REQUIREMENTS

1. REGULAR INSPECTIONS ARE TO BE MADE OF ALL CHECK DAMS, ESPECIALLY AFTER STORM EVENTS.
2. REPLACE STONE AS NECESSARY TO MAINTAIN THE CORRECT HEIGHT OF THE DAM.
3. ACCUMULATED SEDIMENT AND DEBRIS IS TO BE REMOVED FROM BEHIND THE DAMS AFTER EACH STORM OR WHEN 1/2 OF THE ORIGINAL HEIGHT OF THE DAM IS REACHED.
3. CHECK DAMS ARE TO REMAIN IN PLACE AND OPERATIONAL UNTIL THE DRAINAGE AREA AND CHANNEL ARE PERMANENTLY STABILIZED.
4. WHEN CHECK DAMS ARE REMOVED THE CHANNEL LINING OR VEGETATION IS TO BE RESTORED.

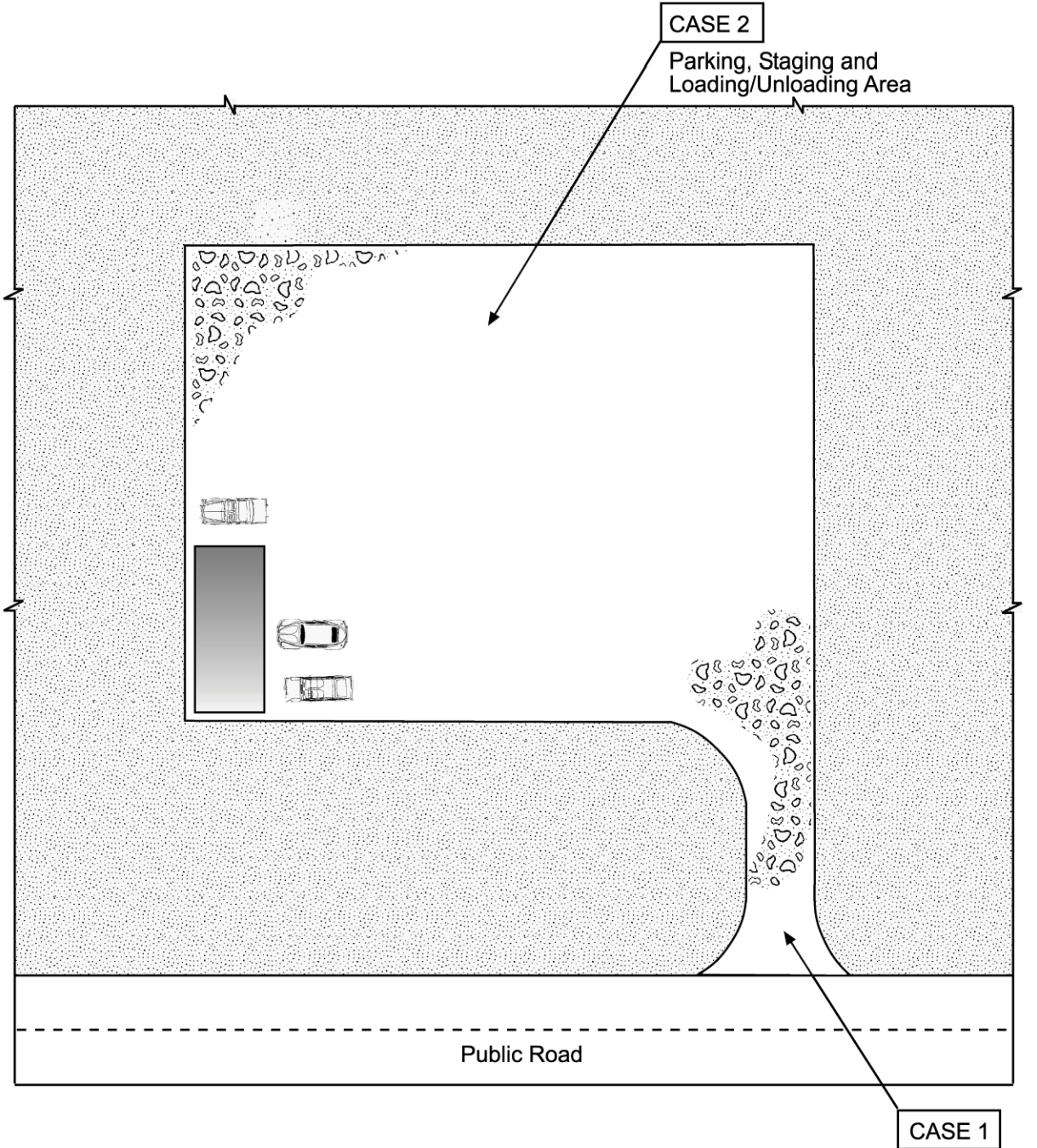
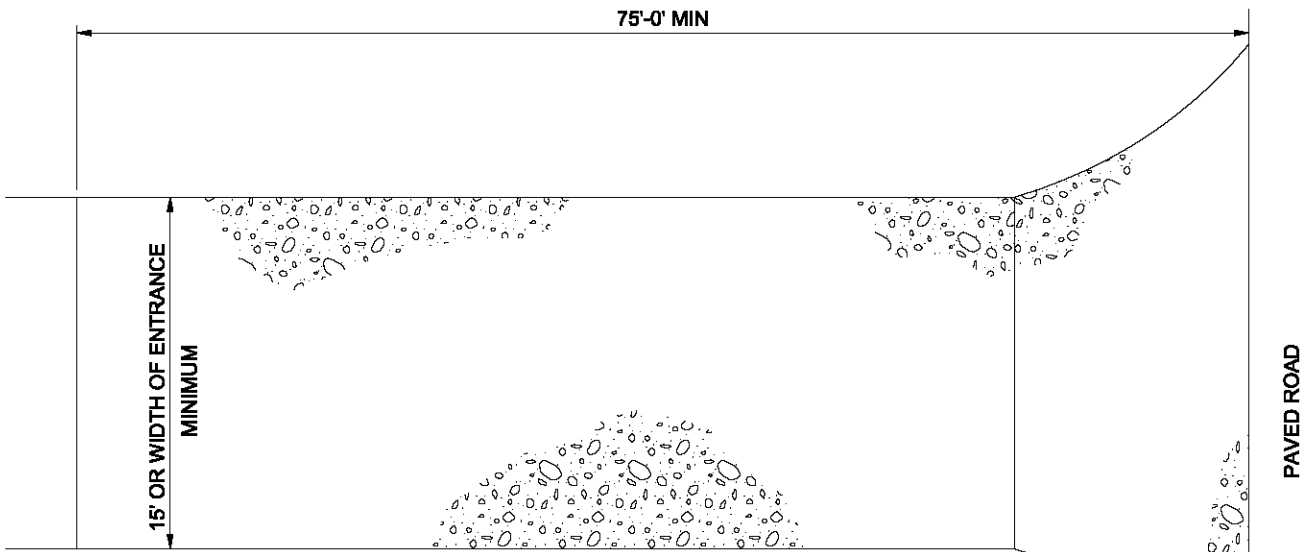


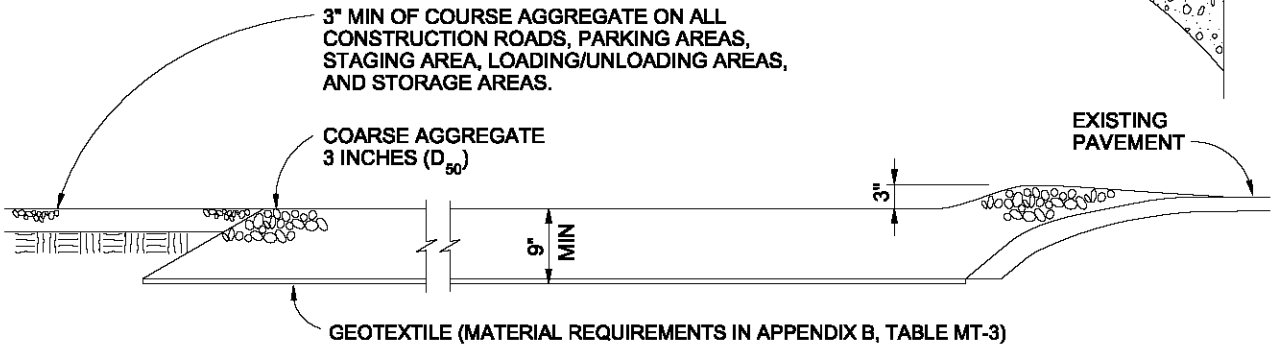
Table VT-1

	Case 1	Case 2
Gravel Thickness	9"	3"
Filter Fabric	YES	NO

CASE 1
Construction Entrance



PLAN



SECTION

VEHICLE TRACKING

NTS

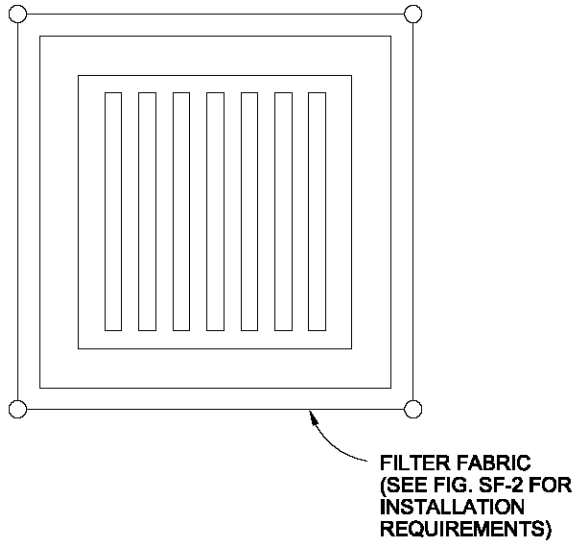
VEHICLE TRACKING NOTES

INSTALLATION REQUIREMENTS

1. ALL ENTRANCES TO THE CONSTRUCTION SITE ARE TO BE STABILIZED PRIOR TO CONSTRUCTION BEGINNING.
2. CONSTRUCTION ENTRANCES ARE TO BE BUILT WITH AN APRON TO ALLOW FOR TURNING TRAFFIC, BUT SHOULD NOT BE BUILT OVER EXISTING PAVEMENT EXCEPT FOR A SLIGHT OVERLAP.
3. AREAS TO BE STABILIZED ARE TO BE PROPERLY GRADED AND COMPACTED PRIOR TO LAYING DOWN GEOTEXTILE AND STONE.
4. CONSTRUCTION ROADS, PARKING AREAS, LOADING/UNLOADING ZONES, STORAGE AREAS, AND STAGING AREAS ARE TO BE STABILIZED.
5. CONSTRUCTION ROADS ARE TO BE BUILT TO CONFORM TO SITE GRADES, BUT SHOULD NOT HAVE SIDE SLOPES OR ROAD GRADES THAT ARE EXCESSIVELY STEEP.

MAINTENANCE REQUIREMENTS

1. REGULAR INSPECTIONS ARE TO BE MADE OF ALL STABILIZED AREAS, ESPECIALLY AFTER STORM EVENTS.
2. STONES ARE TO BE REAPPLIED PERIODICALLY AND WHEN REPAIR IS NECESSARY.
3. SEDIMENT TRACKED ONTO PAVED ROADS IS TO BE REMOVED DAILY BY SHOVELING OR SWEEPING. SEDIMENT IS NOT TO BE WASHED DOWN STORM SEWER DRAINS.
4. STORM SEWER INLET PROTECTION IS TO BE IN PLACE, INSPECTED, AND CLEANED IF NECESSARY.
5. OTHER ASSOCIATED SEDIMENT CONTROL MEASURES ARE TO BE INSPECTED TO ENSURE GOOD WORKING CONDITION.



FILTER FABRIC INLET PROTECTION

NTS

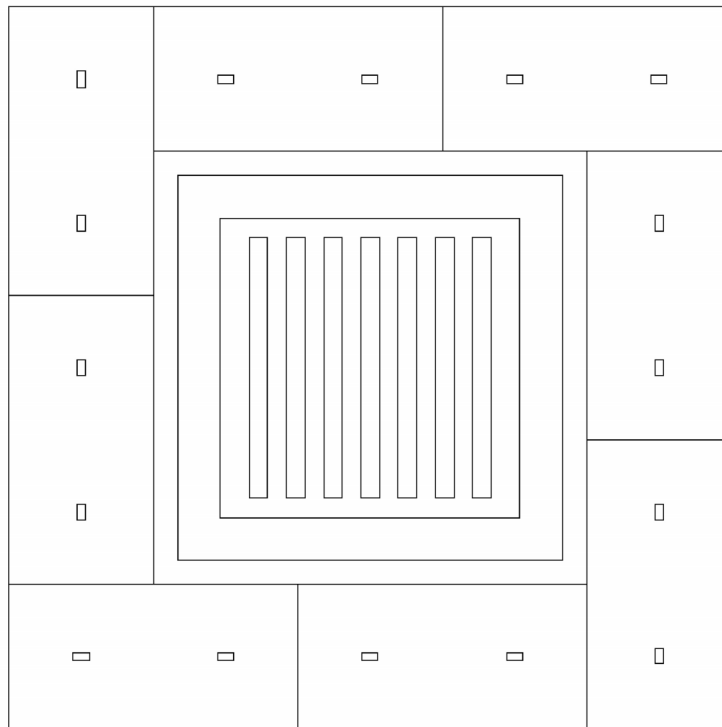
FILTER FABRIC INLET PROTECTION NOTES

INSTALLATION REQUIREMENTS

1. INLET PROTECTION SHALL BE INSTALLED IMMEDIATELY AFTER CONSTRUCTION OF INLET.
2. SEE SILT FENCE FIGURE SF-2 FOR INSTALLATION REQUIREMENTS.
3. POSTS ARE TO BE PLACED AT EACH CORNER OF THE INLET AND AROUND THE EDGES AT A MAXIMUM SPACING OF 3 FEET.

MAINTENANCE REQUIREMENTS

1. CONTRACTOR SHALL INSPECT INLET PROTECTION IMMEDIATELY AFTER EACH RAINFALL, AT LEAST DAILY DURING PROLONGED RAINFALL, AND WEEKLY DURING PERIODS NO RAINFALL.
2. DAMAGED, COLLAPSED, UNENTRENCHED OR INEFFECTIVE INLET PROTECTION SHALL BE PROMPTLY REPAIRED OR REPLACED.
3. SEDIMENT SHALL BE REMOVED FROM BEHIND FILTER FABRIC WHEN IT ACCUMULATES TO HALF THE EXPOSED GEOTEXTILE HEIGHT.
4. FILTER FABRIC PROTECTION SHALL BE REMOVED WHEN ADEQUATE VEGETATIVE COVER IS ATTAINED IN THE DRAINAGE AREA AS APPROVED BY THE CITY.



STRAW BALE
(SEE FIG. SBB-2
FOR INSTALLATION
REQUIREMENTS)

STRAW BALE INLET PROTECTION

NTS

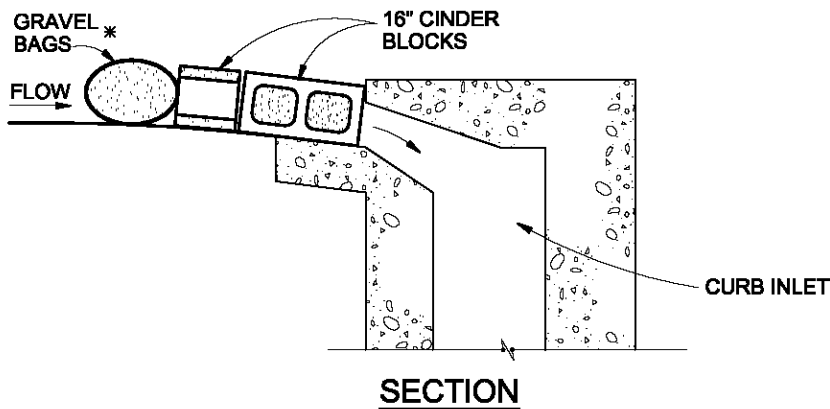
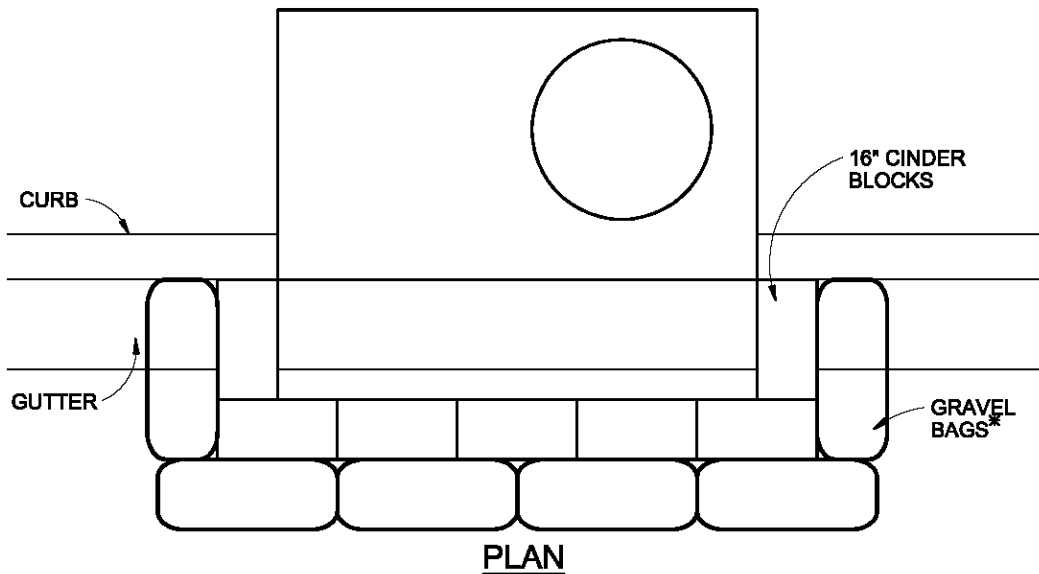
STRAW BALE INLET PROTECTION NOTES

INSTALLATION REQUIREMENTS

1. INLET PROTECTION SHALL BE INSTALLED IMMEDIATELY AFTER CONSTRUCTION OF INLET.
2. BALES ARE TO BE PLACED IN A SINGLE ROW AROUND THE INLET WITH THE END OF THE BALES TIGHTLY ABUTTING ONE ANOTHER.
3. SEE STRAW BALE BARRIER FIGURE SBB-2 FOR INSTALLATION REQUIREMENTS.

MAINTENANCE REQUIREMENTS

1. CONTRACTOR SHALL INSPECT STRAW BALE INLET PROTECTION IMMEDIATELY AFTER EACH RAINFALL, AT LEAST DAILY DURING PROLONGED RAINFALL, AND WEEKLY DURING PERIODS NO RAINFALL.
2. DAMAGED OR INEFFECTIVE INLET PROTECTION SHALL PROMPTLY BE REPAIRED, REPLACING BALES IF NECESSARY, AND UNENTRENCHED BALES NEED TO BE REPAIRED WITH COMPACTED BACKFILL MATERIAL.
3. SEDIMENT SHALL BE REMOVED FROM BEHIND STRAW BALES WHEN IT ACCUMULATES TO APPROXIMATELY 1/3 THE HEIGHT OF THE BARRIER.
4. INLET PROTECTION SHALL BE REMOVED WHEN ADEQUATE VEGETATIVE COVER IS ATTAINED WITHIN THE DRAINAGE AREA AS APPROVED BY THE CITY.



BLOCK AND GRAVEL BAG* CURB INLET PROTECTION

NTS

BLOCK AND GRAVEL BAG* CURB INLET PROTECTION NOTES

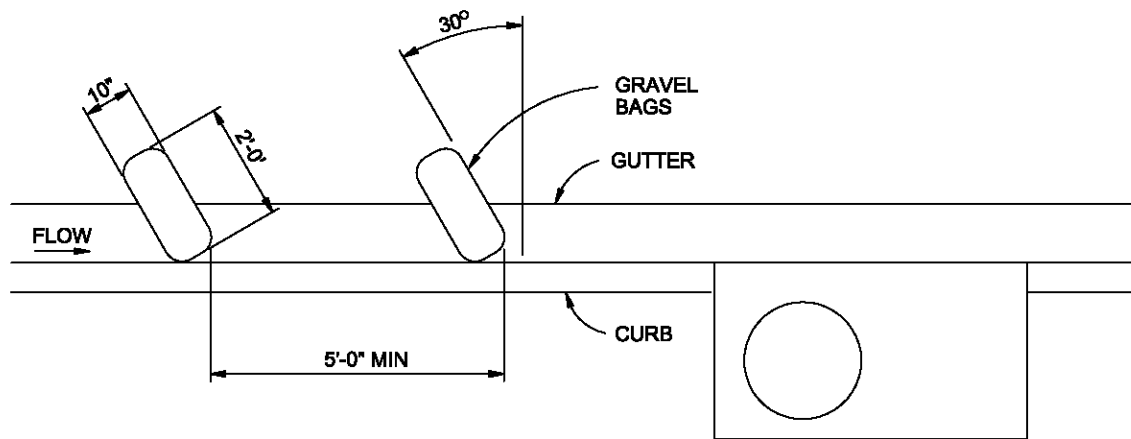
INSTALLATION REQUIREMENTS

1. INLET PROTECTION SHALL BE INSTALLED IMMEDIATELY AFTER CONSTRUCTION OF INLET.
2. CONCRETE BLOCKS ARE TO BE LAID AROUND THE INLET IN A SINGLE ROW ON THEIR SIDES, ABUTTING ONE ANOTHER WITH THE OPEN ENDS OF THE BLOCK FACING OUTWARD.
3. GRAVEL BAGS ARE TO BE PLACED AROUND THE CONCRETE BLOCKS CLOSELY ABUTTING ONE ANOTHER SO THERE ARE NO GAPS.
4. GRAVEL BAGS ARE TO CONTAIN WASHED SAND OR GRAVEL APPROXIMATELY 3/4 INCH IN DIAMETER.
5. BAGS ARE TO BE MADE OF 1/4" INCH WIRE MESH (USED WITH GRAVEL ONLY) OR GEOTEXTILE.

MAINTENANCE REQUIREMENTS

1. CONTRACTOR SHALL INSPECT INLET PROTECTION IMMEDIATELY AFTER EACH RAINFALL, AT LEAST DAILY DURING PROLONGED RAINFALL, AND WEEKLY DURING PERIODS NO RAINFALL.
2. DAMAGED OR INEFFECTIVE INLET PROTECTION SHALL PROMPTLY BE REPAIRED OR REPLACED.
3. SEDIMENT SHALL BE REMOVED WHEN SEDIMENT HAS ACCUMULATED TO APPROXIMATELY 1/2 THE DESIGN DEPTH OF THE TRAP.
4. INLET PROTECTION SHALL BE REMOVED WHEN ADEQUATE VEGETATIVE COVER IS ATTAINED WITHIN THE DRAINAGE AREA AS APPROVED BY THE CITY.

* AN ALTERNATE 3/4" TO 1" GRAVEL FILTER OVER A WIRE SCREEN MAY BE USED IN PLACE OF GRAVEL BAGS. THE WIRE MESH SHALL EXTEND ABOVE THE TOP OF THE CONCRETE BLOCKS AND THE GRAVEL PLACED OVER THE WIRE SCREEN TO THE TOP OF THE CONCRETE BLOCKS.



CURB SOCK INLET PROTECTION

NTS

CURB SOCK INLET PROTECTION NOTES

INSTALLATION REQUIREMENTS

1. INLET PROTECTION SHALL BE INSTALLED IMMEDIATELY AFTER CONSTRUCTION OF INLET.
2. SOCK IS TO BE MADE OF 1/4 INCH WIRE MESH (USED WITH GRAVEL ONLY) OR GEOTEXTILE.
3. WASHED SAND OR GRAVEL 3/4 INCH TO 4 INCHES IN DIAMETER IS PLACED INSIDE THE SOCK.
4. PLACEMENT OF THE SOCK IS TO BE 30 DEGREES FROM PERPENDICULAR IN THE OPPOSITE DIRECTION OF FLOW.
5. SOCKS ARE TO BE FLUSH WITH THE CURB AND SPACED AT A MINIMUM 5 FEET APART.
6. AT LEAST 2 CURB SOCKS IN SERIES IS REQUIRED.

MAINTENANCE REQUIREMENTS

1. CONTRACTOR SHALL INSPECT INLET PROTECTION IMMEDIATELY AFTER EACH RAINFALL, AT LEAST DAILY DURING PROLONGED RAINFALL AND WEEKLY DURING PERIODS NO RAINFALL.
2. DAMAGED OR INEFFECTIVE INLET PROTECTION SHALL PROMPTLY BE REPAIRED OR REPLACED.
3. SEDIMENT SHALL BE REMOVED FROM BEHIND THE SOCK WHEN GUTTER WIDTH IS FILLED.
4. INLET PROTECTION SHALL BE REMOVED WHEN ADEQUATE VEGETATIVE COVER IS ATTAINED WITHIN THE DRAINAGE AREA AS APPROVED BY THE CITY.

RECOMMENDED ANNUAL GRASSES

SPECIES (COMMON NAME)	GROWTH SEASON	SEEDING DATE	POUNDS OF PURE LIVE SEED (PLS) (PLS/ACRE)	PLANTING DEPTH (INCHES)
1. OATS	COOL	MARCH 16 - APRIL 30	35-50	1-2
2. SPRING WHEAT	COOL	MARCH 16 - APRIL 30	25-35	1-2
3. SPRING BARLEY	COOL	MARCH 16 - APRIL 30	25-35	1-2
4. ANNUAL RYEGRASS	COOL	MARCH 16 - JUNE 30	10-15	1/2
5. MILLET	WARM	MAY 16 - JULY 15	3-15	1/2-3/4
6. SUDANGRASS	WARM	MAY 16 - JULY 15	5-10	1/2-3/4
7. SORGHUM	WARM	MAY 16 - JULY 15	5-10	1/2-3/4
8. WINTER WHEAT	COOL	SEPTEMBER 1 - 30	20-35	1-2
9. WINTER BARLEY	COOL	SEPTEMBER 1 - 30	20-35	1-2
10. WINTER RYE	COOL	SEPTEMBER 1 - 30	20-35	1-2
11. TRITICALE	COOL	SEPTEMBER 1 - 30	25-40	1-2

THIS TABLE WAS TAKEN FROM UDFCD FOR RECOMMENDED ANNUAL GRASSES FOR THE DENVER METROPOLITAN AREA. THIS TABLE MAY BE USED UNLESS A SITE-SPECIFIC SEED MIX IS REQUESTED AND APPROVED.

TABLE TS-1

TEMPORARY SEEDING NOTES

INSTALLATION REQUIREMENTS

MAINTENANCE REQUIREMENTS

1. DISTURBED AREAS ARE TO BE SEEDED WITHIN 21 DAYS AFTER CONSTRUCTION ACTIVITY OR GRADING ENDS IF SEASON ALLOWS.
2. IF NECESSARY, SOIL IS TO BE CONDITIONED FOR PLANT GROWTH BY APPLYING TOPSOIL, FERTILIZER, OR LIME.
3. SOIL IS TO BE TILLED IMMEDIATELY PRIOR TO APPLYING SEEDS. COMPACT SOILS ESPECIALLY NEED TO BE LOOSENED.
4. SEEDBED DEPTH IS TO BE 4 INCHES FOR SLOPES FLATTER THAN 2:1, AND 1 INCH FOR SLOPES STEEPER THAN 2:1.
5. ANNUAL GRASSES LISTED IN TABLE TS-1 ARE TO BE USED FOR TEMPORARY SEEDING. SEED MIXES ARE NOT TO CONTAIN ANY NOXIOUS WEED SEEDS INCLUDING RUSSIAN OR CANADIAN THISTLE, KNAPWEED, PURPLE LOOSESTRIPE, EUROPEAN BINDWEED, JOHNSON GRASS, AND LEAFY SPURGE.
6. TABLE TS-1 ALSO PROVIDES REQUIREMENTS FOR SEEDING RATES, SEEDING DATES, AND PLANTING DEPTHS FOR THE APPROVED TYPES OF ANNUAL GRASSES.
7. SEEDING IS TO BE APPLIED USING MECHANICAL TYPE DRILLS EXCEPT WHERE SLOPES ARE STEEP OR ACCESS IS LIMITED THEN HYDRAULIC SEEDING MAY BE USED.
8. ALL SEEDED AREAS ARE TO BE MULCHED (SEE FACTSHEET ON MULCHING).
9. IF HYDRAULIC SEEDING IS USED THEN HYDRAULIC MULCHING SHALL BE DONE SEPARATELY TO AVOID SEEDS BECOMING ENCAPSULATED IN THE MULCH.

1. REGULAR INSPECTIONS ARE TO BE MADE OF ALL SEEDED AREAS TO ENSURE GROWTH.
2. AREAS WHERE GROWTH IS NOT OCCURRING QUICKLY OR THE MULCH HAS BEEN REMOVED SHALL BE RE-SEEDED AS SOON AS POSSIBLE AND RE-MULCHED IF NEEDED.
3. SEEDED AREAS ARE NOT TO BE DRIVEN OVER WITH CONSTRUCTION EQUIPMENT OR VEHICLES.

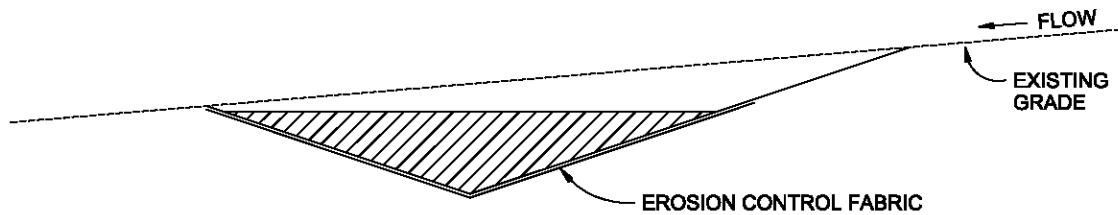
MULCHING NOTES

INSTALLATION REQUIREMENTS

1. ALL DISTURBED AREAS MUST BE MULCHED WITHIN 21 DAYS AFTER FINAL GRADE AND SEEDED AREAS ARE TO BE MULCHED WITHIN 24 HOURS AFTER SEEDING.
2. MATERIAL USED FOR MULCH CAN BE CERTIFIED CLEAN, WEED- AND SEED-FREE LONG STEMMED FIELD OR MARSH HAY, OR STRAW OF OATS, BARLEY, WHEAT, RYE, OR TRITICALE CERTIFIED BY THE COLORADO DEPARTMENT OF AGRICULTURE WEED FREE FORAGE CERTIFICATION PROGRAM.
3. HYDRAULIC MULCHING MATERIAL SHALL CONSIST OF VIRGIN WOOD FIBER MANUFACTURED FROM CLEAN WHOLE WOOD CHIPS. WOOD CHIPS CANNOT CONTAIN ANY GROWTH OR GERMINATION INHIBITORS OR BE PRODUCED FROM RECYCLED MATERIAL. GRAVEL CAN ALSO BE USED.
4. MULCH IS TO BE APPLIED EVENLY AT A RATE OF 2 TONS PER ACRE.
5. MULCH IS TO BE ANCHORED EITHER BY CRIMPING (TUCKING MULCH FIBERS 4 INCHES INTO THE SOIL), USING NETTING (USED ON SMALL AREAS WITH STEEP SLOPES), OR WITH A TACKIFIER.
6. HYDRAULIC MULCHING AND TACKIFIERS ARE NOT TO BE USED IN THE PRESENCE OF FREE SURFACE WATER.

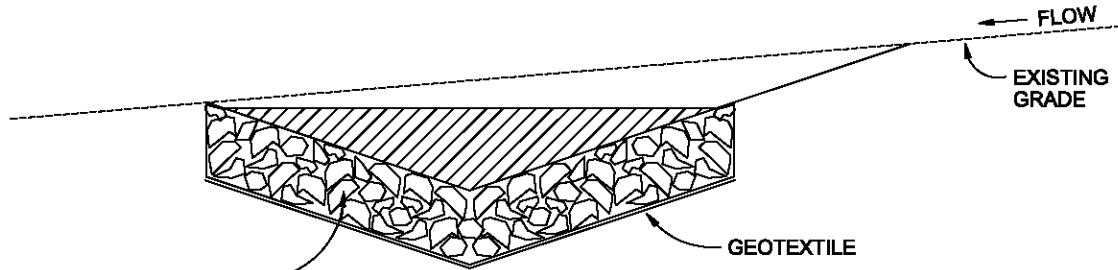
MAINTENANCE REQUIREMENTS

1. REGULAR INSPECTIONS ARE TO BE MADE OF ALL MULCHED AREAS.
2. MULCH IS TO BE REPLACED IMMEDIATELY IN THOSE AREAS IT HAS BEEN REMOVED, AND IF NECESSARY THE AREA SHOULD BE RESEDED.



A. EROSION CONTROL FABRIC

2% < SLOPE < 5% AND VELOCITY < 8 FPS



12" THICK RIPRAP TYPE "VL"

B. RIPRAP

SLOPE > 5% OR VELOCITY > 8 FPS

SWALE LINING

NTS

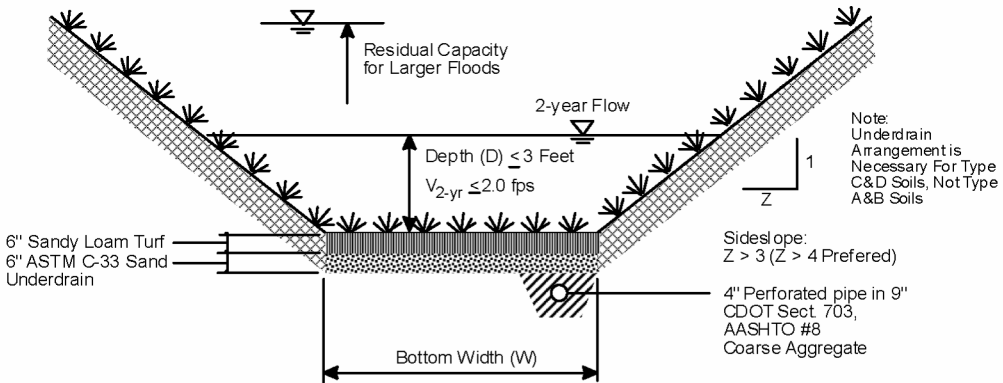
SWALE LINING NOTES

INSTALLATION REQUIREMENTS

1. REFER TO THE EROSION CONTROL BLANKETS FACTSHEET FOR PROPER INSTALLATION OF EROSION CONTROL FABRIC LINING.
2. SWALES WITH EASILY EROSIVE SOILS AND SLOPES LESS THAN 2%, SHALL BE LINED WITH EROSION CONTROL FABRIC.
3. VELOCITIES FOR EROSION CONTROL FABRICS SHALL NOT EXCEED 8 FPS. SWALES WITH VELOCITIES GREATER THAN 8 FPS SHALL BE LINED WITH RIP RAP.

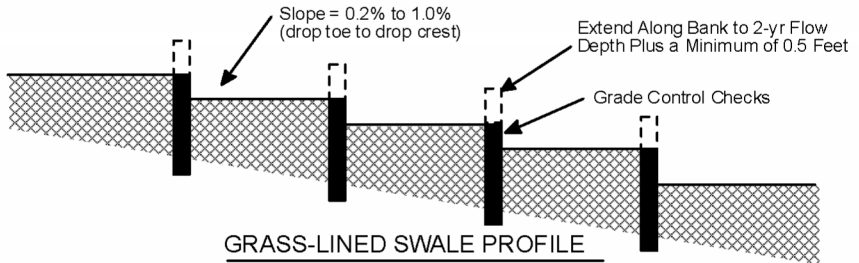
MAINTENANCE REQUIREMENTS

1. CONTRACTOR SHALL INSPECT SWALE LININGS AFTER EACH RAINFALL, AT LEAST DAILY DURING PROLONGED RAINFALL AND WEEKLY DURING PERIODS OF NO RAINFALL.
2. DAMAGED LININGS SHALL IMMEDIATELY BE REPAIRED.
3. REFER TO THE EROSION CONTROL BLANKETS FACTSHEET FOR PROPER MAINTENANCE.
4. DISPLACED RIPRAP OR COARSE AGGREGATE IS TO BE REPLACED AS SOON AS POSSIBLE.
5. SWALE LININGS ARE TO REMAIN IN PLACE AND BE PROPERLY MAINTAINED UNTIL THE TEMPORARY SWALE IS REMOVED.



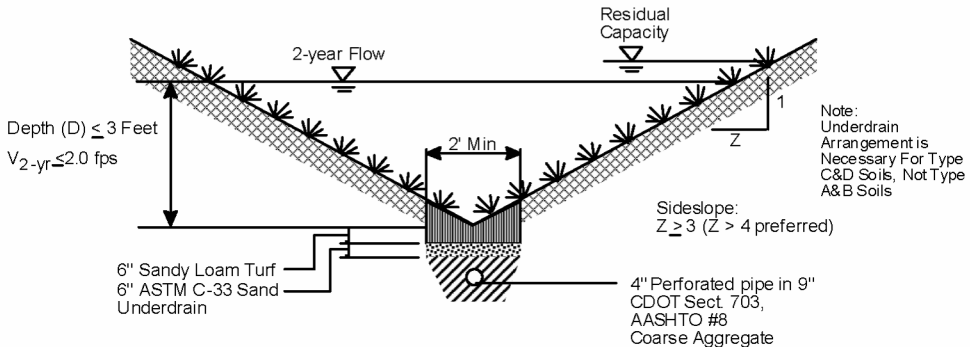
TRAPEZOIDAL GRASS-LINED SWALE SECTION

NOT TO SCALE



GRASS-LINED SWALE PROFILE

NOT TO SCALE



TRIANGULAR GRASS-LINED SWALE SECTION

NOT TO SCALE

APPENDIX 5: Erosion & Sediment Control Plan (ESC Plan) – Site Map

Insert GEC Plan once finalized.

ESC Plan includes, at a minimum, the following:

1. Construction site boundaries;
2. Flow arrows that depict stormwater flow directions on-site and runoff direction;
3. Areas of ground disturbance including areas of borrow and fill;
4. Areas used for storage of soil;
5. Locations of all waste accumulation areas, including areas for liquid, concrete, masonry, and asphalt;
6. Locations of dedicated asphalt, concrete batch plants and masonry mixing stations;
7. Locations of all structural control measures;
8. Locations of all non-structural control measures;
9. Locations of springs, streams, wetlands and other state waters, including areas that require pre-existing vegetation be maintained within 50 ft of a receiving water; and
10. Locations of all stream crossings located within the construction site boundary.

APPENDIX 6: Stormwater Inspection Form (Template)

Instructions:

This inspection report has been developed to complete the 7 day (or 14 day and storm event site inspections) and 30-day inspections at completed sites.

Contractor Construction Stormwater Site Inspection

General Information

Project Name: Project Name.	Project No.: Project No.	CDPS Cert. No.: COR-000000
Location: Location.	Date of Inspection: Date of Inspection.	Start and End Time: Start Time. / End Time.
Weather Conditions: <input type="checkbox"/> Clear <input type="checkbox"/> Cloudy <input type="checkbox"/> Rain <input type="checkbox"/> Sleet <input type="checkbox"/> Fog <input type="checkbox"/> Snow <input type="checkbox"/> High Winds <input type="checkbox"/> Other: Other.		Temperature: Temp.
Present Phase of Construction: Phase.	Estimated Area of Disturbance (ac): Est. Acentage.	

Inspection Information

Type of Inspection: Choose an item.	If Post-Storm Inspection, provide the storm information below:
Type: Choose an item. Date: Date. Time: Time. Duration (hrs): Duration.	Approximate Amount of Precipitation (in): Precipitation.
Has there been any deviations from the minimum inspection schedule? <input type="checkbox"/> Yes <input type="checkbox"/> No If “Yes, describe: Deviation.	
Inspector’s Name: Inspector’s Name.	Inspector’s Title: Inspector’s Title.
Is the above inspector a qualified stormwater manager? <input type="checkbox"/> Yes <input type="checkbox"/> No	
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? <input type="checkbox"/> Yes <input type="checkbox"/> No If “Yes” , select all that apply below:	
<input type="checkbox"/> Construction site perimeter; <input type="checkbox"/> All disturbed areas; <input type="checkbox"/> Designated haul routes; <input type="checkbox"/> Material and waste storage areas exposed to precipitation;	
<input type="checkbox"/> Locations where stormwater has the potential to discharge offsite; <input type="checkbox"/> Locations where vehicles exit the site; <input type="checkbox"/> Other: Other.	

Noncompliance Reporting to CDPHE

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.

- 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)
- 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? Yes No If **“Yes”** please document below

Date and Time of Incident	Location and Description of Noncompliance	Description of Corrective Action	Date and Time of 24 Hour Oral Notification	Date of 5 Day Written Notification ²
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² 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.

* If winter conditions exclusions is selected as type of inspection, please attach a copy of the required documentation from Part I.D.4.c of the Permit.

Date.	Time.	Noncompliance.	Noncompliance.	Date.	Time.	Date.
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Sediment Control Measures					
Type	Maintenance Needed?	Inadequate Control Measure?	Additional Control Measure Needed?	Location and description of Maintenance or Corrective Action.	Date Corrected
Choose an item.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Click or tap here to enter text.	Date.

Erosion Control Measures					
Type	Maintenance Needed?	Inadequate Control Measure?	Additional Control Measure Needed?	Location and description of Maintenance or Corrective Action.	Date Corrected
Choose an item.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Click or tap here to enter text.	Date.

Materials Management Control Measures					
Type	Maintenance Needed?	Inadequate Control Measure?	Additional Control Measure Needed?	Location and description of Maintenance or Corrective Action.	Date Corrected

Choose an item.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Click or tap here to enter text.	Date.
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Site Management Control Measures					
Type	Maintenance Needed?	Inadequate Control Measure?	Additional Control Measure Needed?	Location and description of Maintenance or Corrective Action.	Date Corrected
Choose an item.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Click or tap here to enter text.	Date.

Field Notes
Click or tap here to enter text.

Certification Statement	
<p>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:</p> <p>“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.”</p>	
<p>Name of Qualified Stormwater Manager.</p> <hr/> <p>Name of Qualified Stormwater Manager</p>	<p>Title of Qualified Stormwater Manager.</p> <hr/> <p>Title of Qualified Stormwater Manager</p>
<p>Signature of Qualified Stormwater Manager</p> <hr/>	<p>Date.</p> <hr/> <p>Date</p>

APPENDIX 7: Completed Stormwater Inspection Logs

(File completed inspection forms or reference electronic location of inspections here)