



CRESTONE PEAK
RESOURCES

STORMWATER MANAGEMENT PLAN
Submitted with Form 2A Application for:

**Alamosa 5-64 6-1 1BH, 2AH, 2BH, 3AH, 3BH, 4AH, 4BH 5-4-3 1AH, 1BH, 2AH,
2BH, 3AH, 3BH, 4AH**
Arapahoe County, Colorado

April 26, 2022

**Crestone Peak Resources' Stormwater Management Plan was developed with Substantially
Equivalent Information and in accordance with COGCC Rule 1002.f.**

PREPARED BY:
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Site Specific Stormwater Management Plan for Construction Activities

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1.0 INTRODUCTION

This facility is part of a comprehensive Field-Wide Stormwater Management Plan developed pursuant to the Colorado Department of Public Health and Environment (CDPHE) COR400000 Construction Stormwater Discharge Permit.

2.0 SITE DESCRIPTION

Operator / ID	Crestone Peak Resources Operating, LLC
Project / Site Name:	Alamosa 5-64 6-1 1BH, 2AH, 2BH, 3AH, 3BH, 4AH, 4BH 5-4-3 1AH, 1BH, 2AH, 2BH, 3AH, 3BH, 4AH
Location:	NE ¼, NE ¼ SEC. 5 & 6, T5S, R64W, Arapahoe County, Colorado
Total Project Disturbance:	Construction – 16.3 ac
Description of Existing Vegetation:	Non-Crop Land; This location occurs in a semi-arid shortgrass grassland and is usually composed of blue grama as the dominant or codominant species with associated grasses including purple three-awn, sideoats grama, hairy grama, buffalograss, needle-and-thread grass, needlegrass, western wheatgrass, Galleta grass, sand dropseed, and scattered shrubs, dwarf-shrubs and cacti. Vegetation composition is estimated 70-85% grasses and grass-like plants, 5-15% forbs, and 10-15% woody plants.
Known Weed Infestations:	Unknown
Soil Type(s):	Renohill-Little Thedalund complex, 9 to 30 percent slopes – 92.8% Fondis-Colby silt loams, 3 to 5 percent slopes – 4.8% Bresser-Stapleton sandy loams, 9 to 20 percent slopes – 2.4%
Primary Receiving Waters:	Box Elder Creek, 9,935' east of location Coal Creek, 11,705' west of location
Operator ID:	10633
CDPS Permit:	COR401102 (Appendix A)
Qualified Stormwater Manager:	Schuyler Hamilton – Environmental Specialist Crestone Peak Resources Mobile: 720.925.1820
SWMP Administrator:	David Cummings -Project Manager, P.E. Apex Companies, LLC Mobile: 402.707.9799
Site Contact:	Schuyler Hamilton – Environmental Specialist Crestone Peak Resources Mobile: 720.925.1820
Emergency Contact:	Schuyler Hamilton – Environmental Specialist Crestone Peak Resources Mobile: 720.925.1820

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3.0 TOPSOIL PROTECTION

Crestone operations personnel and construction contractors adhere to topsoil protection best practices, which include proper planning for both interim and final reclamation of the land during and following oil and gas activities. All topsoil management shall be in accordance with the Colorado Oil and Gas Conservation Commission (COGCC) Series 1000 Reclamation Rules 1001.a, 1002.b and 1002.c requirements.

3.1 Site Investigation

National Resources Conservation Service (NRCS) web soil survey data has been reviewed to determine sampling intervals and locations, to identify topsoil depths, texture, and fertility for development of grading plans, topsoil management, interim reclamation plans, and for final reclamation after decommissioning, well plugging and abandonment. Topsoil depth evaluations shall occur within the disturbance area, with the number of pits determined by topography, land use change, or distinct visual surface changes. When necessary, composite samples are gathered within each soil map unit at 0 to 6 inches in depth, using standard agronomic sampling procedures, for fertility and texture analysis.

3.2 Proposed Sequence of Major Activities

- A. Topsoil Removal: Depth of each soil horizon will vary with individual soil units, and determination of depth and proper removal will be monitored during construction by physical characteristics of color, density, and texture change of soil, and as determined during Site Investigation. Topsoil may not be removed during wet soil moisture conditions, as field determined considering soil texture.
- B. Subsoil Horizon Separation: Lower soil horizons will be stockpiled separately from topsoil where it can be used for contouring during reclamation and preserved in order of original state. Distinctly visible soil horizons or soil types shall be stockpiled separately (i.e. gravel or shale layers). Under no circumstances shall subsoil be mixed with topsoil, nor placed on top of the removed topsoil stockpile
- C. Topsoil Protection: If topsoil will be stockpiled for extended periods of time, it shall be protected from degradation due to erosion, compaction and contamination and to maintain soil microbial activity, using best management practices (BMPs) such as stabilizing with mulch, seeding, track walking, perimeter control or a combination of BMPs. Weeds on stockpiles shall be controlled as to prevent production of weed seed and/or enough biomass that would interfere with redistribution of soil or cause onsite debris. Signage shall be installed to identify topsoil stockpiles to facilitate subsequent reclamation and indicate to personnel that the area may not be disturbed during drilling and completion operations.
- D. Recontouring and Compaction Relief: The first material to backfill will be from excavated subsoil materials, and compacted to avoid subsidence, but not restrictive to root growth of plants. The stockpiled soil horizons will be replaced in order and graded with the adjacent undisturbed land. Ripping/subsoiling will be required prior to topsoil redistribution if soil is overly compacted from vehicle or equipment traffic.
- E. Topsoil Redistribution: The stockpiled topsoil will be redistributed uniformly and to minimize compaction of soil. Topsoil may not be redistributed during wet soil moisture conditions. Topsoil should be leveled with the adjacent undisturbed land, irrigable land being of importance for uniform coverage by flood irrigation water.

3.3 Topsoil Storage Requirements

- A. Calculations: Stored topsoil volumes necessary to facilitate subsequent or final reclamation shall be calculated based off areas remaining for production operations and integrated as

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part of the interim reclamation area per Rule 1003. Topsoil salvage quantities are included in the grading plans (Appendix C).

- B. Interim Reclamation: Placement and distribution will be determined by disturbance area boundaries, surface owner input, land use, and topography.
- C. Topsoil Protection: Stored topsoil shall be protected from erosion and to maintain soil microbial activity, using a combination of best management practices, such as proper design of stockpile depth and contour, stabilizing with mulch, seeding, track walking, perimeter control, establishment of vegetation and weed control.
- D. Signage and Identification: Stored topsoil locations will be documented per Rule 1002.b. Signage identifying topsoil shall be installed, where feasible, and based on land use.

4.0 STORMWATER MANAGEMENT PLAN

This site-specific Stormwater Management Plan (SWMP) for development in Arapahoe County, Colorado is intended to ensure construction activities adhere to good engineering, hydrologic, and pollution control practices, and to ensure erosion, sediment, and stormwater control measures are selected, installed, implemented, and maintained to protect state waters, and minimize site erosion or degradation.

4.1 Nature of Construction Activity

Construction activity will consist of major earthwork, grading and stripping for the purposes of pad construction. Once disturbance allowance is delineated, crews will begin access road construction and perimeter control installation prior to earthwork. Upon installation of perimeter controls, stripping, grading, and stockpiling shall occur. Following completion of earthwork, the disturbance shall be stabilized with structural and non-structural control measures.

All construction and development shall be in accordance with the Colorado Department of Public Health and Environment's CDPS General Permit for Stormwater Discharges Associated with Construction Activity, and the Colorado Oil and Gas Conservation Commission (COGCC) 304.c.15 and 1002.f rules and requirements.

4.2 Proposed Sequence of Major Activities

- A. Delineation of disturbance limits (staking)
- B. Access road construction
- C. Perimeter control installation
- D. Grading, stripping, excavation, and earthwork for pad construction
- E. Well drilling & completion(s)
- F. Facility construction
- G. Pipeline & flowline installation
- H. Disturbance reduction
- I. Interim & final reclamation

4.3 Potential Pollutant Sources

Potential pollution sources shall be placed within the project construction boundary, designated staging area(s), working surface, contained by general or sized secondary containment, and stormwater perimeter control measures. Anticipated pollution sources which will be managed by appropriate BMP fact sheets or operational best management standard operating procedures including, but are not limited to:

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- | | | |
|---|---|---|
| <input checked="" type="checkbox"/> Disturbed and stored soils | <input checked="" type="checkbox"/> Vehicle/equipment maintenance and fueling | <input checked="" type="checkbox"/> Non-industrial waste |
| <input checked="" type="checkbox"/> Vehicle tracking of sediments | <input checked="" type="checkbox"/> Dust generating processes | <input checked="" type="checkbox"/> Potential Spills |
| <input type="checkbox"/> Management of contaminated soils | <input checked="" type="checkbox"/> Routine maintenance activities | <input checked="" type="checkbox"/> Spill prevention and response |
| <input checked="" type="checkbox"/> Loading/unloading ops | <input checked="" type="checkbox"/> On-site waste management | |
| <input checked="" type="checkbox"/> Outdoor storage activities | <input type="checkbox"/> Concrete truck washing | |

No dedicated concrete or asphalt batch plants will be at the project location. Safety Data Sheets (SDS) for materials to be used are maintained by Crestone. Pollutants shall be managed in accordance with waste regulations administered by COGCC 900 series rules.

4.4 Erosion, Sediment and Stormwater Control Measures

Measures for stormwater, erosion, and sediment control will be accomplished through a combination of construction techniques, structural and non-structural controls, vegetation, and re-vegetation, administrative controls, and good housekeeping practices. Control measures will be implemented and adjusted with changing site conditions, as well as phases of construction. All control measures deployed throughout construction, shall be identified on site specific stormwater management plan as-built maps. Control measure installation and maintenance procedures will defer to Urban Drainage and Flood Control District specifications, or as identified in Section 6.0 and the grading plans (Appendix C).

4.5 Materials Handling and Spill Prevention

Discharges of hazardous substances or oil resulting from spills or construction operations are not authorized under the Construction General Permit or this plan. **In the event of a spill, the Stormwater Manager shall be notified immediately and/or after any emergency response procedures.** Depending on the nature of the spill and material(s) involved, the Colorado Department of Public Health and Environment 24-hour spill reporting line (877-518-5608), Colorado Oil and Gas Conservation Commission (COGCC), local authority (if applicable), and any affected downstream water users shall notified, as necessary. COGCC reporting shall adhere to 900 series rule requirements, and notification made for all spills of 1 bbl or more outside of secondary containment.

4.6 Non-Stormwater Discharges

Sources of non-stormwater discharges include emergency fire-fighting activities or a fire hydrant, and uncontaminated springs which do not originate from an area of land disturbance. In the event of construction dewatering, control measures shall be implemented and Low Risk Discharge Guidance for Uncontaminated Groundwater to Land (WQP27) shall be followed.

4.7 Final Stabilization

The Colorado Department of Health and Environment (CDPHE) defines final stabilization as, "finally stabilized means that all ground surface disturbing activities at the site have been completed, and all disturbed areas have been either built on, paved, or a uniform vegetative cover has been established with an individual plant density of at least 70 percent of pre-disturbance levels, and the vegetation cover is capable of providing erosion control equivalent to pre-existing conditions, or equivalent permanent, physical erosion reduction methods have been employed." Stabilized unpaved surfaces, such as gravel access roads or working surfaces, necessary for the operation of the facility or nearby facilities, also qualifies as "final stabilized".

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4.8 Post-Construction Stormwater

Following final stabilization, and pursuant of COGCC rule 1002.f and rule 1004, BMPs shall be maintained under Crestone's Post-Construction Stormwater Program, and evaluated for Tier 1 / Non-Tier 1 status, as applicable and per COGCC 100 series definitions, until the facility is abandoned, and final reclamation is achieved.

5.0 INTERIM RECLAMATION

Crestone will adhere to an interim reclamation plan as identified in the grading plans (Appendix C). This plan will establish proper planning and execution for reclamation in areas that are affected by oil and gas location construction and development, but no longer in use by production operations. When all wells on a location are completed and turned over to production, the drilling footprint will be reduced, and areas not needed for production will be restored and re-vegetated in accordance with Colorado Oil and Gas Conservation Commission (COGCC) 1000 Series Reclamation Regulations and consistent with the requirements of Rule 1003 Interim Reclamation. Reference shall also be made to Rules 304.c(14) Topsoil Protection Plan and 304.c(15) Stormwater Management Plan during this process.

Soil and aggregate mix used to build a compacted working surface will be removed in areas no longer needed for production. All segregated soil horizons removed from the disturbance area shall be replaced to their original relative positions and contour based on final land use and shall be tilled adequately to alleviate compaction and re-establish a proper seedbed. Final contour, irrigation, and landscape construction, including plantings and perennial seeding, will occur in the first favorable season. The area shall be treated as necessary to prevent invasion of undesirable species and noxious weeds as practicable. The site will be stabilized, inspected, and maintained to control erosion.

5.1 Proposed Sequence of Major Activities

- A. Surface Owner Consultation and Timing: Surface owner consultation shall be conducted to minimize disruption of agricultural operations and designate final land use. Interim reclamation shall occur no later than 6 months, after conclusion of subsequent operations. If soil conditions are not conducive due to weather conditions, a Sundry Notice Form 4 shall be submitted, and reclamation commenced as soon as conditions allow and as practicable.
- B. Recontouring, Compaction Relief and Topsoil Redistribution: Refer to the Topsoil Protection Plan to address site specific requirements.
- C. Soil Preparation: Equipment to be cleaned from soil or debris prior to mobilizing and commencing soil preparation operations between properties.
 - 1) Compaction Alleviation: After topsoil re-distribution, the area shall be cross ripped to a depth of eighteen inches with an agricultural ripper/subsoiler; however, this depth may be adjusted in rocky or shallow soils. Chiseling/ripping will be performed at the minimum depth of topsoil. Cultipacker or disking may be required to reduce soil clod size. Ripping with construction style shanks, for the purpose of surface ridge roughness as a stormwater control measure, is only allowed to a six-inch depth.
 - 2) Leveling: All areas will be leveled and graded to drain properly and blend to the adjacent undisturbed land.
 - 3) Soil Amendments: Necessary amendments will be determined by soil analysis completed during Topsoil Protection Plan Site Investigation, land use, site conditions at time of interim reclamation, and surface owner consultation.

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- 4) Seedbed Preparation: Incorporate soil amendments by disking, harrowing or cultipacking and to provide a seedbed that is firm and friable, and properly crimp straw mulch material.
 - 5) Surface Rock Removal: Surface rocks that interfere with agricultural operations, seeding equipment or future mowing operations will be removed.
- D. Seeding: Seed mix is considered based on consultations with NRCS, CPW, and surface owner; also, by soil type, land use, adjacent reference area vegetation and in accordance with Rule 1202.a.6. Seeding shall not occur in windy conditions or when the soil is frozen or wet. Equipment shall be cleaned from previous mixes, soil, or debris, prior to mobilizing and commencing seeding operations between properties to avoid cross-contamination. Seed shall be applied using appropriate equipment that can place the specified seed at the specified rate and depth.
- E. Mulching: Mulch to be applied within 48 hours after seeding on non-cropland. Mulch application in cropland shall be applied as requested by surface owner. If using straw or hay mulch, only mulch that has been certified as weed-free forage may be used. All mulch types must be anchored properly by methods such as crimping, disking and/or tackifier. Contractor may adjust the rate of mulch and type based on site location, soils, slopes, and time of year to maximize seeding and erosion control success.
- F. Implement Post-Construction Stormwater Control Measures: Additional erosion control measures and materials should include consideration of land use, surface owner grazing practices, and potential damage to materials. Refer to a site-specific stormwater management plan prior to implementation.
- G. Weed control: Weed control measures shall be conducted in compliance with the Colorado Noxious Weed Act, C.R.S. §35-5.5-115 and the current rules pertaining to the administration and enforcement of the Colorado Noxious Weed Act.
- 1) Weed control measures shall be conducted in consultation with the surface owner and County Weed Management Specialist(s) based on site specific conditions. Crestone will monitor and control noxious weeds until the reclamation threshold for release within reclaimed disturbance areas is achieved, including monitoring to measure success of treatments. Weed control measures employed may include mowing or removal and herbicide treatment during the appropriate growing season. During drilling, production, and reclamation operations, all disturbed areas shall be kept reasonably free of noxious weeds and undesirable species.

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6.0 SITE-SPECIFIC BMPs: EROSION & SEDIMENT STORMWATER CONTROL MEASURES, INSPECTION AND MAINTENANCE PROCEDURES

Site-specific control measures will be inspected on a routine basis by operations personnel, and as identified in Section 6.2 of this SWMP. If a control measure is found to be inadequate or non-functional, a corrective action will be issued by inspection personnel, and the control measure will be replaced, or a new control measure specified. A schedule for implementation of these corrective actions, including date issued and date completed, will be identified in site-specific maintenance logs. The anticipated stormwater control measures, required inspection scheduled, and maintenance processes are detailed below.

6.1 BMPs for Construction

The following control measures will be implemented during all phases of construction. Construction phases are identified in the grading plans (Appendix C). Timing of phases will be dependent on permit approvals and construction crew(s) scheduling.

BMP Type	Phase of Construction	Location of BMP	BMP Implementation
Reinforced Rock Berms (RRB And RRC)	Drilling / Completions (Active Construction) and Production (Interim Reclamation)	At culvert inlet / outlets, and within swales as check dam structures.	Reinforced rock for culverts (RRCs) shall be utilized upstream and downstream of the culverts. Reinforced rock berms (RRBs) will also be placed intermittently along the flowline of the roadside ditches. The RRBs will be placed in the interim reclamation phase, while the RRCs will be placed during active construction, and maintained throughout interim reclamation.
Stabilized Staging Area (SSA)	Drilling / Completions (Active Construction) and Production (Interim Reclamation)	Working surface of pad.	The stabilized staging area shall be used for equipment storage, parking, a loading/unloading zone, portable toilets, construction trailer, waste collection, and material stockpile and storage. The stabilized staging area will essentially be the perimeter of the working surface during construction.
Sediment Basin (SB)	Drilling / Completions (Active Construction) and Production (Interim Reclamation)	At low points / outfalls from the diversion ditch network.	Where the tributary disturbed area is greater than 1 acre, a sediment basin will be planned for the well site at the low point of the pad. It will be implemented at the downstream termination of the diversion ditches. The basin will contain silt from the upstream cut

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BMP Type	Phase of Construction	Location of BMP	BMP Implementation
			and fill slopes around the drill pad. Periodic maintenance of the pond may be necessary to remove accumulated silt and debris. Sediment basins shall be installed before the site grading begins.
Sediment Trap (ST)	Drilling / Completions (Active Construction) and Production (Interim Reclamation)	At low points / outfalls from the diversion ditch network.	Where the tributary disturbed area is less than 1 acre a sediment trap will be planned for the well site at the low point of the pad. It may be implemented at the downstream termination of the diversion ditches. The trap will contain silt from the upstream fill slopes around the pad. Periodic maintenance of traps may be necessary to remove accumulated silt and debris. Sediment traps shall be installed before site grading begins.
Diversion Ditches (DD)	Drilling / Completions (Active Construction) and Production (Interim Reclamation)	Surrounding the pad working surface.	Unlined diversion ditches will be constructed at the toe of the cut and fill slopes along the boundaries of the pad. These ditches will capture sediment laden runoff from the slopes and channel it into sediment basins and/or traps. In the fill slope application, the material excavated for the ditch shall be compacted and bermed on the downhill side for an additional layer of protection. Diversion ditches shall be installed before grading work begins on the fill slopes and as soon as the site grading is complete on the cut slopes.
Seeding And Mulching (SM)	Drilling / Completions (Active Construction) and Production (Interim Reclamation)	All areas where construction activity has ceased for 14 or more calendar days which have not been temporarily	Cut and fill slopes adjacent to the pad and access road swales shall be stabilized with SM. It shall be applied after grading is complete in the final phase. If the seeding and mulching application does not provide adequate stabilization for

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BMP Type	Phase of Construction	Location of BMP	BMP Implementation
		stabilized, and areas of final reclamation.	the area where slopes exceed 4:1, then more robust bmp's shall be utilized.
Sediment Control Log (SCL)	Drilling / Completions (Active Construction) and Production (Interim Reclamation)	Along the contour of cut and fill slopes and surrounding soil storage areas.	9" diameter sediment control logs shall be used on the downstream perimeter of the spoil and topsoil stockpiles per manufacturer specifications. Sediment control logs shall be installed in the interim phase once stockpiles have been created.
Vehicle Tracking Control (VTC)	Drilling / Completions (Active Construction) and Production (Interim Reclamation)	A temporary VTC may be used roadway access, prior to paving the asphalt apron.	In lieu of a VTC, the contractor shall install an asphalt apron where a proposed access road intersects a paved public roadway. If the public roadway is gravel, a VTC is not necessary. VTC or asphalt apron shall be installed in the initial phase before the site grading begins.
Riprap	Drilling / Completions (Active Construction) and Production (Interim Reclamation)	At sediment basin and culvert outfalls.	Type-m riprap shall be installed downstream of all culverts for a width of 4 times the culvert diameter and a length of 4 times the culvert diameter. Riprap shall be installed in the interim phase, following culvert or outfall installation.
Erosion Control Blanket (ECB)	Drilling / Completions (Active Construction) and Production (Interim Reclamation)	As necessary along eroded slopes.	Steep slopes shall be protected with straw coconut blankets where indicated on the SWMP plan or where seeding and mulching application is not effective. Blanket shall be installed with seeding during the final phase.

6.2 BMPs for Inspections

Inspections will be conducted to document the status of construction activities, stormwater control measure placement, maintenance needs, and effectiveness, to evaluate pollution sources, and to document reclamation / final stabilization progress. Inspections will be managed by the Stormwater Manager and SWMP Administrator and conducted by their designated representative(s). Inspection forms will document current conditions, non-compliance conditions including any release of sediment or other contaminants, additional control measures that are needed, or repair and maintenance work orders.

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- During construction, inspections shall be conducted every 14 days, and after a major precipitation or melt event, which has the potential to cause surface runoff.
- For sites earthwork and construction is completed, but final stabilization is not achieved due to vegetative cover, inspections shall be conducted every 30 days and exclude precipitation or melt event response. Inspections will continue until all reclaimed areas have achieved a cover of 70% the pre-construction reference vegetation (i.e. final stabilization).
- Post-construction stormwater inspections will be conducted in accordance with COGCC Rules 1002.f and 1003.e, to document the status of the location, maintenance needs, effectiveness of stormwater control measures, to evaluate pollution sources, and to document reclamation / final stabilization progress. Inspections will be managed by the Stormwater Manager and conducted by their designated representative(s).
- Findings, inspection records and site maps are documented electronically and available within 24 hours of any inspection. All inspection records are stored for a minimum of three years after the location has achieved final stabilization.

6.3 BMPs for Maintenance

For maintenance items discovered at active construction locations:

- Action and documentation towards completing repairs identified at the time of inspection shall be made within 24 hours of discovery.
- For maintenance items during post-construction, items will be documented and coordinated with production crews.
- Timeline for completion of maintenance items are a priority and will depend on scope; but in all cases, shall not be completed until field conditions allow for safe access, and utility clearance has been confirmed for actions requiring ground disturbance / earthwork.

Construction BMPs

- **Reinforced Rock Berms (RRB And RRC)** will be implemented during Drilling / Completions (Active Construction) and Production (Interim Reclamation). They will be placed at the culvert inlet/outlets, and with swales as check dam structures. Reinforced rock for culverts (RRCs) shall be utilized upstream and downstream of the culverts. Reinforced rock berms (RRBs) will also be placed intermittently along the flowline of the roadside ditches. The RRBs will be placed in the interim reclamation phase, while the RRCs will be placed during active construction, and maintained throughout interim reclamation.
- **Stabilized Staging Area (SSA)** will be implemented during Drilling / Completions (Active Construction) and Production (Interim Reclamation). It will be on the working pad surface. The stabilized staging area shall be used for equipment storage, parking, a loading/unloading zone, portable toilets, construction trailer, waste collection, and material stockpile and storage. The stabilized staging area will essentially be the perimeter of the working surface during construction.
- **Sediment Basin (SB)** will be implemented during Drilling / Completions (Active Construction) and Production (Interim Reclamation). It will be constructed at low points/ outfalls from the diversion ditch network. Where the tributary disturbed area is greater than 1 acre, a sediment basin will be planned for the well site at the low point of the pad. It will be implemented at the downstream termination of the diversion ditches. The basin will contain silt from the upstream cut and fill slopes around the drill pad. Periodic maintenance of the pond may be necessary to remove accumulated silt and debris. Sediment basins shall be installed before the site grading begins.
- **Sediment Trap (ST)** will be implemented during Drilling / Completions (Active Construction) and Production (Interim Reclamation). It will be constructed at low points/ outfalls from the diversion ditch network. Where the tributary disturbed area is less than 1 acre a sediment trap will be planned for the well site at the low point of the pad. It may be implemented at the downstream termination of the diversion ditches. The trap will contain silt from the upstream fill slopes around the pad. Periodic maintenance of traps may be necessary to remove accumulated silt and debris. Sediment traps shall be installed before site grading begins.
- **Diversion Ditches (DD)** will be implemented during Drilling / Completions (Active Construction) and Production (Interim Reclamation). It will be constructed surrounding the working pad surface. Unlined diversion ditches will be constructed at the toe of the cut and fill slopes along the boundaries of the pad. These ditches will capture sediment laden runoff from the slopes and channel it into sediment basins and/or traps. In the fill slope application, the material excavated for the ditch shall be compacted and bermed on the downhill side for an additional layer of protection. Diversion ditches shall be installed before grading work begins on the fill slopes and as soon as the site grading is complete on the cut slopes.
- **Seeding And Mulching (SM)** will be implemented during Drilling / Completions (Active Construction) and Production (Interim Reclamation). It will be implemented in all areas where construction activity has ceased for 14 or more calendar days which have not been temporarily stabilized, and areas of final reclamation. Cut and fill slopes adjacent to the pad and access road swales shall be stabilized with SM. It shall be applied after grading is complete in the final phase.

If the seeding and mulching application does not provide adequate stabilization for the area where slopes exceed 4:1, then more robust bmp's shall be utilized.

- **Sediment Control Log (SCL)** will be implemented during Drilling / Completions (Active Construction) and Production (Interim Reclamation) along the contour of cut and fill slopes and surrounding soil storage areas. 9" diameter sediment control logs shall be used on the downstream perimeter of the spoil and topsoil stockpiles per manufacturer specifications. Sediment control logs shall be installed in the interim phase once stockpiles have been created.
- **Vehicle Tracking Control (VTC)** will be implemented during Drilling / Completions (Active Construction) and Production (Interim Reclamation). A temporary VTC may be used roadway access, prior to paving the asphalt apron. In lieu of a VTC, the contractor shall install an asphalt apron where a proposed access road intersects a paved public roadway. If the public roadway is gravel, a VTC is not necessary. VTC or asphalt apron shall be installed in the initial phase before the site grading begins.
- **Riprap** will be implemented during Drilling / Completions (Active Construction) and Production (Interim Reclamation) at the sediment basin and culvert outfalls. Type-m riprap shall be installed downstream of all culverts for a width of 4 times the culvert diameter and a length of 4 times the culvert diameter. Riprap shall be installed in the interim phase, following culvert or outfall installation.
- **Erosion Control Blanket (ECB)** will be implemented during Drilling / Completions (Active Construction) and Production (Interim Reclamation) as necessary along eroded slopes. Steep slopes shall be protected with straw coconut blankets where indicated on the SWMP plan or where seeding and mulching application is not effective. Blanket shall be installed with seeding during the final phase.

Inspection BMPs:

- During construction, inspections shall be conducted every 14 days, and after a major precipitation or melt event, which has the potential to cause surface runoff.
- For sites earthwork and construction is completed, but final stabilization is not achieved due to vegetative cover, inspections shall be conducted every 30 days and exclude precipitation or melt event response. Inspections will continue until all reclaimed areas have achieved a cover of 70% the pre-construction reference vegetation (i.e. final stabilization).
- Post-construction stormwater inspections will be conducted in accordance with COGCC Rules 1002.f and 1003.e, to document the status of the location, maintenance needs, effectiveness of stormwater control measures, to evaluate pollution sources, and to document reclamation / final stabilization progress. Inspections will be managed by the Stormwater Manager and conducted by their designated representative(s).
- Findings, inspection records and site maps are documented electronically and available within 24 hours of any inspection. All inspection records are stored for a minimum of three years after the location has achieved final stabilization.

Maintenance BMPs:

- Action and documentation towards completing repairs identified at the time of inspection shall be made within 24 hours of discovery.

- For maintenance items during post-construction, items will be documented and coordinated with production crews.
- Timeline for completion of maintenance items are a priority and will depend on scope; but in all cases, shall not be completed until field conditions allow for safe access, and utility clearance has been confirmed for actions requiring ground disturbance / earthwork.

APPENDIX A

CDPS STORMWATER GENERAL PERMIT CERTIFICATION



COLORADO

Department of Public
Health & Environment

**CERTIFICATION TO DISCHARGE
UNDER
CDPS GENERAL PERMIT COR400000
STORMWATER ASSOCIATED WITH CONSTRUCTION ACTIVITIES**

Certification Number: **COR401102**

This Certification to Discharge specifically authorizes:

**Owner Crestone Peak Resources
Operator Crestone Peak Resources**
to discharge stormwater from the facility identified as

COP Field Permit Arapahoe County East of Watkins

To the waters of the State of Colorado, including, but not limited to:

Box Elder Creek, Kiowa Creek, South Platte River

Facility Activity : Oil and Gas Exploration and Well Pad Development

Disturbed Acres: 281.1 acres

Facility Located at: County Line Rd and Watkins Rd Watkins CO 80137
Arapahoe County
Latitude 39.6714 Longitude -104.499444

**Specific Information
(if applicable):**

Certification is issued and effective: 1/29/2021
Expiration date of general permit: 3/31/2024

This certification under the permit requires that specific actions be performed at designated times. The certification holder is legally obligated to comply with all terms and conditions of the permit.

This certification was approved by:
Meg Parish, Section Manager
Permits Section
Water Quality Control Division



APPENDIX B

CDPHE ENVIRONMENTAL SPILL REPORTING FACT SHEET



Environmental Spill Reporting

*24–Hour Emergency and Incident Reporting Line
Office of Emergency Preparedness & Response*

1-877-518-5608

Updated: June, 2018

Reporting chemical spills and releases in Colorado

General

For all hazardous substance incidents, local emergency response agencies must be notified.

Releases from fixed facilities

The Superfund Amendments and Reauthorization Act (SARA) Title III, requires reporting releases from fixed facilities

Refer to the SARA Title III List of Lists, available from the Environmental Protection Agency (EPA), for the reportable quantity.

The party that owns the spilled material must immediately notify the following agencies or organizations:

- National Response Center (NRC) 1-800-424-8802;
- Colorado Emergency Planning Committee (CEPC), represented by the Colorado Department of Public Health and Environment (CDPHE) 1-877-518-5608; and
- Local Emergency Planning Committee (LEPC) 1-720-852-6600.

In addition to telephone notification, the responsible party must also send written notification describing the release and associated emergency response to both the CEPC (in this case, CDPHE) and the LEPC.

Releases from RCRA facilities

Emergency releases from facilities permitted under the Resource Conservation and Recovery Act (RCRA) are reportable according to the permit requirements.

The permit often requires reporting to CDPHE, even if the amount of the release is less than a reportable quantity under SARA Title III (6 CCR 1007-3 Part 264).

Permitted facilities and generators and transporters of hazardous waste are required to have and implement a contingency plan that describes the actions facility personnel must take in response to fires, explosions or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, surface or ground water at the facility (6 CCR 1007-3 Sections 261, 262, 263, 264 and 265).

Whenever there is an imminent or actual emergency situation, appropriate state or local agencies, with designated response roles as described in the contingency plan, must be notified immediately.

The National Response Center or government official designated as the regional on-scene coordinator must be notified immediately if it is determined that the facility has had a release, fire or explosion that could threaten human health or the environment outside the facility.

CDPHE and local authorities must be notified when the facility is back in compliance and ready to resume operations. In addition, the facility must send a written report to CDPHE within 15 days of any incident that requires implementation of the contingency plan. The contingency plan should include current contact information for notification and submittal of written reports.

Permitted facilities, generators and transporters that store hazardous waste must notify CDPHE within 24 hours of any release to the environment that is greater than one (1) pound and must submit a written report to CDPHE within 30 days of the release (6 CCR 1007-3).

Transportation accidents

Transportation accidents that require reporting:

- Result in a spill or release of a hazardous substance in excess of the reportable quantity (40 CFR Part 302.6)
- Cause injury or death or cause estimated property damage exceeding \$50,000.
- Cause an evacuation of the general public lasting one or more hours.

Those that close or shut down one or more major transportation arteries or facilities or result in fire, breakage, spillage, or suspected contamination from radioactive or infectious substances must immediately be reported to the National Response Center.

Refer to the EPA SARA Title III List of Lists for those substances that have reportable quantities.

In addition to the NRC being notified, the local emergency number (9-1-1) must be called and CDPHE should be notified.

Written notification of any transportation accident involving a release of hazardous materials must be provided to the U.S. Department of Transportation within 30 days (49 CFR Part 171.16)

Since hazardous waste is a subset of hazardous materials, transporters who have discharged hazardous waste must notify the NRC and provide a written report to the US Department of Transportation as noted in the above reporting requirements.

The transporter must give immediate notice to the nearest Colorado State Patrol office (8 CCR 1507-8 HMP 5) and the nearest law enforcement agency if the accident or spill involved a vehicle (42-20-113(3) CRS).

Notification and a written report detailing the ultimate disposition of the discharge of hazardous waste must also be provided to CDPHE (6 CCR 1007-2 Section 263.30). This may be a duplicate copy of the US Department of Transportation report

In the event of a spill or discharge of hazardous waste at a transfer facility, the transporter must notify CDPHE within 24 hours if the spill exceeds 55 gallons or if there is a fire or explosion.

Within 15 days of a reportable incident, the transporter must submit a written report of the incident to CDPHE, including the final disposition of the material (6 CCR 1007-2 Section 263.40).

Releases of hazardous waste at a transfer facility may also require notification to the National Response Center and a written report to the U.S. Department of Transportation.

Releases to water

A release of any chemical, oil, petroleum product, sewage, etc., which may enter waters of the State of Colorado (which include surface water, ground water and dry gullies or storm sewers leading to surface water) must be reported to CDPHE immediately (25-8-601 CRS).

Written notification to CDPHE must follow within five (5) days (5 CCR 1002-61, Section 61.8(5)(d)).

Any accidental discharge to the sanitary sewer system must be reported immediately to the local sewer authority and the affected wastewater treatment plant.

Releases of petroleum products and certain hazardous substances listed under the Federal Clean Water Act (40 CFR Part 116) must be reported to the National Response Center as well as to CDPHE (1-877-518-5608) as required under the Clean Water Act and the Oil Pollution Act.

Releases to air

Any unpredictable failure of air pollution control or process equipment that results in the violation of emission

control regulations should be reported CDPHE by 10 a.m. of the following working day, followed by a written notice explaining the cause of the occurrence and describing action that has been or is being taken to correct the condition causing the violation and to prevent such excess emissions in the future (5 CCR 1001-2 Common Provisions Regulations Section II.E).

If emergency conditions cause excess emissions at a permitted facility, the owner/operator must provide notice to CDPHE no later than noon of the next working day following the emergency, and follow by written notice within one month of the time when emission limitations were exceeded due to the emergency (5 CCR 1001-5, Regulation 3 Part C, Section VII.C.4).

Releases from oil and gas wells

All spills or releases of exploration and production wastes or produced fluids which meet the reporting thresholds of the Colorado Oil and Gas Conservation Commission (COGCC) Rule 906 shall be reported verbally to the COGCC within 24 hours of discovery and on the COGCC Spill/Release Report Form 19 within 72 hours of discovery.

Spills or releases are reportable to the COGCC in the following circumstances:

- 1) the spill or release impacts or threatens to impact any waters of the state, (which include surface water, ground water and dry gullies or storm sewers leading to surface water), a residence or occupied structure, livestock or a public byway;
- 2) a spill or release in which 1 barrel or more is released outside of berms or other secondary containment; or
- 3) any spill or release of 5 barrels or more.

COGCC also requires reportable spills or releases be reported to the surface owner and local government. Whether or not they are reportable, spills or releases of any size must be stopped, cleaned up, and investigated as soon as practicable.

If the spill or release impacts or threatens to impact waters of the state, it must also be reported immediately to CDPHE (25-8-601 CRS).

Releases from storage tanks

Petroleum releases of 25 gallons or more (or any size that causes a sheen on nearby surface waters) from regulated aboveground and underground fuel storage tanks must be reported to the Division of Oil and Public Safety (303-318-8547) within 24 hours. If the report is made after business hours, please leave a message on the technical assistance line for the Division of Oil and Public Safety, and contact the 24 hour CDPHE Emergency and Incident Reporting Line. This includes spills from fuel dispensers.

Spills or releases of hazardous substances from regulated storage tanks in excess of the reportable quantity (40 CFR Part 302.6) must be reported to the National Response Center and the local fire authority immediately, and to the Division of Oil and Public Safety within 24 hours. (8-20.5-208 CRS and 7 CCR 1101-14 Article 4).

Owners/operators of regulated storage tanks must contain and immediately clean up a spill or overfill of less than 25 gallons of petroleum and a spill or overfill of a hazardous substance that is less than the reportable quantity.

If cleanup cannot be accomplished within 24 hours, the Division of Oil and Public Safety must be notified immediately (7 CCR 1101-14 Article 4-4).

CDPHE should also be notified in the case of hazardous substance releases as cleanup activities may be covered by state solid or hazardous waste requirements (6 CCR 1007-2, 6 CCR 1007-3).

Any release that has or may impact waters of the state (which include surface water, ground water and dry

gullies or storm sewers leading to surface water), no matter how small, must be reported immediately to CDPHE (25-8-601 CRS).

Releases from pipelines

Releases of five or more gallons of hazardous liquids or carbon dioxide from a pipeline that result in explosion or fire, cause injury or death or cause estimated property damage (including cost of clean-up and recovery, value of lost product and property damage) exceeding \$50,000 must be reported immediately to the US Department of Transportation Office of Pipeline Safety (49 CFR Part 195 Subpart B) and the National Response Center.

Releases of five or more gallons of hazardous liquids or carbon dioxide from interstate pipelines that do not involve explosion or fire, injury or death or property damage exceeding \$50,000 should be reported to the US Department of Transportation Office of Pipeline Safety within 30 days after the incident.

Releases of natural gas from intrastate pipelines that cause injury or death, property damage in excess of \$50,000 (including the cost of lost product), closure of a public road, or evacuation of 50 or more people must be reported immediately to the Colorado Public Utilities Commission, Pipeline Safety Group (4 CCR 723-11-2).

Releases of natural gas or liquefied natural gas (LNG) from interstate pipelines that cause injury or death, property damage in excess of \$50,000 (including the cost of lost product), or results in an emergency shutdown of the facility must be reported immediately to the National Response Center and the US Dept of Transportation Office of Pipeline Safety.

Releases of oil, petroleum products or other hazardous liquids from interstate and intrastate pipelines that have or may enter waters of the State of Colorado (which include surface water, ground water and dry gullies or storm sewers leading to surface water) must be reported to CDPHE immediately (25-8-601 CRS). CDPHE should also be notified of releases to soil, as cleanup activities may be covered by state solid or hazardous waste requirements (6 CCR 1007-2, 6 CCR 1007-3).

Radiological accidents, incidents, and events

CDPHE must be notified of any condition that has caused or threatens to cause an event, which meets or exceeds the criteria specified in (6 CCR 1007-1) RH 4.51 and RH 4.52 of the State of Colorado *Rules and Regulations Pertaining to Radiation Control*. Reportable events include lost radioactive materials, lost radiation producing machines, over-exposures to persons, contamination events and fires or explosions involving radioactive materials.

Depending upon the severity of the event, notification may be required immediately, within 24 hours, or within 30 days. In most cases, a written follow-up report is also required.

If you are unsure of the proper notification requirement, please contact CDPHE immediately. Telephone event notifications can be made to the CDPHE Radiation Program at any time by calling 1-303-877-9757.

Notification Numbers

Colorado Department of Public Health and Environment toll-free 24-hour environmental emergency and incident reporting line: (877) 518-5608 (24-hour)

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

State Oil Inspector (Colorado Division of Oil & Public Safety-Above & Underground Storage Tank Regulators)
(303) 318-8547

APPENDIX C

GRADING, EROSION, AND SEDIMENT CONTROL PLAN(S)

GRADING, EROSION AND SEDIMENT CONTROL PLANS

ALAMOSA 5-64 6-1 1BH, 2AH, 2BH, 3AH, 3BH, 4AH, 4BH 5-4-3 1AH, 1BH, 2AH, 2BH, 3AH, 3BH, 4AH OIL & GAS WELL

SECTION 6 AND 5, TOWNSHIP 5 SOUTH, RANGE 64 WEST OF THE SIXTH PRINCIPAL MERIDIAN
COUNTY OF ARAPAHOE, STATE OF COLORADO
LATITUDE = 39°39'01.58"N, LONGITUDE = 104°35'08.66"W

THIS GRADING, EROSION AND SEDIMENT CONTROL (GESC) DOCUMENT HAS BEEN PLACED IN THE ARAPAHOE COUNTY FILE FOR THIS PROJECT AND APPEARS TO FULFILL THE LATEST VERSION OF THE ARAPAHOE COUNTY GRADING, EROSION AND SEDIMENT CONTROL MANUAL. ADDITIONAL GRADING, EROSION AND SEDIMENT CONTROL MEASURES MAY BE REQUIRED OF THE OWNER OR HIS/HER AGENTS. DUE TO UNFORESEEN EROSION CONTROL PROBLEMS OR IF THE SUBMITTED PLAN DOES NOT FUNCTION AS INTENDED, THE REQUIREMENTS OF THIS GESC DOCUMENT SHALL RUN WITH THE LAND AND BE THE OBLIGATION OF THE LAND OWNER, OR HIS/HER DESIGNATED REPRESENTATIVE(S) UNTIL SUCH TIME AS THE PLAN IS PROPERLY COMPLETED, MODIFIED OR VOIDED.

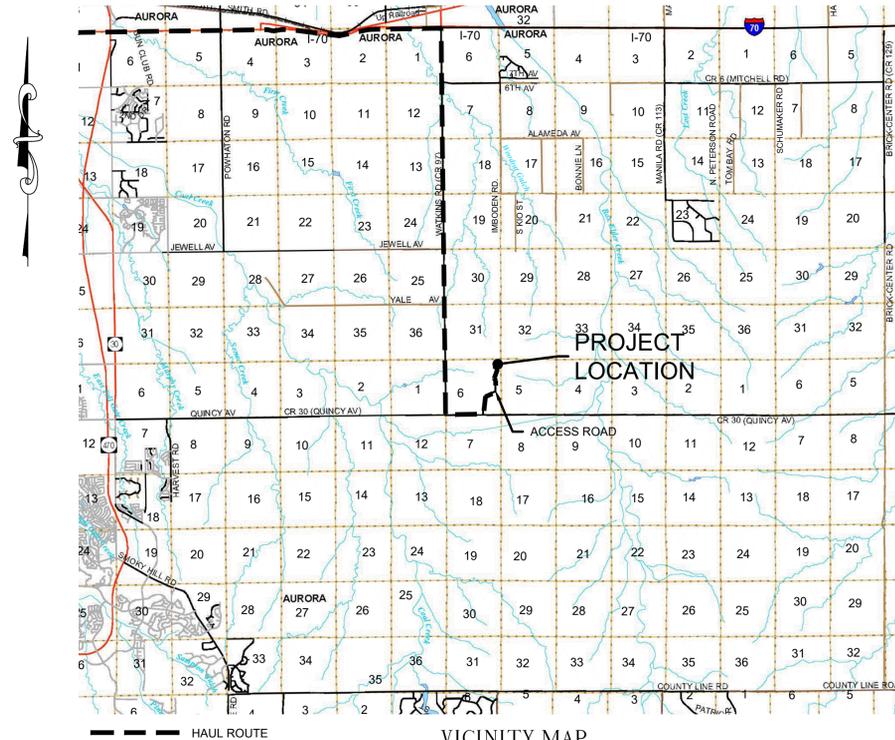
PROJECT SCOPE:

1. IN ADDITION TO INDICATING BMPs, THIS GESC PLAN SERVES AS A GUIDE TO CONSTRUCTING THE ACCESS ROAD, THE CULVERTS AND THE PAD SITE.
2. THERE IS ANTICIPATED EXCESS EARTHWORK MATERIAL. TOPSOIL AND SPOILS WILL BE TEMPORARILY STOCKPILED ADJACENT TO THE PAD SITE UNTIL THE PAD IS REHABILITATED.
3. THE PAD SITE IS PROPOSED TO BE FLAT (0% GRADE) SO THAT POTENTIAL RUNOFF FROM THE PAD IS ELIMINATED. AT THE BASE OF THE UPSTREAM CUT SLOPE, DIVERSION DITCHES ARE PROPOSED TO CAPTURE ONSITE TRIBUTARY FLOW, ELIMINATING RUNON.

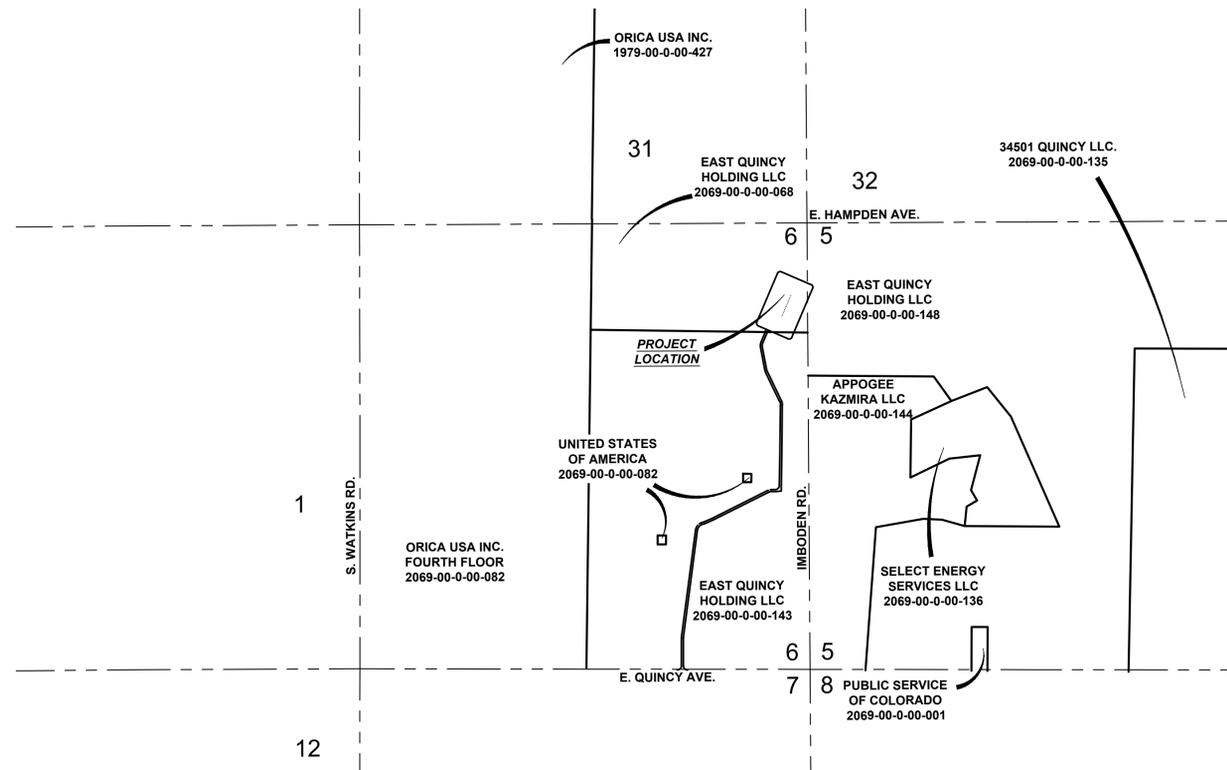
GENERAL NOTES:

1. APPROPRIATE CONTROL MEASURES MUST BE IMPLEMENTED PRIOR TO THE START OF LAND DISTURBANCE ACTIVITY. MUST CONTROL POTENTIAL POLLUTANTS DURING EACH PHASE OF CONSTRUCTION, AND MUST BE CONTINUED THROUGH FINAL STABILIZATION. APPROPRIATE STRUCTURAL AND NON-STRUCTURAL CONTROL MEASURES MUST BE MAINTAINED IN OPERATIONAL CONDITION.
2. SEE COVER SHEET OF ARAPAHOE COUNTY STANDARD NOTES AND DETAILS (SHEET 1 OF 4) FOR LEGEND OF BMP NAMES AND SYMBOLS IN FIELD WIDE REPORT. A COPY OF THE FIELD WIDE REPORT WILL BE ON SITE AT ALL TIMES AND CONTRACTOR WILL HAVE A COPY OF REPORT.
3. ANY BMPs SHOWN THAT REQUIRE GRADING, E.G. SEDIMENT BASINS, SEDIMENT TRAPS, ETC., SHALL NOT BE PLACED UNTIL AFTER THE PRE-CONSTRUCTION MEETING. IN ADDITION, THE SEDIMENT TRAPS (OR OTHER BMP) SHALL NOT BE INSTALLED UNTIL AFTER THE GESC PRE-CONSTRUCTION MEETING AND ISSUANCE OF THE GESC PERMIT BUT MUST BE FULLY FUNCTIONAL PRIOR TO ANY LARGE SCALE GRADING.
4. DASHED BMPs WERE INSTALLED IN INITIAL/INTERIM GESC PLAN AND, UNLESS OTHERWISE INDICATED, SHALL BE LEFT IN PLACE UNTIL REVEGETATION ESTABLISHMENT IS APPROVED BY THE COUNTY.
5. SEEDING AND MULCHING OF DISTURBED AREAS MUST BE COMPLETED WITHIN 14 DAYS IF THE AREAS WILL REMAIN UNDISTURBED FOR A PERIOD GREATER THAN 30 DAYS.
6. REMOVAL OF SEDIMENT TRAPS ON SITE SHALL ONLY OCCUR AFTER ALL AREAS TRIBUTARY TO THE SEDIMENT TRAPS HAVE BEEN FINAL LANDSCAPED AND ALL VEGETATION AS BEEN ESTABLISHED IN THE OPINION OF THE COUNTY.
7. VEHICLE AND EQUIPMENT MAINTENANCE AND FUELING WILL OCCUR IN THE STAGING/STORAGE AREA. THE GESC MANAGER SHALL DESIGNATE A SPECIFIC AREA WITHIN THE STAGING/STORAGE AREA FOR THIS ACTIVITY. THIS AREA SHALL BE PROTECTED WITH A ONE-FOOT (1') HIGH BERM TO FURTHER PROTECT THE SURROUNDING AREA FROM MIGRATION OF SPILLS, DRIPS, LEAKS, ETC. THAT OCCUR DURING ROUTINE OPERATIONS. IN THE EVENT IT IS NOT FEASIBLE OR PRACTICAL TO CONDUCT FUELING OR MAINTENANCE WITHIN THE CONFINES OF THIS DESIGNATED AREA, DRIP PANS SHALL BE USED TO CAPTURE VEHICLE/EQUIPMENT LIQUIDS. POLLUTANTS THAT COME INTO CONTACT WITH THE GROUND, SHALL BE REMOVED AND DISPOSED OF AS OUTLINED IN SECTION VI.b.3 AND VI.b.6 IN THE FIELD WIDE REPORT. PLEASE REFER TO THE STORM WATER MANAGEMENT PLAN SPECIFICATION SHEET, V, VEHICLE FUELING AND MAINTENANCE IN THE APPENDIX B OF THIS REPORT FOR FURTHER GUIDANCE.
8. THE CONTRACTOR IS RESPONSIBLE TO MAINTAIN GOOD HOUSEKEEPING PRACTICES ON THE CONSTRUCTION SITE. THIS INCLUDES THE FOLLOWING:
 - GARBAGE/TRASH/CONSTRUCTION DEBRIS SHALL BE REMOVED ON A REGULAR BASIS.
 - WASHING OF EQUIPMENT INTO EXISTING DRAINAGEWAYS IS PROHIBITED.
 - PROPER CLEANUP PROCEDURES SHALL BE USED FOR SPILLED MATERIALS.
 - CLEANUP OF DRIPS OR LEAKS FROM EQUIPMENT OR MACHINERY AT THE SITE.
 - MINIMIZING THE AMOUNT OF UNNEEDED MATERIALS STORED ON-SITE.
 - MARK LOCATIONS FOR SPILL CLEANUP EQUIPMENT AND MATERIALS.
 - FERTILIZERS AND OTHER CHEMICALS ARE APPLIED ONLY IN THE QUANTITY REQUIRED.
 - PORTABLE TOILET FACILITIES ARE PROPERLY MAINTAINED AND PROPERLY SECURED.
 - STORAGE CONTAINERS, DRUMS, AND BAGS SHALL BE STORED AWAY FROM DIRECT TRAFFIC ROUTES TO PREVENT ACCIDENTAL SPILLS.
 - CONTAINERS SHALL BE STORED ON PALLETS OR SIMILAR DEVICES TO PREVENT CORROSION OF THE CONTAINERS.
 - ALL CHEMICAL SUBSTANCES USED IN THE WORK PLACE SHALL BE LISTED WITH THE REPORTABLE QUANTITY OF EACH, AND THE MATERIAL SAFETY DATA SHEET (MSDS) OBTAINED FOR EACH. THE MSDS WILL BE READILY AVAILABLE FOR USE; I.E., POSTED AT THE LOCATIONS WHERE THE MATERIALS ARE STORED AND HANDLED. ALL CONTAINERS SHALL BE LABELED TO SHOW THE NAME AND TYPE OF SUBSTANCE, STOCK NUMBER, EXPIRATION DATE, HEALTH HAZARDS, INCLUDING REACTIVITY, CORROSIVITY, IGNITABILITY AND TOXICITY, SUGGESTIONS FOR HANDLING, AND FIRST AID INFORMATION. (THIS INFORMATION CAN USUALLY BE FOUND ON THE MSDS. UNLABELED CHEMICALS AND CHEMICALS WITH DETRIORATED LABELS ARE OFTEN DISPOSED OF UNNECESSARILY OR IMPROPERLY.)

9. NO CONCRETE IS ANTICIPATED TO BE USED IN THE CONSTRUCTION OF THIS WELL SITE PAD SO NO WASHOUT AREA IS ANTICIPATED.
10. THE STOCKPILE MUST BE A MINIMUM OF 100 FEET FROM ANY DRAINAGE WAY, AND WITH SIDE SLOPE 4:1 OR FLATTER. SOILS THAT WILL BE STOCKPILED FOR MORE THAN 30-DAYS SHALL BE SEEDED AND MULCHED WITHIN 14-DAYS OF STOCKPILE CONSTRUCTION.
11. THE PERIMETER OF THE 690'X450' PAD SITE IS CONSIDERED THE STABILIZED STAGING AREA. HOWEVER THE ENTIRE 690'X450' PAD SITE WILL BE STABILIZED WITH 6" OF GRANULAR MATERIAL.
12. THE GESC MUST REFLECT ACTUAL FIELD CONDITIONS. IT SHALL BE CONSIDERED A "LIVING DOCUMENT" THAT IS CONTINUOUSLY UPDATED AND REVISED TO REFLECT SEQUENCING OF CONSTRUCTION, REVISIONS TO DESIGN, RESPONSE TO ORIGINALLY PROPOSED BMPs NOT FUNCTIONING AS INTENDED OR NOT MEETING CAPACITY EXPECTATIONS OR FIELD CONDITIONS EXPERIENCED ARE DIFFERENT THAN ANTICIPATED.
13. IF THE SEEDING AND MULCHING APPLICATION DOES NOT PROVIDE ADEQUATE STABILIZATION FOR THE AREA WHERE SLOPES EXCEED 4:1, THEN MORE ROBUST BMPs SHOULD BE UTILIZED.
14. CAD FILES WILL BE PROVIDED TO THE SURVEYOR FOR CONSTRUCTION STAKING OF THE LIMITS OF CONSTRUCTION AND OTHER IMPROVEMENTS SHOWN HEREIN.
15. RRB AND SCL NOTE: DEGRADING IN PLACE IF FILTREXX MATERIAL (SEE GATHERING SYSTEM).



VICINITY MAP
SCALE: 1" = 8,000 FT.



KEY MAP
SCALE: 1" = 1000 FT.

SHEET INDEX	
SHEET NUMBER	SHEET TITLE
1	COVER SHEET
2	WELL PAD INITIAL-INTERIM
3	WELL PAD FINAL
4	ACCESS ROAD PLAN
5	ACCESS ROAD PLAN
6	ACCESS ROAD PROFILES
7	ACCESS ROAD PROFILES
8	RECLAMATION INITIAL-INTERIM
9	RECLAMATION FINAL
	GESC STANDARD NOTES AND DETAILS
	GESC STANDARD NOTES AND DETAILS
	GESC STANDARD NOTES AND DETAILS

LANDOWNER/AUTHORIZED AGENT SIGNATURE BLOCK

I HEREBY CERTIFY THAT THE GRADING, EROSION AND SEDIMENT CONTROL MEASURES FOR THE CRESTONE PEAK RESOURCES OPERATING LLC OIL & GAS WELL ALAMOSA 5-64 6-1 1BH, 2AH, 2BH, 3AH, 3BH, 4AH, 4BH 5-4-3 1AH, 1BH, 2AH, 2BH, 3AH, 3BH, 4AH SHALL BE CONSTRUCTED ACCORDING TO THE DESIGN PRESENTED IN THIS PLAN. I UNDERSTAND THAT ADDITIONAL EROSION CONTROL, SEDIMENT CONTROL AND WATER QUALITY ENHANCING MEASURES MAY BE REQUIRED OF THE OWNER AND HIS OR HER AGENTS DUE TO UNFORESEEN POLLUTANT DISCHARGES OR IF THE SUBMITTED PLAN DOES NOT FUNCTION AS INTENDED. THE REQUIREMENTS OF THE PLAN SHALL BE THE OBLIGATION OF THE LAND OWNER AND/OR HIS SUCCESSORS OR HEIRS; UNTIL SUCH TIME AS THE PLAN IS PROPERLY COMPLETED MODIFIED OR VOIDED.

OWNER OR AUTHORIZED AGENT: DAVID STEWART

AUTHORIZED SIGNATURE: DATE: 06-08-2021

ENGINEER SIGNATURE BLOCK

I HEREBY ATTEST THAT THIS GRADING, EROSION AND SEDIMENT CONTROL (GESC) DOCUMENT FOR CRESTONE PEAK RESOURCES OPERATING LLC OIL & GAS WELL ALAMOSA 5-64 6-1 1BH, 2AH, 2BH, 3AH, 3BH, 4AH, 4BH 5-4-3 1AH, 1BH, 2AH, 2BH, 3AH, 3BH, 4AH HAS BEEN PREPARED BY ME OR UNDER MY DIRECT SUPERVISION, AND TO THE BEST OF MY KNOWLEDGE AND ABILITY HAS BEEN PREPARED IN ACCORDANCE WITH THE LATEST VERSION OF THE ARAPAHOE COUNTY GESC MANUAL. THE SIGNATURE AND STAMP AFFIXED HEREON CERTIFIES THAT THIS GESC DOCUMENT WAS PREPARED IN ACCORDANCE WITH THE REQUIRED REGULATIONS AND CRITERIA; HOWEVER THE STAMP AND SIGNATURE DOES NOT CERTIFY OR GUARANTEE FUTURE PERFORMANCE OF THE EXECUTION OF THE PLAN BY THE CONTRACTOR. THE CONTRACTOR IS RESPONSIBLE FOR EXECUTING THE CONSTRUCTION WORK ACCORDING TO THE INFORMATION SET FORTH IN THE PLAN AND IN ACCORDANCE WITH ALL APPLICABLE REQUIREMENTS.

MELINDA E. LUNDQUIST, PE, LEED AP
COLORADO REGISTRATION 38413
WESTWOOD PROFESSIONAL SERVICES



GESC COLLATORAL

BMP COST FOR PAD PER ACRE: \$3,000 X 12.81 AC = \$38,430
BMP COST FOR ACCESS ROAD PER LINEAR FOOT: \$3 X 4,718' = \$14,154
TOTAL BMP COST: \$52,584

Arapahoe County
06/17/2021

VALID ONLY IF FIRST PAGE IS SIGNED

GRADING, EROSION, AND SEDIMENT CONTROL IMPROVEMENTS ONLY

THESE GESC PLANS HAVE BEEN REVIEWED BY ARAPAHOE COUNTY FOR GRADING, EROSION, AND SEDIMENT CONTROL IMPROVEMENTS ONLY

DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT APPROVAL BLOCK

BENCHMARK 374 LOCATED ON THE SECTION LINE BETWEEN SECTIONS 12 AND 13, T5S, R64W, 6TH P.M., TAKEN FROM 1988 PUBLISHED DATUM BY THE UNITED STATES DEPARTMENT OF THE INTERIOR, GEOLOGICAL SURVEY AS BEING 6054.61 FEET.

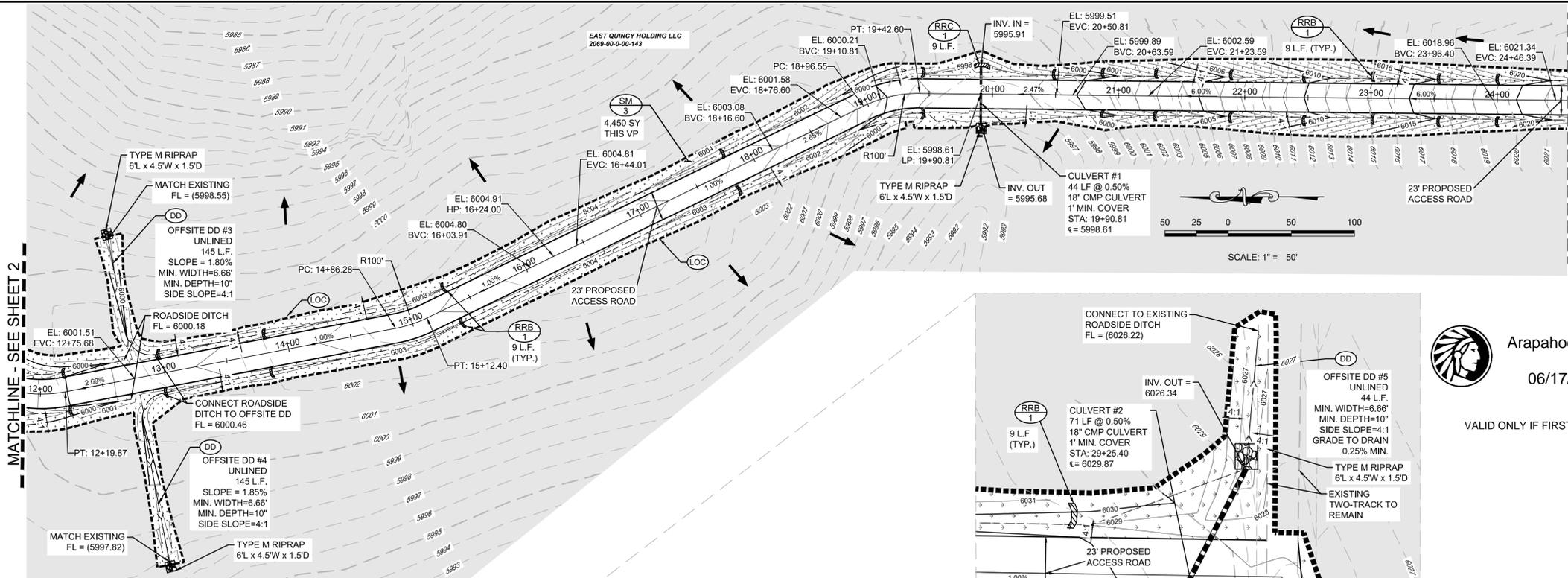
CALL 811
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UNCC 1-800-922-1987

SHEET NUMBER	DRAWN BY	CHECKED BY	DATE	Revisions	
				No.	Date
1	KRW	MEL	06-28-21		
2					
3					
4					
5					
6					
7					
8					
9					

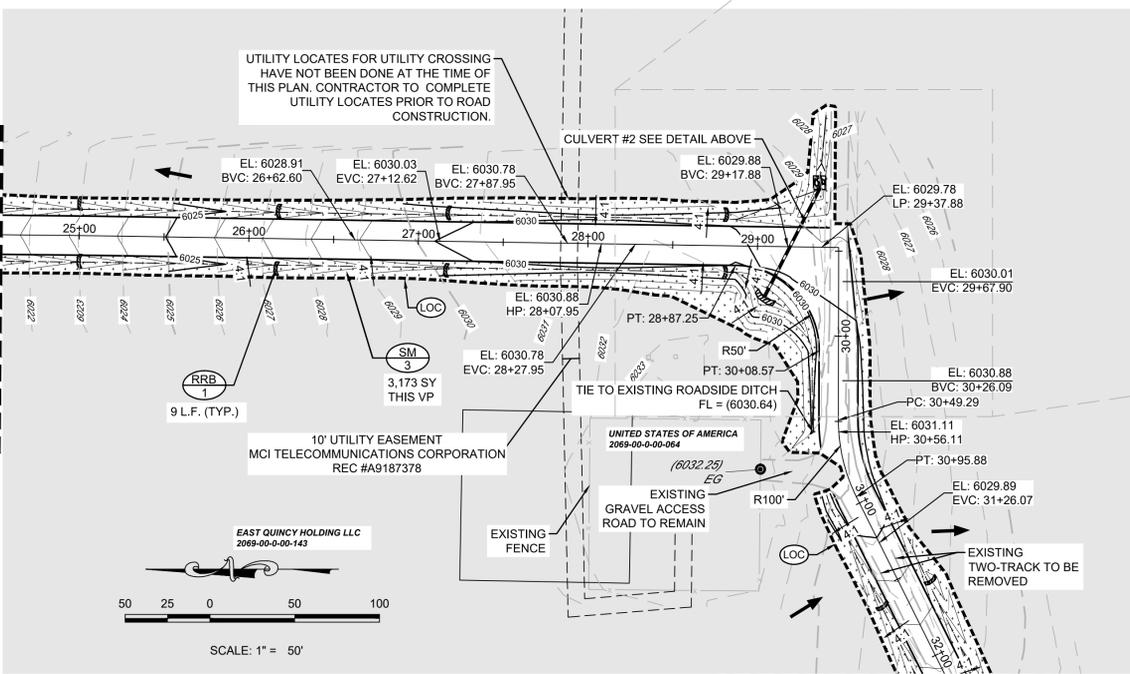
10333 E. Dry Creek Rd.
Suite 240
Englewood, CO 80112
Tel: (720) 482-9526
Fax: (720) 482-9546

CRESTONE PEAK RESOURCES OPERATING LLC
ATTN: KATHY DENZER
34501 E. QUINCY AVE. BUILDING 1
WATKINS, CO 80137
PHONE: (720) 410-8519

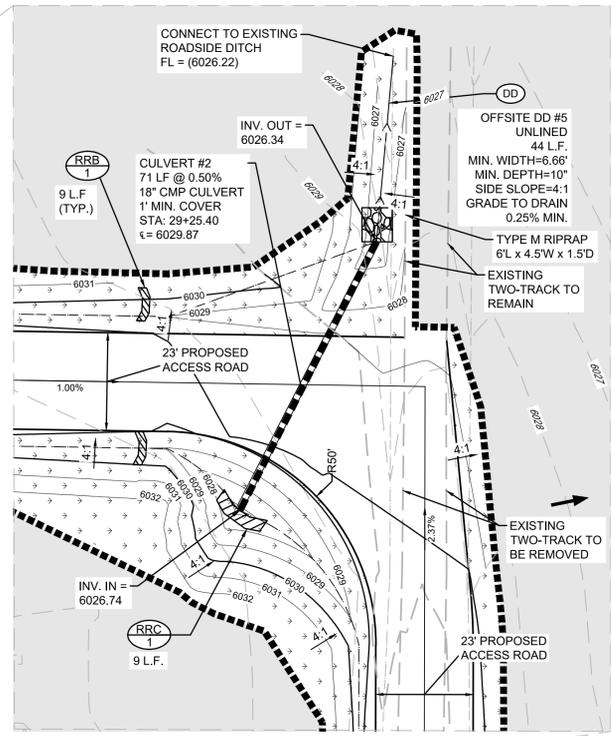
CML a Westwood team



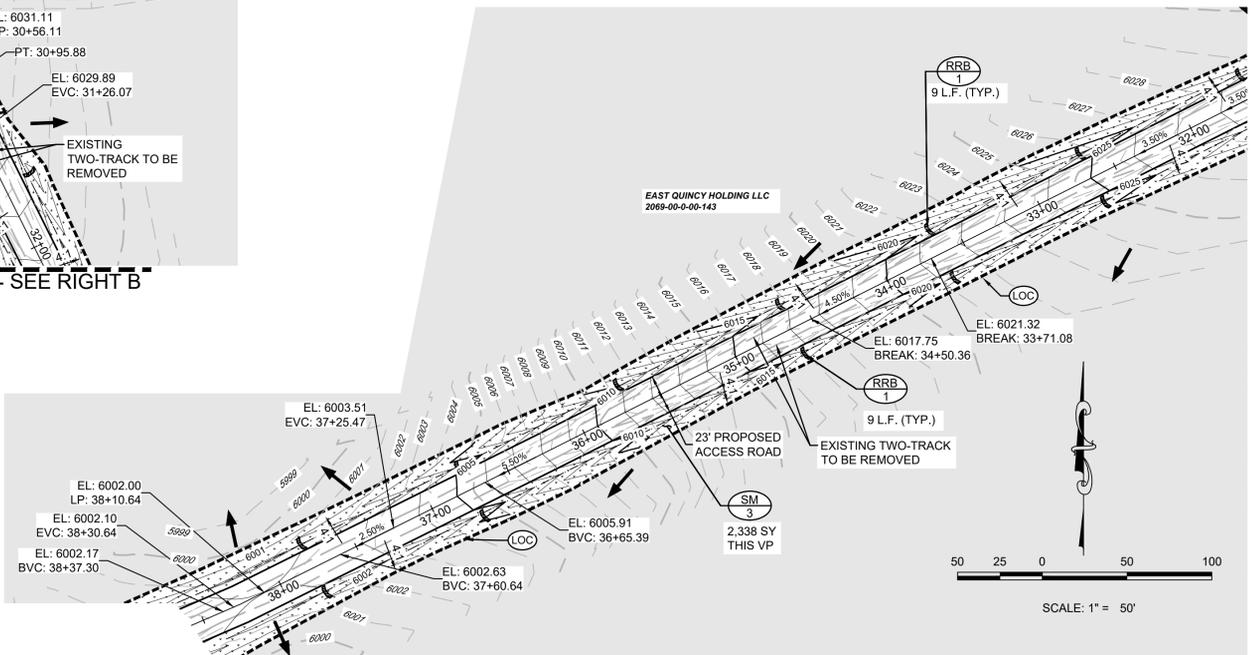
PLAN: ACCESS ROAD STA: 12+00 TO 24+50



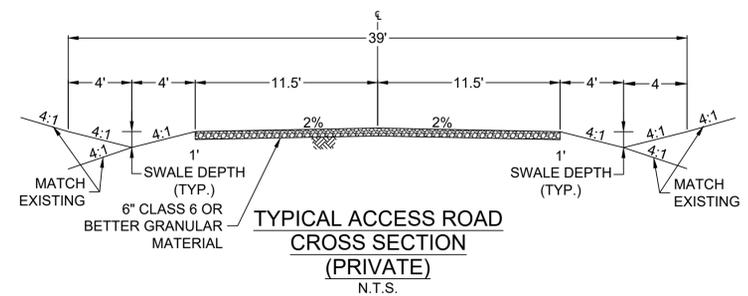
PLAN: ACCESS ROAD STA: 24+50 TO 32+00



PLAN: ACCESS ROAD STA: BLOW UP
1" = 20'



PLAN: ACCESS ROAD STA: 32+00 TO 38+50



TYPICAL ACCESS ROAD CROSS SECTION (PRIVATE)
N.T.S.

MATCHLINE - SEE BELOW LEFT A

MATCHLINE - SEE SHEET 2

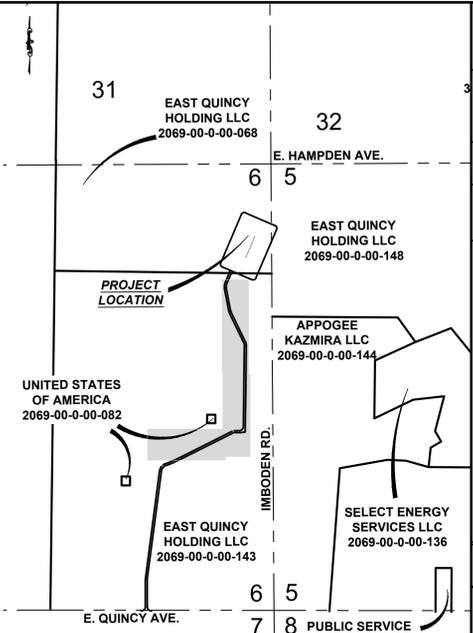
MATCHLINE - SEE ABOVE RIGHT A

MATCHLINE - SEE RIGHT B

MATCHLINE - SEE LEFT B

MATCHLINE - SEE SHEET 5

Arapahoe County
06/17/2021
VALID ONLY IF FIRST PAGE IS SIGNED



KEY MAP
SCALE 1" = 1000'

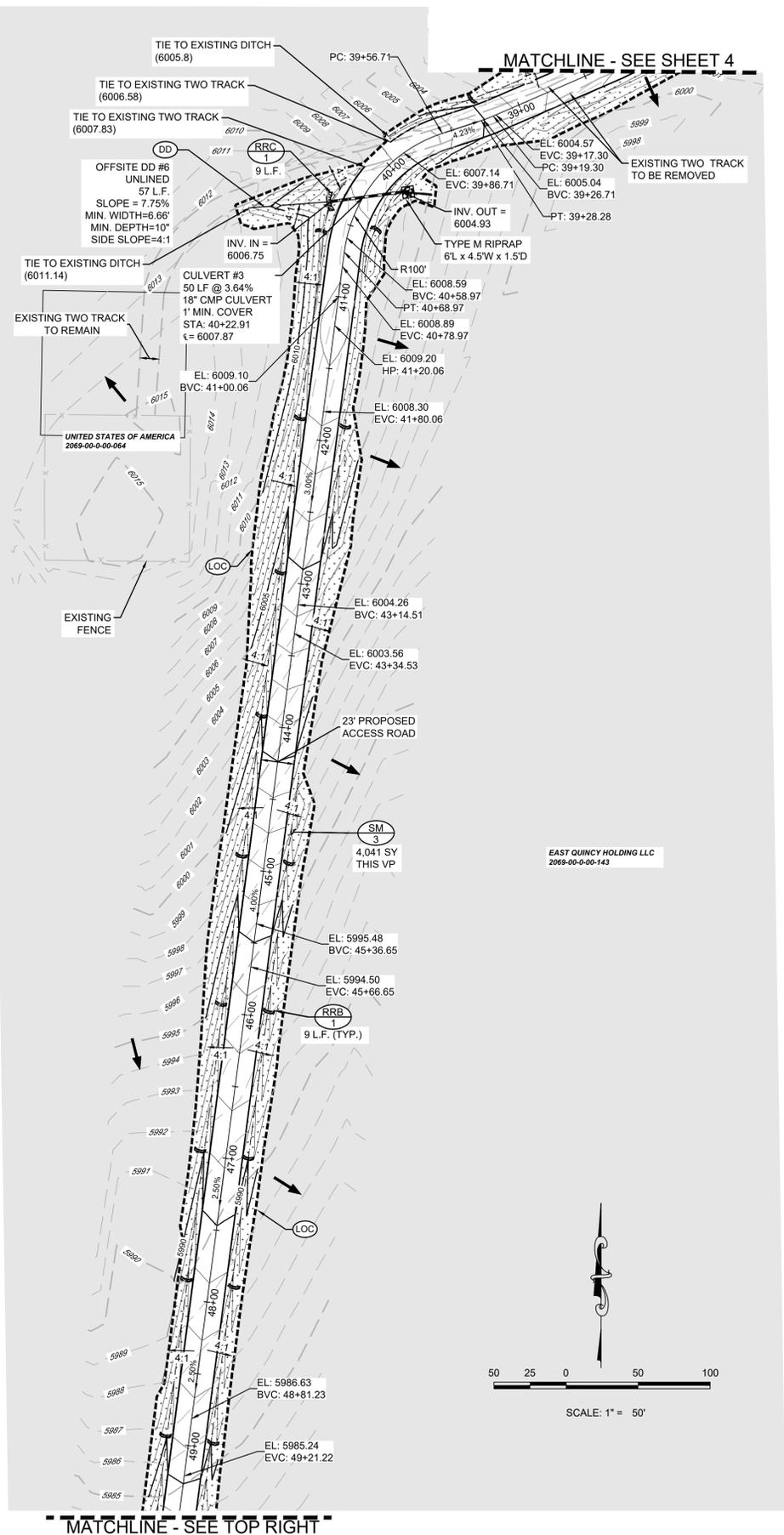
NO.	NO.	LEGEND
1	(1)	CBC CUT BACK CURB
2	(1)	CD CHECK DAM
3	(1)	CWA CONCRETE WASHOUT AREA
4	(1)	CF CONSTRUCTION FENCE
5	(1)	CM CONSTRUCTION MARKERS
6	(1)	CS CURB SOCK
7	(1)	DW DEWATERING
8	(2)	DD DIVERSION DITCH
9	(2)	ECB EROSION CONTROL BLANKET
10	(2)	GMS GROUT MIXING STATION
11	(2)	IP INLET PROTECTION
12	(2)	RCD REINFORCED CHECK DAM
13	(2)	RRB REINFORCED ROCK BERM
14	(2)	RRC RRB FOR CULVERT PROTECTION
15	(2)	SB SEDIMENT BASIN
16	(3)	SCL SEDIMENT CONTROL LOG
17	(3)	ST SEDIMENT TRAP
18	(3)	SM SEEDING AND MULCHING
19	(3)	SF SILT FENCE
20	(3)	SID SLOPE INTERCEPT DITCH
21	(3)	SSA STABILIZED STAGING AREA
22	(4)	SR SURFACE ROUGHENING
23	(4)	TSD TEMPORARY SLOPE DRAIN
24	(4)	TSC TEMPORARY STREAM CROSSING
25	(4)	VTC VEHICLE TRACKING CONTROL
26	(4)	WW VTC WITH WHEEL WASH
		LOC ROCK AND RIPRAP GRADATIONS LIMITS OF CONSTRUCTION
		*EG MAY MEET MAJOR MODIFICATION REQUIREMENTS
		AREA OUTSIDE OF LIMITS OF CONSTRUCTION, LOC

BMP TYPE
1. INITIAL
2. INTERIM
3. FINAL

SCALE: AS SHOWN
FILE NO: 8.13.0302822
DRAWN BY: KRW
CHECKED BY: MEL
DATE: 04-28-21

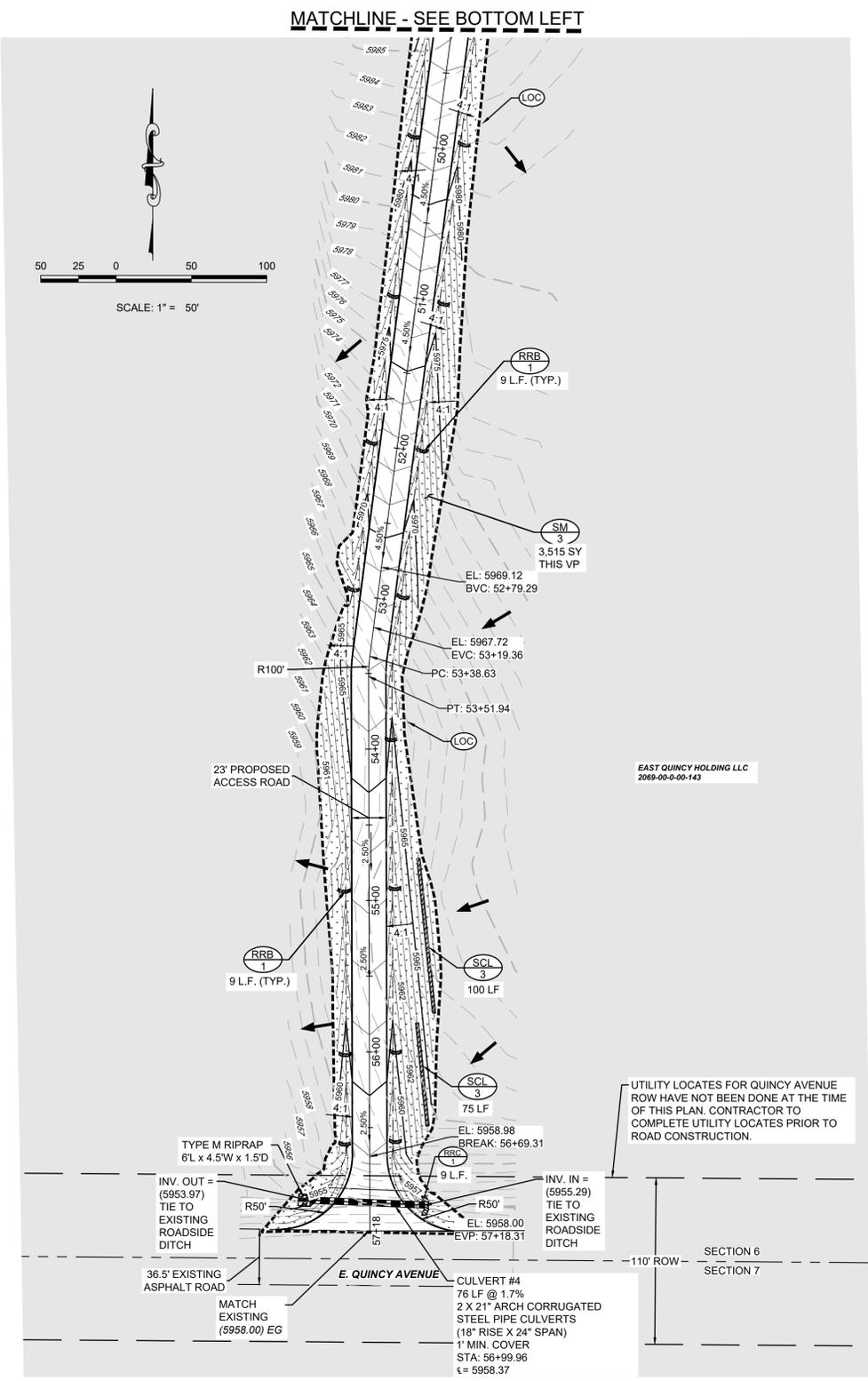
UNICC 1-800-922-1987

10333 E. Dry Creek Rd. Suite 240 Englewood, CO 80112 Tel: (720) 482-9546 Fax: (720) 482-9546	Date
 CRESTONE PEAK RESOURCES OPERATING LLC ATTN: KATHY DENZER 34501 E. QUINCY AVE., BUILDING 1 PHONE: (720) 410-5819	Revisions
	No.
ALAMOSA 5-64 6-1 1BH, 2AH, 2BH, 3AH, 3BH, 4AH, 4BH, 5-4-3 1AH, 1BH, 2AH, 2BH, 3AH, 3BH, 4AH GESC PLANS	Appr.
ACCESS ROAD PLAN	Date
SHEET NUMBER	4

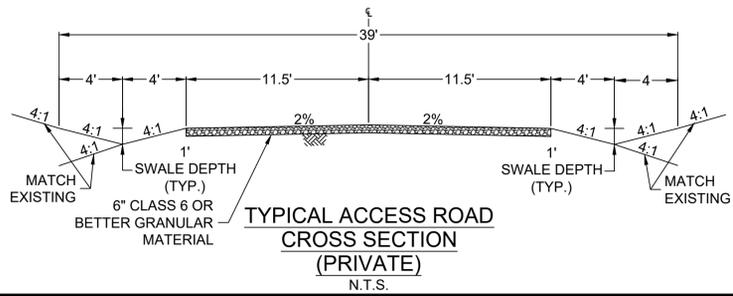


PLAN: ACCESS ROAD STA: 38+50 TO 49+50

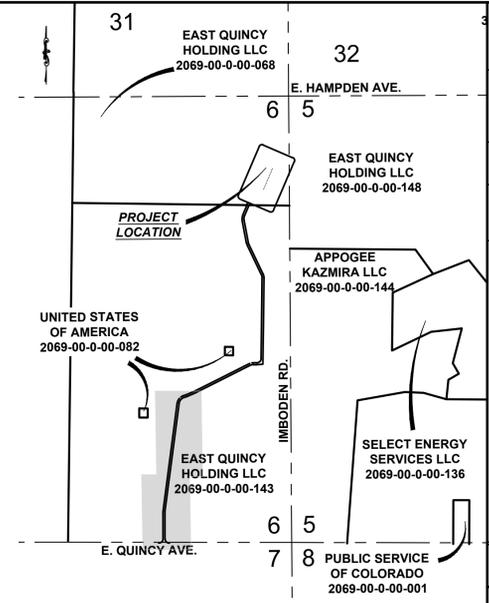
ARAPAHOE COUNTY CASE NUMBER: AE20-002



PLAN: ACCESS ROAD STA: 49+50 TO 57+18



TYPICAL ACCESS ROAD CROSS SECTION (PRIVATE) N.T.S.



KEY MAP SCALE 1" = 1000'

NO.	NO.	LEGEND
1	(1)	CBC CUT BACK CURB
2	(1)	CD CHECK DAM
3	(1)	CWA CONCRETE WASHOUT AREA
4	(1)	CF CONSTRUCTION FENCE
5	(1)	CM CONSTRUCTION MARKERS
6	(1)	CS CURB SOCK
7	(1)	DW DEWATERING
8	(2)	DD DIVERSION DITCH
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10	(2)	GMS GROUT MIXING STATION
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17	(3)	ST SEDIMENT TRAP
18	(3)	SM SEEDING AND MULCHING
19	(3)	SF SILT FENCE
20	(3)	SID SLOPE INTERCEPT DITCH
21	(3)	SSA STABILIZED STAGING AREA
22	(4)	SR SURFACE ROUGHENING
23	(4)	TSD TEMPORARY SLOPE DRAIN
24	(4)	TSC TEMPORARY STREAM CROSSING
25	(4)	VTC VEHICLE TRACKING CONTROL
26	(4)	WW VTC WITH WHEEL WASH
		LOC ROCK AND RIPRAP GRADATIONS LIMITS OF CONSTRUCTION
		*EG MAY MEET MAJOR MODIFICATION REQUIREMENTS
		AREA OUTSIDE OF LIMITS OF CONSTRUCTION, LOC

Arapahoe County
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BENCH MARK 374 LOCATED ON THE SECTION LINE BETWEEN SECTIONS 12 AND 13, T5S, R64W, 6TH P.M., TAKEN FROM 1988 PUBLISHED DATUM BY THE UNITED STATES DEPARTMENT OF THE INTERIOR, GEOLOGICAL SURVEY AS BEING 6054.61 FEET.

CALL 811 TWO WORKING DAYS BEFORE YOU DIG
 UNCC 1-800-922-1987

No.	Revisions	Date	Appr.	Date

10333 E. Dry Creek Rd. Suite 240 Englewood, CO 80112 Tel: (303) 482-9546 Fax: (720) 482-9546

CML a Westwood team

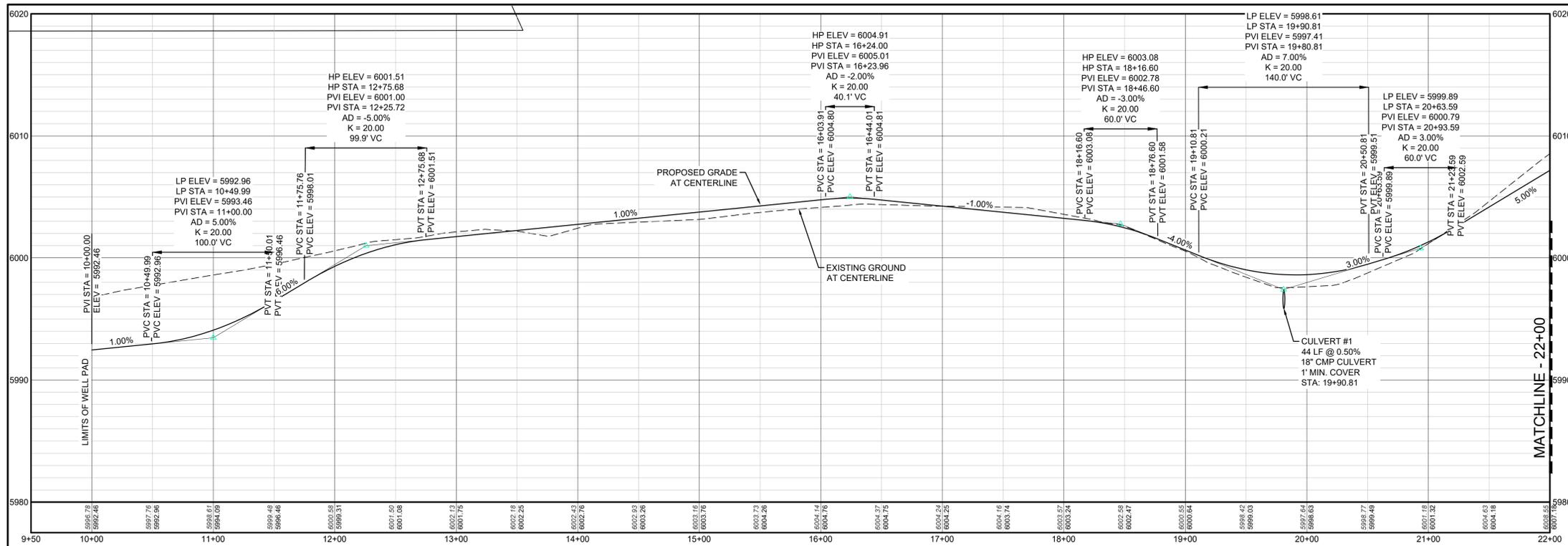
CRESTONE PEAK RESOURCES OPERATING LLC ATTN: KATHY DENZER 34501 E. QUINCY AVE. BUILDING 1 PHONE: (720) 410-8819

ALAMOSA 5-64 6-1 1BH, 2AH, 2BH, 3AH, 3BH, 4AH, 4BH, 5-4-3 1AH, 1BH, 2AH, 2BH, 3AH, 3BH, 4AH GESC PLANS

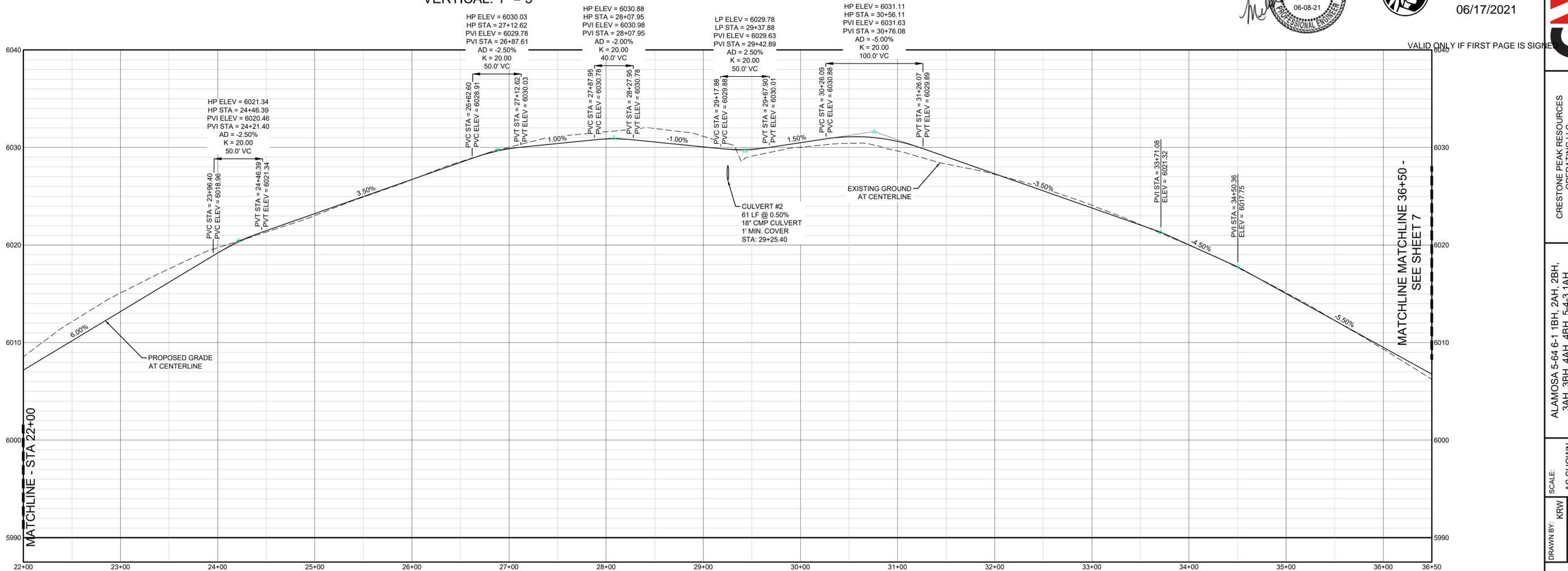
ACCESS ROAD PLAN

SCALE: AS SHOWN FILE NO.: 8.13.0302822
 DRAWN BY: KRW CHECKED BY: MEL DATE: 04-28-21

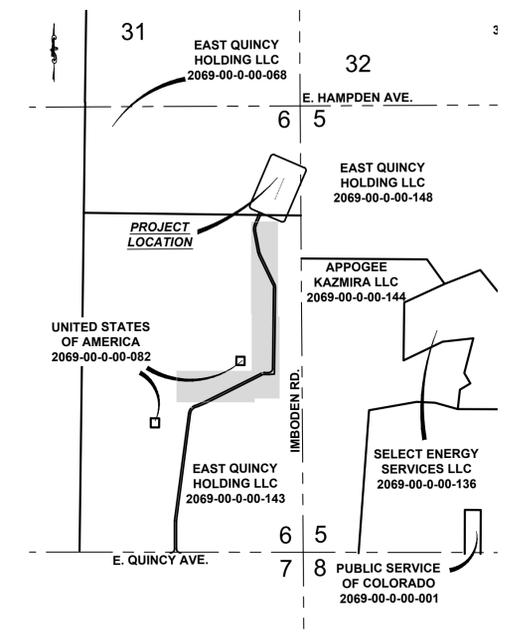
SHEET NUMBER **5**



PROFILE: ACCESS ROAD CL STA: 9+50.00 TO 22+00.00
 HORIZONTAL: 1" = 50'
 VERTICAL: 1" = 5'



PROFILE: ACCESS ROAD CL STA: 22+00.00 TO 36+50.00
 HORIZONTAL: 1" = 50'
 VERTICAL: 1" = 5'



NOTE: INFORMATION FOR APPLICANT ONLY,
 SHEET IS NOT APPLICABLE TO COUNTY APPROVAL

Professional Engineer Seal: Colorado License No. 38413, Exp. 06-08-21. Signature of M. D. [unreadable].
 Arapahoe County
 06/17/2021

ARAPAHOE COUNTY CASE NUMBER: AE20-002

CALL 811
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 UNCC 1-800-922-1987

No.	Revisions	Date	Appr.	Date

10333 E. Dry Creek Rd.
 Suite 240
 Englewood, CO 80112
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CML a Westwood team

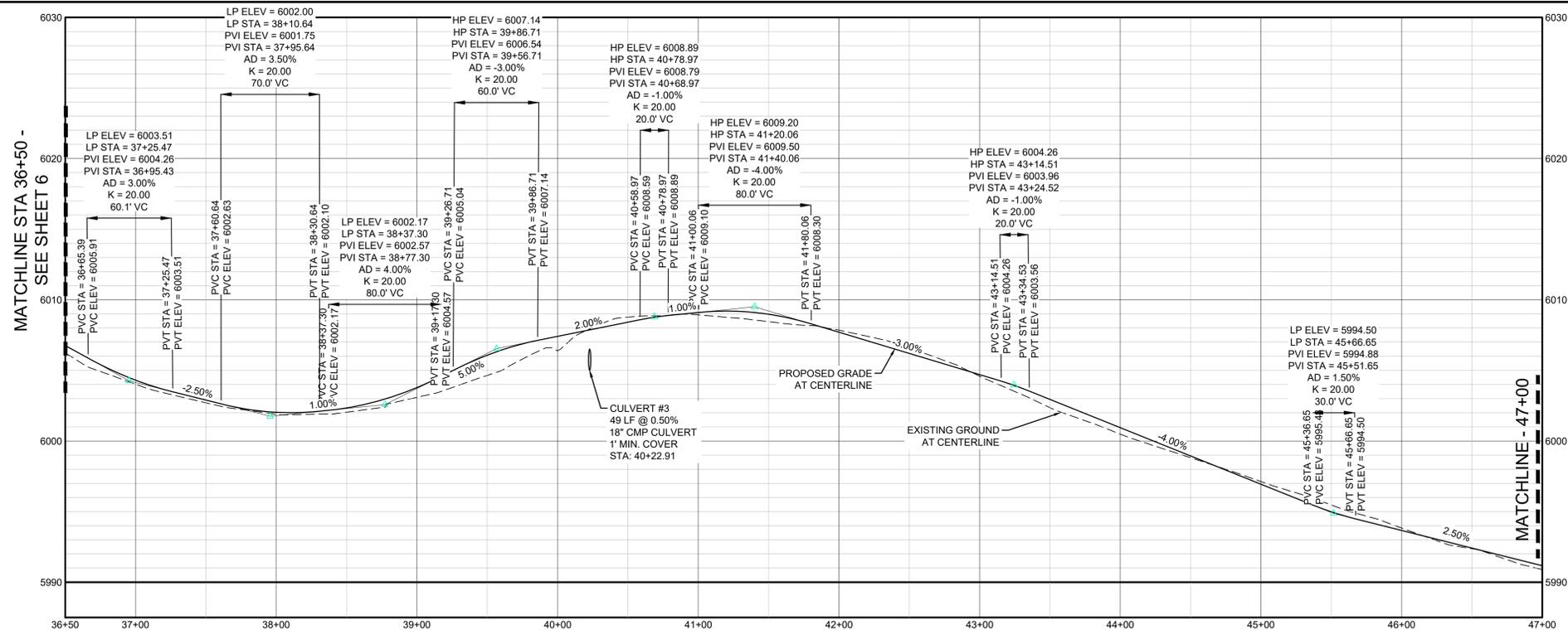
CRESTONE PEAK RESOURCES
 OPERATING LLC
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 34501 E. QUINCY AVE., BUILDING 1
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ALAMOSA 5-64 6-1, 1BH, 2AH, 2BH, 3AH, 3BH, 4AH, 4BH, 5-4-3 1AH, 1BH, 2AH, 2BH, 3AH, 3BH, 4AH
 GESC PLANS
 ACCESS ROAD PROFILES

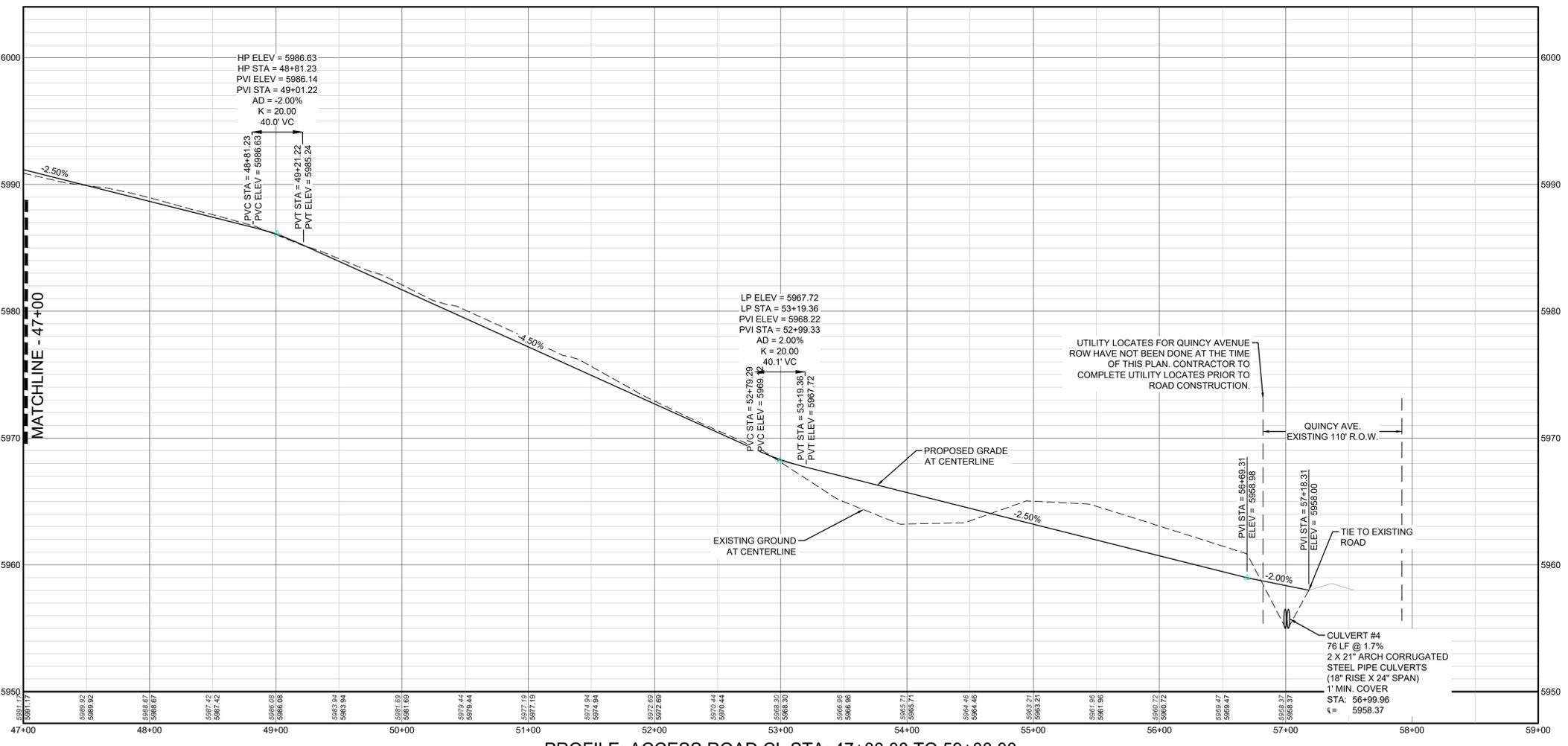
DRAWN BY: KRW
 CHECKED BY: MEL
 DATE: 04-28-21

SCALE: AS SHOWN
 FILE NO: 8.13.0302822

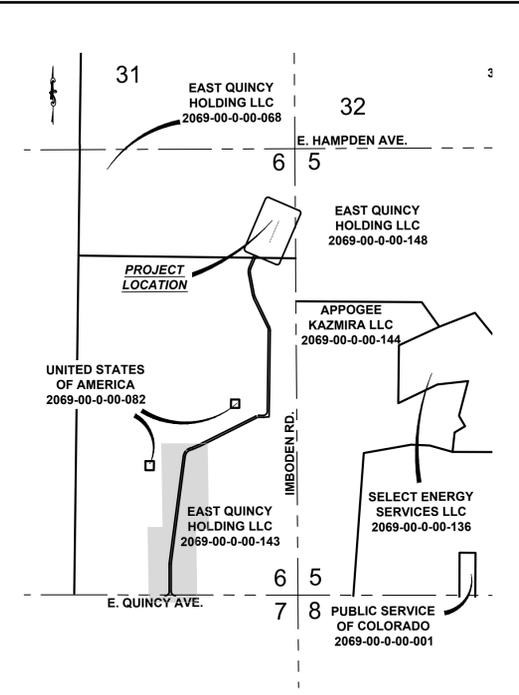
SHEET NUMBER: 6



PROFILE: ACCESS ROAD CL STA: 36+50.00 TO 47+00.00
 HORIZONTAL: 1" = 50'
 VERTICAL: 1" = 5'



PROFILE: ACCESS ROAD CL STA: 47+00.00 TO 59+00.00
 HORIZONTAL: 1" = 50'
 VERTICAL: 1" = 5'



NOTE: INFORMATION FOR APPLICANT ONLY.
 SHEET IS NOT APPLICABLE TO COUNTY APPROVAL

ARAPAHOE COUNTY CASE NUMBER: AE20-002

Arapahoe County
 06/17/2021

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BENCH MARK
 BENCHMARK 374 LOCATED ON THE SECTION LINE
 BETWEEN SECTIONS 12 AND 13, T5S, R64W, 6TH
 P.M., TAKEN FROM 1988 PUBLISHED DATUM BY THE
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ALAMOSA 5-64 6-1 1BH, 2AH, 2BH,
 3AH, 3BH, 4AH, 4BH, 5-4-3 1AH,
 1BH, 2AH, 2BH, 3AH, 3BH, 4AH
 GESC PLANS
 ACCESS ROAD PROFILES

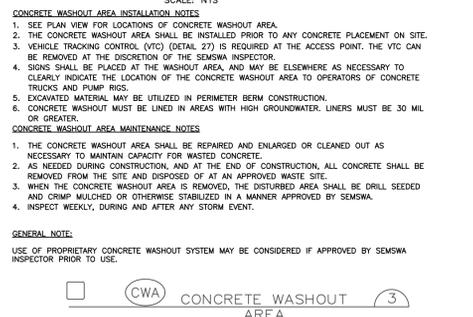
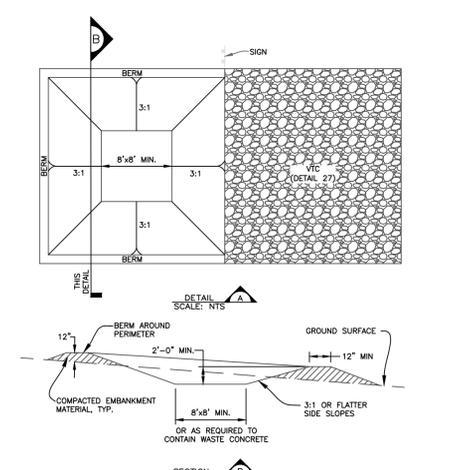
DRAWN BY: KRW
 CHECKED BY: MEL
 DATE: 04-28-21

SCALE: AS SHOWN
 FILE NO: 8.13.0302822

SHEET NUMBER 7

- GRADING, EROSION, AND SEDIMENT CONTROL (GESC) GENERAL NOTES**
- THE SOUTHEAST METRO STORMWATER AUTHORITY (SEMWA) LAND DEVELOPMENT REVIEW MANAGER SIGNATURE APPLIED TO THIS DOCUMENT INDICATES SEMWA HAS REVIEWED THE DOCUMENT AND FOUND IT IN GENERAL COMPLIANCE WITH CENTENNIAL'S LAND DEVELOPMENT CODE AND/OR THE GRADING, EROSION AND SEDIMENT CONTROL (GESC) MANUAL. THE LAND DEVELOPMENT REVIEW MANAGER THROUGH ACCEPTANCE OF THIS DOCUMENT, ASSUMES NO RESPONSIBILITY (OTHER THAN AS STATED ABOVE) FOR THE COMPLETENESS AND/OR ACCURACY OF THESE DOCUMENTS.
 - THE ADEQUACY OF THIS GESC PLAN LIES WITH THE ORIGINAL DESIGN ENGINEER. CHANGES TO DESIGN INTENT THAT MEET THE DEFINITION OF MAJOR MODIFICATIONS MUST GO THROUGH ORIGINAL DESIGN ENGINEER.
 - THE GESC PLAN SHALL BE CONSIDERED VALID FOR TWO (2) YEARS FROM THE DATE OF ACCEPTANCE BY SEMWA. AFTER WHICH TIME THE PLAN SHALL BE VOID AND WILL BE SUBJECT TO RE-REVIEW AND RE-ACCEPTANCE BY SEMWA. PLANS MUST CONFORM TO CURRENT REQUIREMENTS.
 - ALL MATERIALS AND WORKMANSHIP SHALL BE SUBJECT TO INSPECTION BY SEMWA'S INSPECTION DIVISION. SEMWA RESERVES THE RIGHT TO ACCEPT OR REJECT ANY SUCH MATERIALS AND WORKMANSHIP THAT DOES NOT CONFORM TO THE GESC MANUAL, GESC PLAN OR GESC PERMIT.
 - THE PLACEMENT OF EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IN ACCORDANCE WITH THE ACCEPTED GESC PLAN AND THE SEMWA GESC MANUAL.
 - ANY VARIATION IN MATERIAL, TYPE OR LOCATION OF EROSION AND SEDIMENT CONTROL MEASURES FROM THE SEMWA - ACCEPTED GESC PLAN WILL REQUIRE APPROVAL FROM AN ACCOUNTABLE REPRESENTATIVE OF SEMWA.
 - UPON RECEIVING THE APPROVED, SIGNED AND STAMPED GESC PLANS AND REPORT, THE CONTRACTOR MAY INSTALL THE NON-EARTH DISTURBING INITIAL-STAGE EROSION AND SEDIMENT CONTROL MEASURES INDICATED ON THE ACCEPTED GESC PLAN.
 - AFTER INSTALLATION OF THE INITIAL-STAGE EROSION AND SEDIMENT CONTROL MEASURES, THE PERMITTEE SHALL CALL THE INSPECTION DIVISION TO SCHEDULE A PRECONSTRUCTION MEETING AT THE PROJECT SITE. THE REQUEST SHALL BE MADE NO LESS THAN 24 HOURS PRIOR TO THE REQUESTED MEETING TIME. NO CONSTRUCTION ACTIVITIES SHALL BE PLANNED WITHIN 24 HOURS AFTER THE PRECONSTRUCTION MEETING.
 - IN ADDITION TO THE SEMWA INSPECTOR AND GESC MANAGER, THE FOLLOWING REPRESENTATIVES SHOULD ATTEND: GENERAL CONTRACTOR, OWNER, OR OWNER'S REPRESENTATIVE AND GRADING SUBCONTRACTOR. IF ANY OF THE REQUIRED PARTICIPANTS FAIL TO ATTEND THE PRECONSTRUCTION MEETING, THE CONTRACTOR'S INITIAL CONTROL MEASURES ARE NOT APPROVED BY THE SEMWA INSPECTOR. THE APPLICANT WILL HAVE TO PAY A RESUBMISSION FEE, ADDRESS ANY PROBLEMS WITH CONTROL MEASUREMENTS, AND CALL TO RESCHEDULE THE MEETING, WITH A CORRESPONDING DELAY IN THE START OF CONSTRUCTION.
 - CONSTRUCTION SHALL NOT BEGIN UNTIL THE SEMWA INSPECTOR APPROVES THE INSTALLATION OF THE INITIAL CONTROL MEASURES AND THE APPROVED GESC PERMIT HAS BEEN ISSUED BY SEMWA AND IS IN-HAND ON THE SITE. THE COMPLETED PERMIT WILL GENERALLY BE FILED OR ISSUED VIA EMAIL AFTER THE INSTALLATION OF THE INITIAL CONTROL MEASURES ARE APPROVED.
 - THE GESC MANAGER SHALL STRICTLY ADHERE TO THE SEMWA APPROVED LIMITS OF CONSTRUCTION AT ALL TIMES. THE SEMWA INSPECTOR MUST APPROVE ANY CHANGES TO THE LIMITS OF CONSTRUCTION AND, AT THE DISCRETION OF THE INSPECTION DIVISION, ADDITIONAL EROSION/SEDIMENT CONTROLS MAY BE REQUIRED IN ANY ADDITIONAL AREAS OF CONSTRUCTION/DISTURBANCE ARE NEEDED.
 - THE MAXIMUM AREA OF CONSTRUCTION SHALL BE LIMITED TO 40 ACRES (70 ACRES IF APPROVED FOR SOIL MITIGATION OPERATIONS) TO REDUCE THE AMOUNT OF LAND DISTURBED AT ANY ONE TIME. LARGER SITES SHALL BE DIVIDED INTO PHASES THAT ARE EACH 40 (OR 70) ACRES OR LESS IN SIZE. THESE PROJECTS SHALL CONDUCT GRADING ACTIVITIES IN ACCORDANCE WITH THE ACCEPTED GESC PLAN, CONTROL MEASURES, AND INSTALLATION AND APPROVAL BY SEMWA AT THE START AND COMPLETION OF EACH PHASE SHALL BE CONDUCTED IN ACCORDANCE WITH THE PROCEDURES LISTED IN THE GESC MANUAL.
 - NATURAL VEGETATION SHALL BE RETAINED AND PROTECTED WHEREVER POSSIBLE. EXPOSURE OF SOIL TO EROSION BY REMOVAL OR DISTURBANCE OF VEGETATION SHALL BE LIMITED TO THE AREA REQUIRED FOR IMMEDIATE CONSTRUCTION OPERATIONS.
 - THE GESC PERMIT SHALL BE VALID FOR A PERIOD OF TWO (2) YEARS.
 - A COPY OF THE GESC PERMIT AND APPROVED GESC PLANS SHALL BE ON SITE OR MADE AVAILABLE UPON REQUEST.
 - THE GESC MANAGER SHALL BE RESPONSIBLE PARTY FOR ENSURING THAT THE SITE REMAINS IN COMPLIANCE WITH THE GESC PERMIT AND SHALL BE THE PERMITTEE'S CONTACT PERSON WITH SEMWA FOR ALL MATTERS PERTAINING TO THE GESC PERMIT. THE GESC MANAGER SHALL BE ON THE SITE AT ALL TIMES TO ENSURE THE GESC REQUIREMENTS ARE BEING IMPLEMENTED, AND (ALONG WITH THE ALTERNATE GESC MANAGER) SHALL PROVIDE SEMWA WITH 24-HOUR EMERGENCY CONTACT NUMBERS. THE GESC MANAGER SHALL BE RESPONSIBLE FOR NOTIFYING SEMWA IMMEDIATELY IN WRITING OF ANY VIOLATION. THE ALTERNATE GESC MANAGER SHALL BE CONTACTED, IF NEITHER THE GESC MANAGER NOR ALTERNATE GESC MANAGER CAN BE CONTACTED DURING ANY VIOLATION, WITHIN 24 HOURS. VIOLATION MAY BE ISSUED TO THE PERMITTEE(S).
 - ALL CONSTRUCTION TRAFFIC MUST EXIT THE SITE THROUGH THE SEMWA-APPROVED ACCESS POINT. A VEHICLE TRACKING CONTROL PAD IS REQUIRED AT ALL EXIT POINTS ON THE SITE. ADDITIONAL STABILIZED CONSTRUCTION ENTRANCES MAY BE ADDED WITH AUTHORIZATION FROM THE SEMWA INSPECTION DIVISION.
 - THE GESC MANAGER IS RESPONSIBLE FOR CLEANUP OF SEDIMENT OR CONSTRUCTION DEBRIS TRACKED ONTO ADJACENT PAVED AREAS. PAVED AREAS INCLUDING STREETS ARE TO BE KEPT CLEAN THROUGHOUT BUILD-OUT AND SHALL BE CLEANED WITH A STREET SWEEPER OR SIMILAR DEVICE. AT FIRST NOTICE OF ACCIDENTAL TRACKING OR AT THE DISCRETION OF THE SEMWA GESC INSPECTOR, STREET WASHING IS NOT ALLOWED. SEMWA RESERVES THE RIGHT TO REQUIRE ADDITIONAL MEASURES TO ENSURE AREA STREETS ARE KEPT FREE OF SEDIMENT AND/OR CONSTRUCTION DEBRIS.
 - APPROVED EROSION AND SEDIMENT CONTROL MEASURES SHALL BE MAINTAINED AND KEPT IN GOOD REPAIR FOR THE DURATION OF THIS PROJECT. AT A MINIMUM, THE GESC MANAGER SHALL INSPECT ALL CONTROL MEASURES IN ACCORDANCE WITH THE GESC PLAN AND GESC MANUAL. ALL NEW CONSTRUCTION, CONTROL MEASURES, AND REPAIR ACTIVITIES SHALL BE COMPLETED WITHIN 48 HOURS. ACCUMULATED SEDIMENT AND CONSTRUCTION DEBRIS SHALL BE REMOVED AND PROPERLY DISPOSED.
 - STRAW BALES ARE NOT A SEMWA GESC-ACCEPTED SEDIMENT CONTROL MEASURE.
 - TOPSOIL SHALL BE STRIPPED AND STOCKPILED IN THE LOCATION SHOWN ON THE ACCEPTED GESC PLAN. THE TOPSOIL (STOCKPILES) SHALL FOLLOW ALL STOCKPILING CRITERIA DESCRIBED IN THE GESC MANUAL. TOPSOIL SHALL BE REPLACED AT A MINIMUM OF 6 INCHES IN A MANNER AND DEPTH OF 6 INCHES. TOPSOIL SHALL BE OBTAINED, ADDITIONAL TOPSOIL AND/OR APPROVED SOIL AMENDMENTS WILL BE REQUIRED TO BE PLACED PRIOR TO SEEDING AND MULCHING.
 - THE ACCEPTED GESC PLAN MAY REQUIRE CHANGES OR ALTERATIONS AFTER APPROVAL TO MEET CHANGING SITE OR PROJECT CONDITIONS OR TO ADDRESS INEFFICIENCIES IN DESIGN OR INSTANT GESC MANAGER SHALL OBTAIN PRIOR APPROVAL FOR MAJOR MODIFICATIONS FROM THE DESIGN ENGINEER AND SEMWA FOR ANY PROPOSED CHANGES.
 - LINING OF TEMPORARY SMALES AND DITCHES SHALL BE IN ACCORDANCE WITH THE GESC MANUAL.
 - ANY SETTLEMENT OR SOIL ACCUMULATIONS BEYOND THE LIMITS OF CONSTRUCTION DUE TO GRADING OR EROSION SHALL BE REPAIRED IMMEDIATELY BY THE GESC MANAGER. THE GESC MANAGER SHALL BE HELD RESPONSIBLE FOR OBTAINING ACCESS IMMEDIATELY TO NEARBY AND ADJACENT WATERSHEDS. THE GESC MANAGER SHALL BE HELD RESPONSIBLE FOR ADJACENT WATERWAYS, WETLANDS, PROPERTIES, ETC. RESULTING FROM WORK DONE AS PART OF THIS PROJECT.
 - A WATER SOURCE SHALL BE AVAILABLE ON SITE DURING EARTHWORK OPERATIONS AND UTILIZED AS REQUIRED TO MINIMIZE DUST FROM EARTHWORK EQUIPMENT AND MACHINERY.
 - SOILS THAT WILL BE STOCKPILED FOR MORE THAN THIRTY (30) DAYS SHALL BE SEEDED AND MULCHED WITHIN FOURTEEN (14) DAYS OF STOCKPILE CONSTRUCTION. NO STOCKPILES SHALL BE PLACED WITHIN ONE HUNDRED (100) FEET OF A DRAINAGE WAY UNLESS APPROVED BY SEMWA.
 - ALL CHEMICAL OR HAZARDOUS MATERIALS WHICH ENTER WATERS OF THE STATE OF COLORADO, WHICH INCLUDE BUT ARE NOT LIMITED TO, SURFACE WATER, GROUND WATER AND DRY GULLIES OR STORM SEWER LEADING TO SURFACE WATER, SHALL BE IMMEDIATELY REPORTED TO THE COPIE PER CRS 25-8-601, AND SEMWA. RELEASES OF PETROLEUM PRODUCTS AND CERTAIN HAZARDOUS SUBSTANCES LISTED UNDER THE FEDERAL CLEAN WATER ACT (40 CFR PART 116) MUST BE REPORTED TO THE NATIONAL RESPONSE CENTER AS WELL AS THE COPIE. CONTACT INFORMATION FOR COPIE, SEMWA AND THE NATIONAL RESPONSE CENTER CAN BE FOUND IN APPENDIX A. SPILLS THAT POSE AN IMMEDIATE RISK TO HUMAN LIFE SHALL BE REPORTED TO 911. FAILURE TO REPORT AND CLEAN UP ANY SPILLS SHALL RESULT IN ISSUANCE OF A STOP WORK ORDER. TO REPORT SPILLS TO SEMWA CALL 303-858-8844.
 - ALL WORK ON SITE SHALL STAY A MINIMUM OF ONE HUNDRED (100) FEET AWAY FROM ANY DRAINAGE WAY, WETLAND, ETC. UNLESS OTHERWISE NOTED ON AN ACCEPTED SEMWA GESC PLAN.
 - THE USE OF REBAR, STEEL STAKES STAPLES, OR STEEL FENCE POSTS FOR STAKING OR SUPPORT OF ANY EROSION OR SEDIMENT CONTROL MEASURE IS PROHIBITED (EXCEPT STEEL TEE-POSTS FOR USE IN SUPPORTING CONSTRUCTION FENCE).
 - THE CLEANING OF CONCRETE DELIVERY TRUCK CHUTES IS RESTRICTED TO APPROVED CONCRETE WASH OUT LOCATIONS ON THE JOB SITE. THE DISCHARGE OF WATER CONTAINING WASTE CONCRETE TO THE STORM SEWER SYSTEM IS PROHIBITED. ALL CONCRETE WASTE SHALL BE PROPERLY CLEANED UP AND DISPOSED AT AN APPROPRIATE LOCATION.
 - ALL DEWATERING ON SITE SHALL BE COORDINATED WITH A SEMWA GESC INSPECTOR AND BE FREE OF SEDIMENT IN ACCORDANCE WITH THE GESC MANUAL, AND STATE OF COLORADO DEWATERING PERMIT.
 - ALL PERMANENT INSTALLATIONS OF PIPES FOR STORM SEWERS, SLOPE DRAINS, AND CULVERTS, TOGETHER WITH RIPRAP APPROX OR OTHER INLET AND OUTLET PROTECTION, REQUIRE INSPECTION BY SEMWA (SEPARATE FROM GESC INSPECTIONS).
 - ALL DISTURBED AREAS SHALL BE STABILIZED IN ACCORDANCE WITH THE GESC MANUAL WITHIN 14 DAYS OF SUBSTANTIAL COMPLETION OF GRADING, INCLUDING AREAS TO REMAIN DORMANT FOR LONGER THAN 30 DAYS, UNLESS OTHERWISE NOTED. THIS MAY REQUIRE MULTIPLE MOBILIZATIONS FOR SEEDING AND MULCHING.
 - HYDRAULIC SEEDING IS NOT AN ACCEPTABLE METHOD OF SEEDING WITHIN THE SEMWA SERVICE AREA.
 - HYDRO-MULCH MAY BE USED FOR LIMITED APPLICATIONS AS APPROVED BY SEMWA.
 - UTILITY LINE INSTALLATION SHALL COMPLY WITH THE FOLLOWING CRITERIA:
 - ALL UTILITY WORK WITHIN A CITY OF CENTENNIAL RIGHT-OF-WAY SHALL BE REQUIRED TO OBTAIN A CITY OF CENTENNIAL RIGHT-OF-WAY USE AND CONSTRUCTION PERMIT IN ACCORDANCE WITH THE APPROPRIATE STANDARDS.
 - PROVIDE ADEQUATE EROSION AND SEDIMENT CONTROLS.
 - AT THE END OF A WORK DAY, FENCE SHALL BE LEFT OPEN AND BACKFILL MUST BE COMPLETED TO GRADE, WHERE CONSISTENT WITH SAFETY AND SPACE CONSIDERATIONS. EXCAVATED MATERIAL IS TO BE PLACED ON THE PHASE SITE OF TRENCHES.
 - AT NO TIME SHALL EXCAVATED MATERIAL BE PLACED ON THE STREET.
 - TRENCH DEWATERING DEVICES MUST BE INSTALLED IN A MANNER THAT WILL NOT EFFECT STREAMS, WETLANDS, DRAINAGE SYSTEMS, OR OFF-SITE PROPERTY. DISCHARGE FROM TRENCH SHALL BE FREE OF ANY SEDIMENT. A RIPRAP PAD SHALL BE INSTALLED AT THE DISCHARGE END OF THE HOSE TO PREVENT ANY ADDITIONAL EROSION. STORM SEWER INLET PROTECTION SHALL BE PROVIDED WHENEVER SOIL EROSION FROM THE EXCAVATED AREA HAS POTENTIAL FOR ENTERING THE STORM SEWER.
 - ALL DISTURBED AREAS SHALL BE DRILL SEEDED AND CRIMP MULCHED WITHIN FIVE DAYS AFTER UTILITY INSTALLATION IS COMPLETED.
 - ALL OTHER APPLICABLE CRITERIA AS OUTLINED IN THE GESC MANUAL.
 - ALL SINGLE-FAMILY RESIDENTIAL DEVELOPMENT PROJECTS SHALL COMPLY WITH THE GESC CRITERIA AS PRESENTED IN THE GESC MANUAL.
 - NO RECYCLED ASPHALT SHALL BE USED AS A CONTROL MEASURE. RECYCLED CONCRETE MUST BE APPROVED BY SEMWA.
 - SEMWA MAY ALLOW THE INSTALLATION OF ALTERNATIVE CONTROL MEASURES OTHER THAN THE GESC PLAN STANDARD NOTES AND DETAILS. IF ALTERNATIVE EROSION AND SEDIMENT CONTROL MEASURES WILL BE USED, CUT SHEETS MUST BE SUBMITTED TO THE SEMWA INSPECTOR FOR REVIEW AND APPROVAL.
 - IF YOU ARE EXPORTING EXCESS DIRT WITHIN THE SEMWA SERVICE AREA YOU WILL BE REQUIRED TO OBTAIN A GESC PERMIT FOR THE SECONDARY SITE.

DETAIL NO.	SHEET NO.	LEGEND
1	1	CBC CUT BACK CURB
2	1	CD CHECK DAM
3	1	CWA CONCRETE WASHOUT AREA
4	1	CF CONSTRUCTION FENCE
5	1	CM CONSTRUCTION MARKERS
6	1	CS CURB SOCK
7	1	DW DEWATERING
8	1	DD DIVERSION DITCH
9	2	ECB EROSION CONTROL BLANKET
10	2	FGM FLEXIBLE GROWTH MEDIUM
11	2	GMS GROUT MIXING STATION
12	2	IP INLET PROTECTION
13	2	RCD REINFORCED CHECK DAM
14	2	RRB REINFORCED ROCK BERM
15	2	RRR RRR FOR CULVERT PROTECTION
16	3	SB SEDIMENT BASIN
17	3	SCL SEDIMENT CONTROL LOG
18	3	ST SEDIMENT TRAP
19	3	SM SEEDING AND MULCHING
20	3	SF SILT FENCE
21	3	SFR SILT FENCE REINFORCED
22	4	SID SLOPE INTERCEPT DITCH
23	4	SSA STABILIZED STAGING AREA
24	4	SR SURFACE ROUGHENING
25	4	TSD TEMPORARY SLOPE DRAIN
26	4	TSC TEMPORARY STREAM CROSSING
27	4	VTC VEHICLE TRACKING CONTROL
28	4	VTC WITH WHEEL WASH
		ROCK AND RIPRAP GRADATIONS LIMITS OF CONSTRUCTION
		MAY MEET MAJOR MODIFICATION REQUIREMENTS

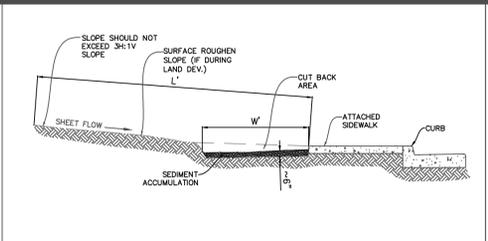


ROCK AND RIPRAP GRADATIONS

TABLE 1. RIPRAP GRADATIONS			
D50 MEDIAN STONE (INCHES)	% OF MATERIAL SMALLER THAN TYPICAL STONE	TYPICAL STONE EQUIVALENT DIAMETER (INCHES)	TYPICAL STONE WEIGHT (POUNDS)
6	70 - 100 50 - 70 35 - 50 2 - 10	12 9 6 2	85 35 10 0.4
9	70 - 100 50 - 70 35 - 50 2 - 10	15 12 9 3	160 125 85 1.3
12	70 - 100 50 - 70 35 - 50 2 - 10	21 18 12 4	440 275 170 3
18	100 50 - 70 35 - 50 2 - 10	30 24 18 6	1280 650 275 10
24	100 50 - 70 35 - 50 2 - 10	42 33 24 9	3500 1700 650 35

TABLE 2. RIPRAP BEDDING		
SIEVE SIZE	MASS PERCENT PASSING SQUARE MESH SIZES	
	CLASS A	
3"	100	
1 1/2"	20 - 90	
NO. 4	0 - 20	
NO. 200	0 - 3	

MATCHES SPECIFICATIONS FOR COPT CLASS A FILTER MATERIAL AND LEED TYPE 1 BEDDING. ALL ROCK SHALL BE FRACTURED FACE, ALL SIDES.



LENGTH (L) OF DISTURBED AREA PERPENDICULAR TO CURB	AREA PER FT. OF DISTURBED LENGTH (FT²)	DEPTH OF CURB CUT (D) (FT)	REQUIRED STORAGE VOLUME (FT³/ACRE)	REQUIRED MIN. WIDTH (W) OF CURB CUT BACK (FT)
20	20	6	0.50 1800	0.0413 1.7
30	30	6	0.50 1800	0.0413 2.5
40	40	6	0.50 1800	0.0413 2.3
50	50	6	0.50 1800	0.0413 4.1
60	60	6	0.50 1800	0.0413 5.0
70	70	6	0.50 1800	0.0413 5.9
80	80	6	0.50 1800	0.0413 6.6
90	90	6	0.50 1800	0.0413 7.4
100	100	6	0.50 1800	0.0413 8.3

1. FROM DOUGLAS COUNTY, GRADING, EROSION, AND SEDIMENT CONTROL MANUAL SEDIMENT TRAP STORAGE VOLUME REQUIREMENT.

DESCRIPTION AND PURPOSE

- A TEMPORARY SEDIMENT BARRIER AND TRAP FORMED BY EXCAVATION BEHIND CURB OR SIDEWALK TO RETAIN SEDIMENT ON SITE DURING CONSTRUCTION.

SUITABLE APPLICATIONS

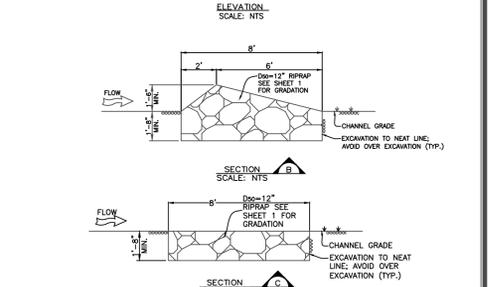
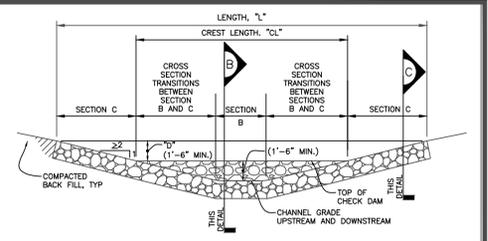
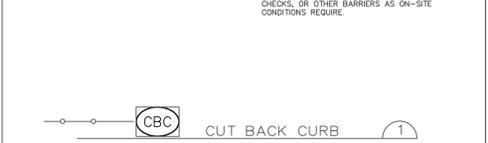
- DURING LAND DEVELOPMENT AFTER PAVING OR DURING VERTICAL CONSTRUCTION.
- USE IN TREE LAWNS OR IN LANDSCAPE ISLAND.
- USE SURFACE ROUGHENING ON UPGRADED SLOPES IF DURING LAND DEVELOPMENT.

LIMITATIONS

- NOT FOR USE EXCEEDING 3:1 VERTICAL SLOPES.
- NOT FOR USE FOR CONCENTRATED FLOW AREAS.
- PROLONGED STANDING WATER MAY AFFECT SUB-BASE OF PAVING AND COULD CAUSE SOIL TO SETTLE AND POTENTIALLY DAMAGE CONCRETE.

INSPECTION AND MAINTENANCE

- THE GESC MANAGER SHALL INSPECT AS NECESSARY TO ENSURE THE ADEQUACY AND FUNCTIONALITY OF THE CONTROL MEASURE.
- REMOVE ACCUMULATED SEDIMENT WITHIN 1/2 CAPACITY. DO NOT ALLOW SEDIMENT TO OVERFLOW CURB OR SIDEWALK.
- IMPLEMENT ADDITIONAL CONTROL MEASURES SUCH AS DOWNGRADIENT SEDIMENT CONTROL, TATTLES, CURB CHECKS, OR OTHER BARRIERS AS ON-SITE CONDITIONS REQUIRE.

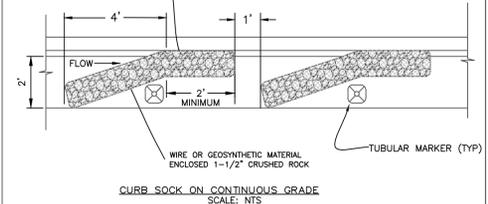
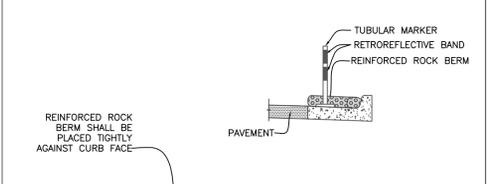


CHECK DAM INSTALLATION NOTES

- SEE PLAN VIEW FOR:
- LOCATIONS OF CHECK DAMS.
- CHECK DAM TYPE (CHECK DAM OR REINFORCED CHECK DAM).
- LENGTH, "L", CREST LENGTH, "CL", AND DEPTH, "D".
- CHECK DAMS INDICATED ON INITIAL GESC PLAN SHALL BE INSTALLED PRIOR TO ANY UPSTREAM LAND-DISTURBING ACTIVITIES.
- CHECK DAMS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVER IS APPROVED BY SEMWA.
- WHEN CHECK DAMS ARE REMOVED, EXCAVATIONS SHALL BE FILLED WITH SUITABLE COMPACTED BACK FILL. ANY DISTURBED AREA SHALL BE SEEDED AND MULCHED AND COVERED WITH EROSION CONTROL BLANKET OR OTHERWISE STABILIZED IN A MANNER APPROVED BY SEMWA.

CHECK DAM MAINTENANCE NOTES

- THE GESC MANAGER SHALL INSPECT AS NECESSARY TO ENSURE THE ADEQUACY AND FUNCTIONALITY OF THE CONTROL MEASURE.
- SEDIMENT ACCUMULATED UPSTREAM OF CHECK DAMS SHALL BE REMOVED WHEN THE SEDIMENT DEPTH UPSTREAM OF CHECK DAM IS WITHIN 1/2 OF THE HEIGHT OF THE CREST.
- CHECK DAMS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVER IS APPROVED BY SEMWA.
- RIAP PAD SHALL BE TRENCHED INTO THE CHANNEL BANKS TO ADEQUATELY ANCHOR WITH CENTER OF THE DAM LOWER TO ALLOW FOR OVERFLOWING AT THE CREST.

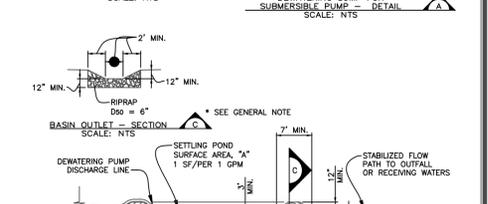
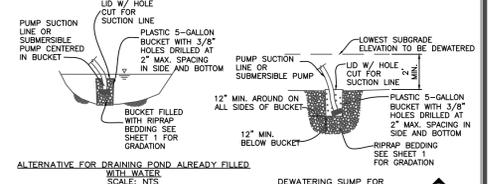


CURB SOCK INSTALLATION NOTES

- ADDITIONAL CURB SOCKS MAY BE REQUIRED AS DIRECTED BY SEMWA.
- CURB SOCKS IN STREETS SHALL BE INSTALLED WITHIN 48-HOURS OF POURING CURBS. CURB SOCKS (AFTER PAVEMENT) SHALL BE INSTALLED WITHIN 48 HOURS AFTER PAVING IS PLACED.
- CRUSHED ROCK SHALL BE FRACTURED FACE ON ALL SIDES.
- WIRE MESH SHALL BE FABRICATED OF WIRE TWISTED INTO A MESH WITH A MAXIMUM OPENING OF 1.0 INCH (COMMONLY TERMED "CHICKEN WIRE"). ROLL WIDTH SHALL BE 48-INCHES.
- WIRE MESH SHALL BE SECURED USING "HOG RINGS" OR WIRE TIES AT APPROXIMATELY 6-INCH CENTERS ALONG ALL JOINTS AND AT APPROXIMATELY 2-INCH CENTERS ON ENDS OF BERM.
- REINFORCED ROCK BERM SHALL BE CONSTRUCTED IN ONE PIECE OR SHALL BE CONSTRUCTED USING JOINT DETAIL.
- EXAMPLES OF ACCEPTABLE GEOSYNTHETIC MATERIAL: TENACE MIRAFI MIRAGRD 2XT; STRATA GLOBAL SOLUTIONS "STRATAGRD SG 150", SOLID FABRIC OPTIONAL.
- THE TOP OF REINFORCED ROCK BERM SHALL BE 1/2"-1" BELOW TOP OF CURB.

CURB SOCK MAINTENANCE NOTES

- THE GESC MANAGER SHALL INSPECT AS NECESSARY TO ENSURE THE ADEQUACY AND FUNCTIONALITY OF THE CONTROL MEASURE.
- SEDIMENT ACCUMULATED UPSTREAM OF CURB SOCK SHALL BE REMOVED WHEN THERE IS EVIDENCE OF SIGNIFICANT SEDIMENT BUILDUP.
- CURB PROTECTION IS TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVER IS APPROVED, UNLESS SEMWA APPROVES EARLIER REMOVAL OF CURB PROTECTION IN STREETS.



DEWATERING INSTALLATION NOTES

- A CONSTRUCTION DISCHARGE (DEWATERING) PERMIT, IF REQUIRED, SHALL BE OBTAINED FROM THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT PRIOR TO ANY DEWATERING OPERATIONS. ALL DEWATERING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE DISCHARGE PERMIT AND SHALL BE COORDINATED WITH THE SEMWA GESC INSPECTOR.
- THE GESC MANAGER SHALL PROVIDE, OPERATE, AND MAINTAIN DEWATERING SYSTEMS OF SUFFICIENT SIZE AND CAPACITY.
- DEWATERING OPERATIONS SHALL USE ONE OR MORE OF THE DEWATERING SUMPS SHOWN ABOVE OR OTHER MEANS APPROVED BY SEMWA TO REDUCE THE PUMPING OF SEDIMENT, AND SHALL PROVIDE A TEMPORARY BASIN FOR SETTLING PUMPED DISCHARGES PRIOR TO RELEASE OFF SITE OR TO A RECEIVING WATER.
- SEDIMENT BASIN PER DETAIL 14 MAY BE USED IN LIEU OF SUMP DISCHARGE SETTLING BASIN SHOWN ABOVE.
- THE DISCHARGE END OF THE LINE SHALL BE STAKED IN PLACES TO PREVENT MOVEMENT OF THE LINE OFF THE STABILIZED DISCHARGE POINT.

DEWATERING MAINTENANCE NOTES

- THE GESC MANAGER SHALL INSPECT AS NECESSARY TO ENSURE THE ADEQUACY AND FUNCTIONALITY OF THE CONTROL MEASURE.
- TEMPORARY SETTLING BASINS SHALL BE REMOVED WHEN NO LONGER NEEDED FOR DEWATERING OPERATIONS. ANY DISTURBED AREA SHALL BE DRILL SEEDED AND CRIMP MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY SEMWA.

GENERAL NOTE:

USE OF A SEDIMENT FILTER BAG MAY BE SUBSTITUTED FOR USE OF THE RIPRAP PAD AND SUMP DISCHARGE SETTLING BASIN. FILTER BAG TO SET ON RELATIVELY FLAT SURFACE GROUND.

Arapahoe County

06/17/2021

VALID ONLY IF FIRST PAGE IS SIGNED

UTILITY NOTIFICATION CENTER OF COLORADO

CALL BEFORE YOU DIG

811

Call 2 days prior to any digging, grading or excavating for the marking of underground member utilities

SOUTHEAST METRO STORMWATER AUTHORITY

7437 SOUTH FAIRPLAY STREET
CENTENNIAL COLORADO
80112-4486
(303) 858-8844 - INSPECTION DIVISION

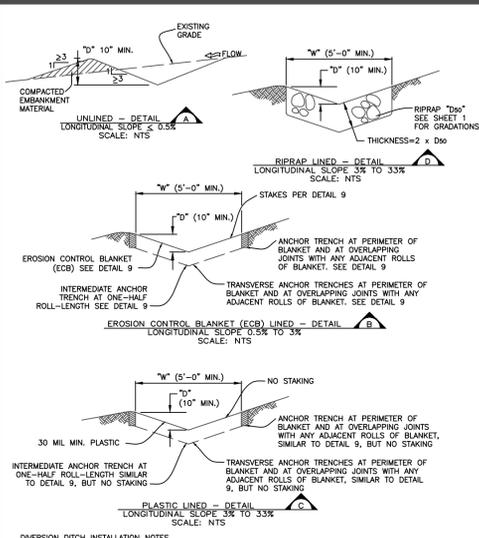
Southeast Metro Stormwater Authority

ARAPAHOE COUNTY
COLORADO'S FIRST

GRADING EROSION AND SEDIMENT CONTROL STANDARD NOTES AND DETAILS

REVISED APRIL 2019

GESC SHEET 1 OF 4

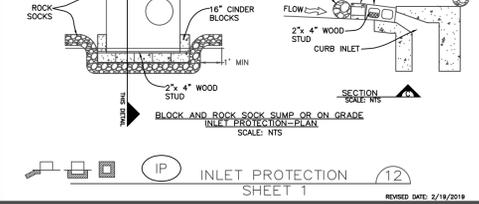
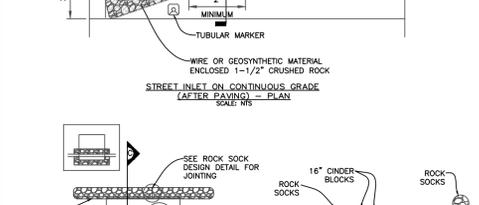
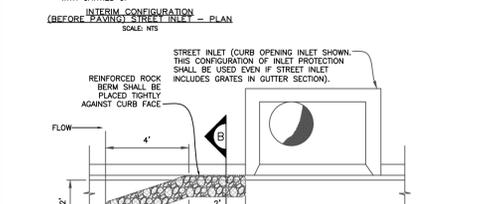
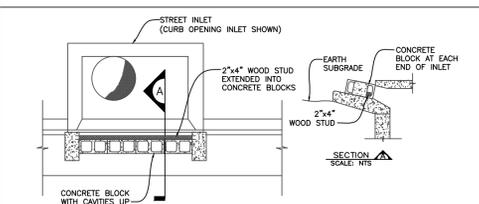


EROSION CONTROL BLANKET INSTALLATION NOTES

- SEE PLAN VIEW FOR:
 - TYPE OF DITCH (UNLINED, ECB LINED, PLASTIC LINED OR RIPRAP LINED).
 - DEPTH, "D", AND WIDTH, "W" DIMENSIONS.
 - FOR RIPRAP LINED DITCH, SIZE OF RIPRAP, "D₅₀".
 - FOR ECB LINED DITCH, EROSION CONTROL BLANKET TYPE (SEE DETAIL 9).
 - FOR PLASTIC LINED DITCH, SIZE OF RIPRAP, "D₅₀".
- SEE DRAINAGE PLANS FOR DETAILS OF ANY PERMANENT CONVEYANCE FACILITIES OR DIVERSION DITCHES EXCEEDING A 2-YEAR FLOW RATE OF 10 CFS.
- DIVERSION DITCHES INDICATED ON INITIAL GESC PLAN SHALL BE INSTALLED PRIOR TO ANY LAND-DISTURBING ACTIVITIES.
- FOR ECB LINED DITCHES, INSTALLATION OF EROSION CONTROL BLANKET SHALL CONFORM TO THE REQUIREMENTS OF DETAIL 9.
- IN LOCATIONS WHERE CONSTRUCTION TRAFFIC MUST CROSS A DIVERSION DITCH, THE PERMITTEES SHALL INSTALL A TEMPORARY CULVERT.

DIVERSION DITCH MAINTENANCE NOTES

- THE GESC MANAGER SHALL INSPECT AS NECESSARY TO ENSURE THE ADEQUACY AND FUNCTIONALITY OF THE CONTROL MEASURE.
- DIVERSION DITCHES ARE TO REMAIN IN PLACE UNTIL THE END OF CONSTRUCTION, OR, IF APPROVED BY SEMSWA, LEFT IN PLACE.
- IF DIVERSION DITCHES ARE REMOVED, THE DISTURBED AREA SHALL BE DRILL SEEDED AND CRIMP MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY SEMSWA.

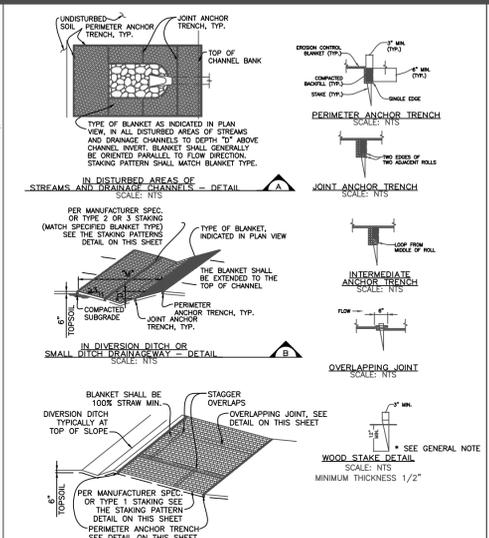


DIVERSION DITCH INSTALLATION NOTES

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DIVERSION DITCH MAINTENANCE NOTES

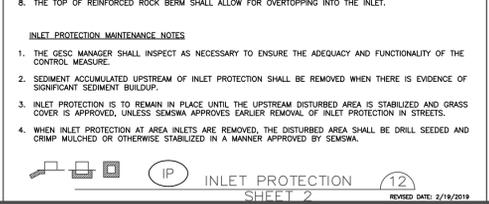
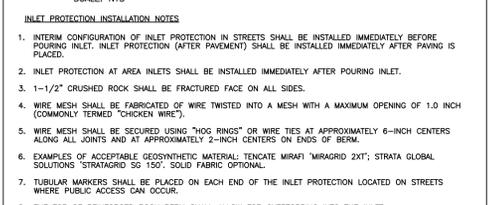
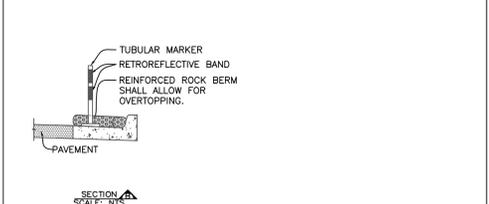
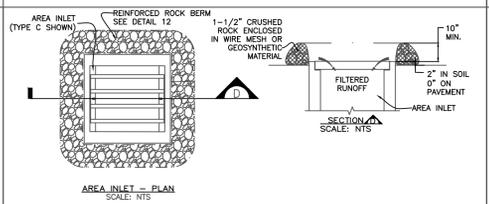
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- DIVERSION DITCHES ARE TO REMAIN IN PLACE UNTIL THE END OF CONSTRUCTION, OR, IF APPROVED BY SEMSWA, LEFT IN PLACE.
- IF DIVERSION DITCHES ARE REMOVED, THE DISTURBED AREA SHALL BE DRILL SEEDED AND CRIMP MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY SEMSWA.



EROSION CONTROL BLANKET MAINTENANCE NOTES

- THE GESC MANAGER SHALL INSPECT AS NECESSARY TO ENSURE THE ADEQUACY AND FUNCTIONALITY OF THE CONTROL MEASURE.
- EROSION CONTROL BLANKET IS TO BE LEFT IN PLACE UNLESS REQUESTED TO BE REMOVED BY SEMSWA.
- ANY EROSION CONTROL BLANKET PULLED OUT, TORN, OR OTHERWISE DAMAGED SHALL BE RE-INSTALLED. ANY SUBGRADE AREAS BELOW THE BLANKET THAT HAVE ERODED TO CREATE A VOID UNDER THE BLANKET, OR THAT REMAIN EXPOSED OF GRASS SHALL BE REPAIRED, RESEEDED AND MULCHED AND THE EROSION CONTROL BLANKET RE-INSTALLED.
- REMOVAL OF 2X4 WEDGE STAKES MAY BE REQUIRED PRIOR TO FINAL CLOSE OUT OF THE PERMIT.

GENERAL NOTE:
ECO-STAKES MAY BE USED IN AREAS ABOVE ORDINARY HIGH WATER MARK.

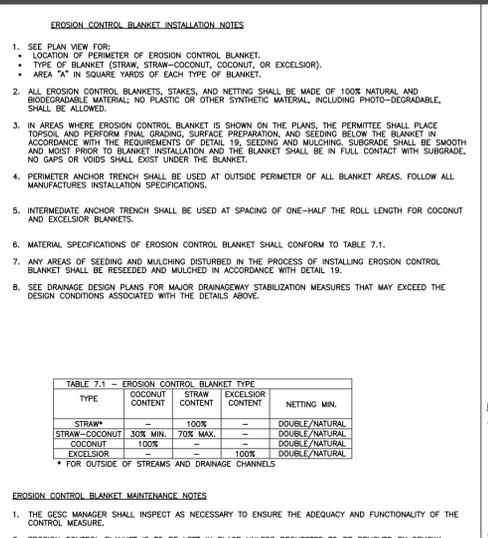


AREA INLET INSTALLATION NOTES

- INTERIM CONFIGURATION OF INLET PROTECTION IN STREETS SHALL BE INSTALLED IMMEDIATELY BEFORE POURING INLET. INLET PROTECTION (AFTER PAVEMENT) SHALL BE INSTALLED IMMEDIATELY AFTER PAVING IS PLACED.
- INLET PROTECTION AT AREA INLETS SHALL BE INSTALLED IMMEDIATELY AFTER POURING INLET.
- 1-1/2" CRUSHED ROCK SHALL BE FRACTURED FACE ON ALL SIDES.
- WIRE MESH SHALL BE FABRICATED OF WIRE TWISTED INTO A MESH WITH A MAXIMUM OPENING OF 1.0 INCH (COMMONLY TERMED "CHICKEN WIRE").
- WIRE MESH SHALL BE SECURED USING "HOG RINGS" OR WIRE TIES AT APPROXIMATELY 6-INCH CENTERS ALONG ALL JOINTS AND AT APPROXIMATELY 2-INCH CENTERS ON ENDS OF BERM.
- EXAMPLES OF ACCEPTABLE GEOSYNTHETIC MATERIAL: TENCATE MIRAFI (MIRAGRID 2XT); STRATA GLOBAL SOLUTIONS "STRATAGRID SG 150"; SOLID FABRIC OPTIONAL.
- TUBULAR MARKERS SHALL BE PLACED ON EACH END OF THE INLET PROTECTION LOCATED ON STREETS WHERE PUBLIC ACCESS CAN OCCUR.
- THE TOP OF REINFORCED ROCK BERM SHALL ALLOW FOR OVERTOPPING INTO THE INLET.

INLET PROTECTION MAINTENANCE NOTES

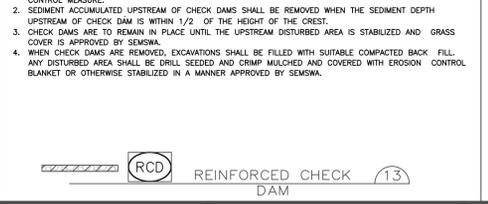
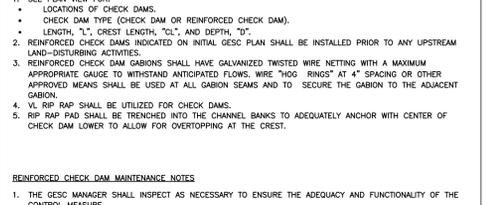
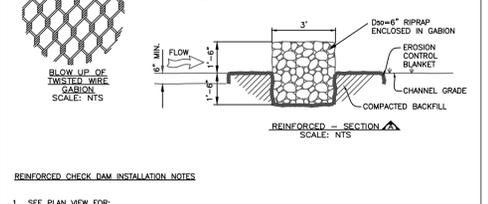
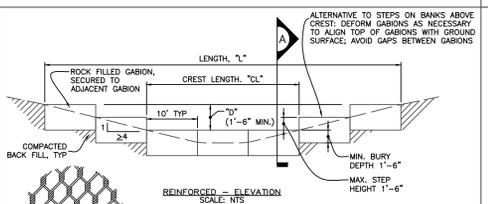
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- SEDIMENT ACCUMULATED UPSTREAM OF INLET PROTECTION SHALL BE REMOVED WHEN THERE IS EVIDENCE OF SIGNIFICANT SEDIMENT BUILDUP.
- INLET PROTECTION IS TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVER IS APPROVED BY SEMSWA. EXCAVATIONS SHALL BE FILLED WITH SUITABLE COMPACTED BACK FILL.
- WHEN INLET PROTECTION AT AREA INLETS ARE REMOVED, THE DISTURBED AREA SHALL BE DRILL SEEDED AND CRIMP MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY SEMSWA.



EROSION CONTROL BLANKET TYPE

TYPE	COCONUT CONTENT	STRAW CONTENT	EXCELSIOR CONTENT	NETTING MIN.
STRAW*	100%	100%	0%	DOUBLE/NATURAL
STRAW-COCONUT	50% MIN.	50% MIN.	0%	DOUBLE/NATURAL
COCONUT	100%	0%	0%	DOUBLE/NATURAL
EXCELSIOR	0%	0%	100%	DOUBLE/NATURAL

* FOR OUTSIDE OF STREAMS AND DRAINAGE CHANNELS



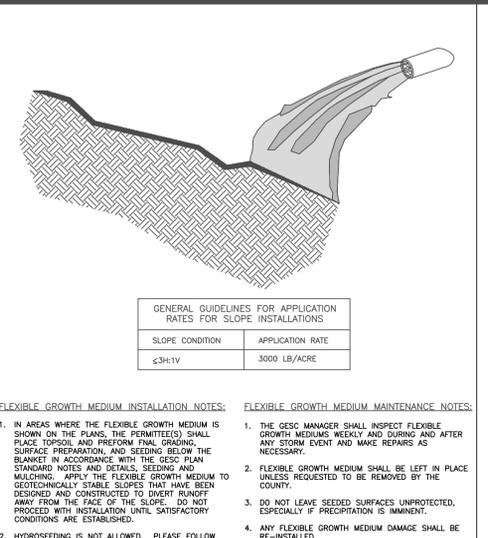
EROSION CONTROL BLANKET INSTALLATION NOTES

- SEE PLAN VIEW FOR:
 - LOCATION OF PERIMETER OF EROSION CONTROL BLANKET.
 - TYPE OF BLANKET (STRAW, STRAW-COCONUT, COCONUT OR EXCELSIOR).
 - AREA "A" IN SQUARE YARDS OF EACH TYPE OF BLANKET.
- ALL EROSION CONTROL BLANKETS, STAKES, AND NETTING SHALL BE MADE OF 100% NATURAL AND BIODEGRADABLE MATERIAL. NO PLASTIC OR OTHER SYNTHETIC MATERIAL, INCLUDING PHOTO-DEGRADABLE, SHALL BE ALLOWED.
- IN AREAS WHERE EROSION CONTROL BLANKET IS SHOWN ON THE PLANS, THE PERMITTEE SHALL PLACE TOPSOIL AND PERFORM FINAL GRADING, SURFACE PREPARATION, AND SEEDING BELOW THE BLANKET IN ACCORDANCE WITH THE REQUIREMENTS OF DETAIL 19. SEEDING AND MULCHING, SUBGRADE SHALL BE SMOOTH AND MOST PRIOR TO BLANKET INSTALLATION AND THE BLANKET SHALL BE IN FULL CONTACT WITH SUBGRADE. NO GAPS OR VOIDS SHALL EXIST UNDER THE BLANKET.
- PERIMETER ANCHOR TRENCH SHALL BE USED AT OUTSIDE PERIMETER OF ALL BLANKET AREAS. FOLLOW ALL MANUFACTURER'S INSTALLATION SPECIFICATIONS.
- INTERMEDIATE ANCHOR TRENCH SHALL BE USED AT SPACING OF ONE-HALF THE ROLL LENGTH FOR COCONUT AND EXCELSIOR BLANKETS.
- MATERIAL SPECIFICATIONS OF EROSION CONTROL BLANKET SHALL CONFORM TO TABLE 7.1.
- ANY AREAS OF SEEDING AND MULCHING DISTURBED IN THE PROCESS OF INSTALLING EROSION CONTROL BLANKET SHALL BE RESEEDED AND MULCHED IN ACCORDANCE WITH DETAIL 19.
- SEE DRAINAGE DESIGN PLANS FOR MAJOR DRAINAGEWAY STABILIZATION MEASURES THAT MAY EXCEED THE DESIGN CONDITIONS ASSOCIATED WITH THE DETAILS ABOVE.

EROSION CONTROL BLANKET MAINTENANCE NOTES

- THE GESC MANAGER SHALL INSPECT AS NECESSARY TO ENSURE THE ADEQUACY AND FUNCTIONALITY OF THE CONTROL MEASURE.
- EROSION CONTROL BLANKET IS TO BE LEFT IN PLACE UNLESS REQUESTED TO BE REMOVED BY SEMSWA.
- ANY EROSION CONTROL BLANKET PULLED OUT, TORN, OR OTHERWISE DAMAGED SHALL BE RE-INSTALLED. ANY SUBGRADE AREAS BELOW THE BLANKET THAT HAVE ERODED TO CREATE A VOID UNDER THE BLANKET, OR THAT REMAIN EXPOSED OF GRASS SHALL BE REPAIRED, RESEEDED AND MULCHED AND THE EROSION CONTROL BLANKET RE-INSTALLED.
- REMOVAL OF 2X4 WEDGE STAKES MAY BE REQUIRED PRIOR TO FINAL CLOSE OUT OF THE PERMIT.

GENERAL NOTE:
ECO-STAKES MAY BE USED IN AREAS ABOVE ORDINARY HIGH WATER MARK.



GENERAL GUIDELINES FOR APPLICATION RATES FOR SLOPE INSTALLATIONS

SLOPE CONDITION	APPLICATION RATE
≤3H:1V	3000 LB/ACRE

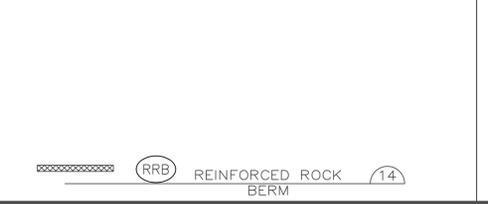
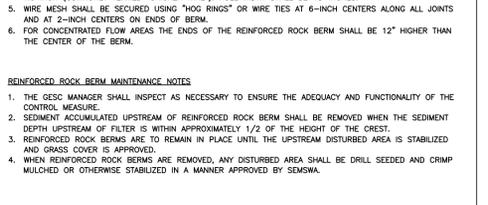
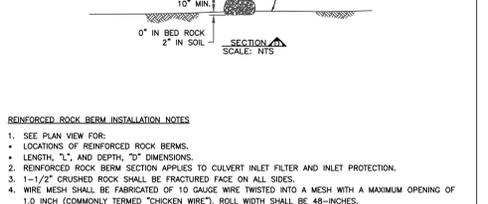
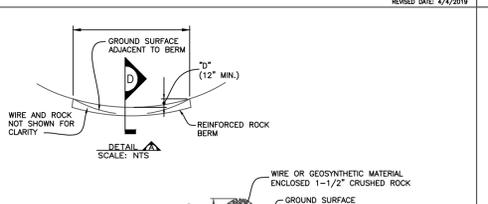
FLEXIBLE GROWTH MEDIUM INSTALLATION NOTES:

- IN AREAS WHERE THE FLEXIBLE GROWTH MEDIUM IS SHOWN ON THE PLANS, THE PERMITTEE(S) SHALL PLACE TOPSOIL AND PERFORM FINAL GRADING, SURFACE PREPARATION, AND SEEDING BELOW THE BLANKET IN ACCORDANCE WITH THE GESC PLAN STANDARD NOTES AND DETAILS. SEEDING AND MULCHING: APPLY THE FLEXIBLE GROWTH MEDIUM TO GEOTECHNICALLY STABLE SLOPES THAT HAVE BEEN DESIGNED AND CONSTRUCTED TO INVERT RUNOFF AWAY FROM THE FACE OF THE SLOPE. DO NOT PROCEED WITH INSTALLATION UNTIL SATISFACTORY CONDITIONS ARE ESTABLISHED.
- HYDROSEEDING IS NOT ALLOWED. PLEASE FOLLOW SEED AND MULCH DETAIL (DETAIL 19).
- MIX AND APPLY PER MANUFACTURER'S DETAILS. FRESHLY SEEDER SURFACES AND DO NOT LEAVE SEEDER SURFACES UNPROTECTED; CONFIRM LOADING RATES WITH EQUIPMENT MANUFACTURER.
- APPLY FGM FROM OPPOSING DIRECTIONS TO ASSURE 100% SOIL SURFACE COVERAGE. SLOPE DEVICES OR WATER DIVERSION TECHNIQUES ARE RECOMMENDED WHEN SLOPE LENGTHS EXCEED 75 FT.
- ANY AREAS OF SEEDING AND MULCHING DISTURBED IN THE PROCESS OF INSTALLING FGM SHALL BE RESEEDED AND MULCHED IN ACCORDANCE WITH DETAIL 19.

FLEXIBLE GROWTH MEDIUM MAINTENANCE NOTES:

- THE GESC MANAGER SHALL INSPECT FLEXIBLE GROWTH MEDIUM WEEKLY AND DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS AS NECESSARY.
- FLEXIBLE GROWTH MEDIUM SHALL BE LEFT IN PLACE UNLESS REQUESTED TO BE REMOVED BY THE COUNTY.
- DO NOT LEAVE SEEDER SURFACES UNPROTECTED, ESPECIALLY IF PRECIPITATION IS IMMINENT.
- ANY FLEXIBLE GROWTH MEDIUM DAMAGE SHALL BE RE-INSTALLED.

NOTE:
THE FLEXIBLE GROWTH MEDIUM SHOULD NOT BE APPLIED IN CHANNELS, SWALES OR OTHER AREAS WHERE CONCENTRATED FLOWS ARE ANTICIPATED, UNLESS INSTALLED IN CONJUNCTION WITH A TEMPORARY EROSION CONTROL BLANKET.



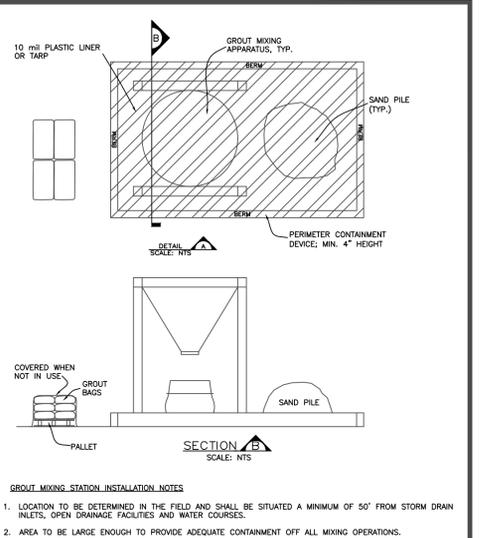
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- HYDROSEEDING IS NOT ALLOWED. PLEASE FOLLOW SEED AND MULCH DETAIL (DETAIL 19).
- MIX AND APPLY PER MANUFACTURER'S DETAILS. FRESHLY SEEDER SURFACES AND DO NOT LEAVE SEEDER SURFACES UNPROTECTED; CONFIRM LOADING RATES WITH EQUIPMENT MANUFACTURER.
- APPLY FGM FROM OPPOSING DIRECTIONS TO ASSURE 100% SOIL SURFACE COVERAGE. SLOPE DEVICES OR WATER DIVERSION TECHNIQUES ARE RECOMMENDED WHEN SLOPE LENGTHS EXCEED 75 FT.
- ANY AREAS OF SEEDING AND MULCHING DISTURBED IN THE PROCESS OF INSTALLING FGM SHALL BE RESEEDED AND MULCHED IN ACCORDANCE WITH DETAIL 19.

FLEXIBLE GROWTH MEDIUM MAINTENANCE NOTES:

- THE GESC MANAGER SHALL INSPECT FLEXIBLE GROWTH MEDIUM WEEKLY AND DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS AS NECESSARY.
- FLEXIBLE GROWTH MEDIUM SHALL BE LEFT IN PLACE UNLESS REQUESTED TO BE REMOVED BY THE COUNTY.
- DO NOT LEAVE SEEDER SURFACES UNPROTECTED, ESPECIALLY IF PRECIPITATION IS IMMINENT.
- ANY FLEXIBLE GROWTH MEDIUM DAMAGE SHALL BE RE-INSTALLED.

NOTE:
THE FLEXIBLE GROWTH MEDIUM SHOULD NOT BE APPLIED IN CHANNELS, SWALES OR OTHER AREAS WHERE CONCENTRATED FLOWS ARE ANTICIPATED, UNLESS INSTALLED IN CONJUNCTION WITH A TEMPORARY EROSION CONTROL BLANKET.

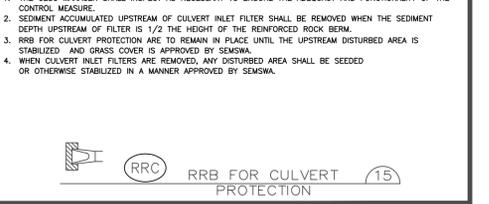
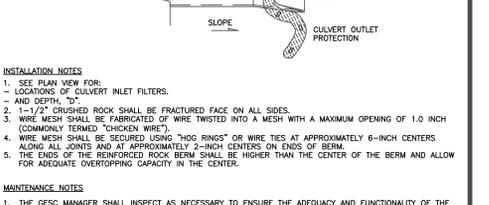
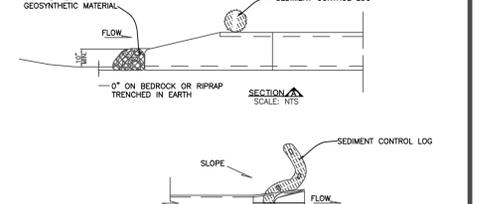
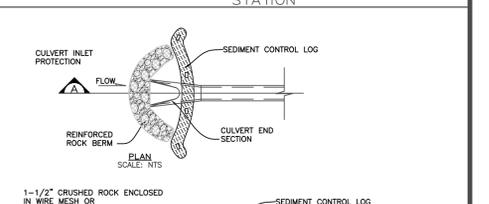


GROUT MIXING STATION INSTALLATION NOTES

- LOCATION TO BE DETERMINED IN THE FIELD AND SHALL BE SITUATED A MINIMUM OF 50' FROM STORM DRAIN INLETS, OPEN DRAINAGE FACILITIES AND WATER COURSES.
- AREA TO BE LARGE ENOUGH TO PROVIDE ADEQUATE CONTAINMENT OFF ALL MIXING OPERATIONS.
- MIXING AREA TO HAVE PERIMETER CONTAINMENT, A MINIMUM OF 4" IN HEIGHT. CONTAINMENT DEVICE CAN BE CONSTRUCTED OF AN EARTHEN BERM, CONCRETE BLOCKS, WOOD FRAME SECURELY FASTENED AROUND PERIMETER AREA OR OTHER APPROVED METHOD. MUST BE SIZED TO ADEQUATELY CONTAIN MIXING OPERATION.
- EXCAVATED MATERIAL MAY BE USED IN PERIMETER BERM CONSTRUCTION.
- MINIMUM 10 MIL PLASTIC LINER OR TARP SHALL COVER THE ENTIRE MIXING AREA SECURELY FASTENED TO THE RAISED CONTAINMENT DEVICE.

GROUT MIXING STATION MAINTENANCE NOTES

- THE GESC MANAGER SHALL INSPECT AS NECESSARY TO ENSURE THE ADEQUACY AND FUNCTIONALITY OF THE CONTROL MEASURE.
- ALL GROUT/ MORTAR SHOULD BE STORED IN AN APPROVED CONCRETE WASHOUT AREA (CWA).
- ALL MATERIALS SHALL BE SHEDD AND COVERED ON PALLETS ADJACENT TO THE MIXING AREA.
- LINER AND ALL GROUT/ MORTAR WASTE RESIDUE SHALL BE PROPERLY DISPOSED OF AT THE END OF THE MIXING OPERATION.



GROUT MIXING STATION INSTALLATION NOTES

- LOCATION TO BE DETERMINED IN THE FIELD AND SHALL BE SITUATED A MINIMUM OF 50' FROM STORM DRAIN INLETS, OPEN DRAINAGE FACILITIES AND WATER COURSES.
- AREA TO BE LARGE ENOUGH TO PROVIDE ADEQUATE CONTAINMENT OFF ALL MIXING OPERATIONS.
- MIXING AREA TO HAVE PERIMETER CONTAINMENT, A MINIMUM OF 4" IN HEIGHT. CONTAINMENT DEVICE CAN BE CONSTRUCTED OF AN EARTHEN BERM, CONCRETE BLOCKS, WOOD FRAME SECURELY FASTENED AROUND PERIMETER AREA OR OTHER APPROVED METHOD. MUST BE SIZED TO ADEQUATELY CONTAIN MIXING OPERATION.
- EXCAVATED MATERIAL MAY BE USED IN PERIMETER BERM CONSTRUCTION.
- MINIMUM 10 MIL PLASTIC LINER OR TARP SHALL COVER THE ENTIRE MIXING AREA SECURELY FASTENED TO THE RAISED CONTAINMENT DEVICE.

GROUT MIXING STATION MAINTENANCE NOTES

- THE GESC MANAGER SHALL INSPECT AS NECESSARY TO ENSURE THE ADEQUACY AND FUNCTIONALITY OF THE CONTROL MEASURE.
- ALL GROUT/ MORTAR SHOULD BE STORED IN AN APPROVED CONCRETE WASHOUT AREA (CWA).
- ALL MATERIALS SHALL BE SHEDD AND COVERED ON PALLETS ADJACENT TO THE MIXING AREA.
- LINER AND ALL GROUT/ MORTAR WASTE RESIDUE SHALL BE PROPERLY DISPOSED OF AT THE END OF THE MIXING OPERATION.

Arapahoe County
06/17/2021
VALID ONLY IF FIRST PAGE IS SIGNED

UTILITY NOTIFICATION CENTER OF COLORADO
CALL BEFORE YOU DIG
811
Call 2 days prior to any digging, grading or excavating for the marking of underground member utilities

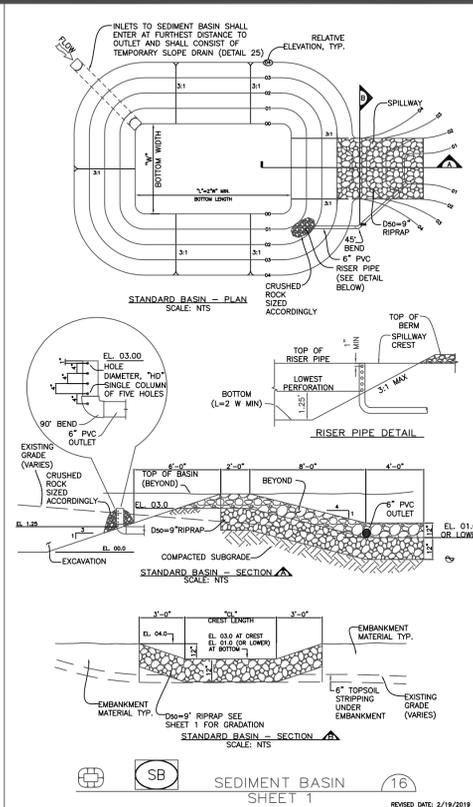
SOUTHEAST METRO STORMWATER AUTHORITY
7437 SOUTH FAIRPLAY STREET
CENTENNIAL COLORADO
80112-4486
(303) 858-8844 - INSPECTION DIVISION

Southeast Metro Stormwater Authority

ARAPAHOE COUNTY
COLORADO'S FIRST

GRADING EROSION AND SEDIMENT CONTROL STANDARD NOTES AND DETAILS
REVISED APRIL 2019

GESC SHEET 2 OF 4



- SEDIMENT BASIN INSTALLATION NOTES**
- SEE PLAN VIEW FOR:
 - LOCATION OF SEDIMENT BASIN.
 - TYPE OF BASIN (STANDARD BASIN OR NON-STANDARD BASIN).
 - FOR STANDARD BASIN, CREST LENGTH, "CL", BOTTOM WIDTH, "W", AND HOLE DIAMETER, "HD".
 - FOR NON-STANDARD BASIN, SEE CONSTRUCTION DRAWINGS FOR DESIGN OF BASIN INCLUDING RISER HEIGHT, "R", NUMBER OF COLLARS, "N", HOLE DIAMETER, "HD", AND PIPE DIAMETER "D".
 - FOR STANDARD BASIN, BOTTOM DIMENSION MAY BE MODIFIED AS LONG AS BOTTOM AREA IS NOT REDUCED.
 - SEDIMENT BASINS INDICATED ON INITIAL GESC PLAN SHALL BE INSTALLED PRIOR TO ANY OTHER LAND-DISTURBING ACTIVITY.
 - EMBANKMENT MATERIAL SHALL CONSIST OF SOIL FREE OF DEBRIS, ORGANIC MATERIAL, AND ROCKS GREATER THAN 3 INCHES AND SHALL HAVE A MINIMUM OF 15 PERCENT BY WEIGHT PASSING THE NO. 200 SIEVE.
 - EMBANKMENT MATERIAL SHALL BE COMPACTED TO AT LEAST 95 PERCENT OF MAXIMUM DENSITY WITHIN 2 PERCENTAGE POINTS OF OPTIMUM DENSITY IN ACCORDANCE WITH ASTM D688.
 - PIPE SCH 40 OR GREATER SHALL BE USED.
 - THE DETAILS SHOWN ON THIS SHEET PERTAIN TO STANDARD SEDIMENT BASIN(S) IDENTIFIED ON THE GESC PLAN VIEW DRAWINGS USED FOR DRAINAGE AREAS LESS THAN 15 ACRES. SEE CONSTRUCTION DRAWINGS FOR EMBANKMENT, STORAGE VOLUME, SPILLWAY, OUTLET, AND OUTLET PROTECTION DETAILS FOR ANY SEDIMENT BASIN(S) THAT HAVE BEEN INDIVIDUALLY DESIGNED FOR DRAINAGE AREAS LARGER THAN 15 ACRES.

- SEDIMENT BASIN MAINTENANCE NOTES**
- THE GESC MANAGER SHALL INSPECT AS NECESSARY TO ENSURE THE ADEQUACY AND FUNCTIONALITY OF THE CONTROL MEASURE.
 - SEDIMENT SHALL BE REMOVED FROM THE POND WHEN DESIGNED STORAGE VOLUME IS NO MORE THAN ONE-THIRD FILLED WITH SEDIMENT.
 - SEDIMENT BASINS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVER IS APPROVED BY SEMSWA.
 - IF SEDIMENT BASINS ARE REMOVED, THE DISTURBED AREA SHALL BE SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY SEMSWA.
 - TRASH AND DEBRIS SHALL BE REMOVED FROM THE SEDIMENT BASIN TO PREVENT CLOGGING AT THE OUTLET.

PERMANENT DRILL SEEDING¹ - WETLAND SEED MIX²

SPECIES	SCIENTIFIC NAME	SEASON	% IN MIX	SEEDS/LB.	PLS ³ /AC
SLOUGH GRASS	BECKMANNIA SYZIGACHNE	COOL	20	1,150,000	0.5
CANADIAN REED GRASS	CALAMAGROSTIS CANADENSIS	COOL	20	2,270,000	0.2
TUFTED HAIR GRASS	DESCHAMPSIA CESPIITOSA	COOL	10	2,500,000	0.1
COMMON SPIKE RUSH	ELEOCHARIS PALUSTRIS	COOL	15	620,000	0.6
BALTIC RUSH	JUNCUS BALTICUS	COOL	15	10,900,000	0.4
KNOTTED RUSH	JUNCUS NODOSUS	COOL	10	12,300,000	0.1
TORREY'S RUSH	JUNCUS TORREYI	COOL	10	12,300,000	0.1
TOTAL			100		2 LBS PLS ³ /AC

PERMANENT DRILL SEEDING¹ - TRANSITION SEED MIX - WITHOUT FORBS

SPECIES	SCIENTIFIC NAME	SEASON	% IN MIX	SEEDS/LB.	PLS ³ /AC
CANADA WILDRYE	ELYMUS CANADENSIS	COOL	15	115,000	3.4
STREAMBANK WHEATGRASS	ELYMUS LANCOLATUS SPP. PSAMMOPHILUS	COOL	15	156,000	2.5
SLENDER WHEAT GRASS	ELYMUS TRACHYCAULUS	WARM	10	159,000	1.6
BALTIC RUSH	JUNCUS BALTICUS	COOL	15	10,900,000	0.1
SWITCHGRASS	PANICUM VIRGATUM	WARM	15	389,000	1.0
WESTERN WHEATGRASS	PASPOPYRUM SMITHI	COOL	15	110,000	3.6
SAND DROPSPEED	SPOROBOOLUS AIROIDES	WARM	15	1,758,000	0.2
TOTAL			100		12.4 LBS PLS ³ /AC

PERMANENT DRILL SEEDING¹ - TRANSITION SEED MIX - WITH FORBS

SPECIES	SCIENTIFIC NAME	SEASON	% IN MIX	SEEDS/LB.	PLS ³ /AC
NATIVE GRASSES					
CANADA WILDRYE	ELYMUS CANADENSIS	COOL	15	115,000	3.4
STREAMBANK WHEATGRASS	ELYMUS LANCOLATUS SPP. PSAMMOPHILUS	COOL	15	156,000	2.5
SLENDER WHEAT GRASS	ELYMUS TRACHYCAULUS	WARM	10	159,000	1.6
BALTIC RUSH	JUNCUS BALTICUS	COOL	15	10,900,000	0.1
SWITCHGRASS	PANICUM VIRGATUM	WARM	15	389,000	1.0
WESTERN WHEATGRASS	PASPOPYRUM SMITHI	COOL	15	110,000	3.6
SAND DROPSPEED	SPOROBOOLUS AIROIDES	WARM	15	1,758,000	0.2
TOTAL			100		15.5 LBS PLS ³ /AC

PERMANENT DRILL SEEDING¹ - TRANSITION SEED MIX - WITH FORBS

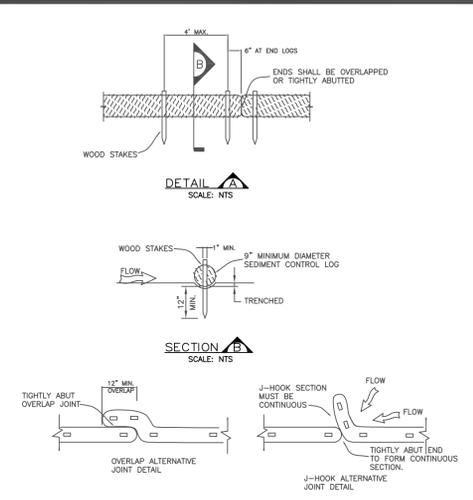
SPECIES	SCIENTIFIC NAME	SEASON	% IN MIX	SEEDS/LB.	PLS ³ /AC
NATIVE WILDFLOWERS					
INDIAN BLANKET FLOWER	GALLARDA ARISTATA	SUMMER-FALL	1	132,000	0.2
ROCKY MOUNTAIN IRIS	IRIS MISSOURIENSIS	SPRING-SUMMER	2	368,000	0.1
EVENING PRIMROSE	OENOTHERA ELATA	SUMMER	2	1,300,000	0.1
GOLDEN BANNER	THERMOPSIS MONTANA	SPRING	2	15,000	3.5
MEXICAN HAT	RATIBIDA COLUMNIFERA	SUMMER-FALL	1	1,230,000	0.1
SAND DROPSPEED	SPOROBOOLUS AIROIDES	WARM	15	1,758,000	0.2
TOTAL			100		14.4 LBS PLS ³ /AC

PERMANENT DRILL SEEDING¹ - UPLAND SEED² MIX - WITHOUT FORBS

SPECIES	SCIENTIFIC NAME	SEASON	% IN MIX	SEEDS/LB.	PLS ³ /AC
BIG BLUESTEM	ANDROPOGON GERARDII	WARM	10	130,000	2.0
SIDEGETS GRAMA	BOUTELOUA CURTIPENDULA	WARM	10	191,000	1.4
BLUE GRAMA	BOUTELOUA GRACILIS	WARM	10	825,000	0.3
CANADA WILDRYE	ELYMUS CANADENSIS	COOL	10	115,000	2.3
THICKSPIKE WHEATGRASS	ELYMUS LANCOLATUS SPP. LANCOLATUS	COOL	5	154,000	0.8
STREAMBANK WHEATGRASS	ELYMUS LANCOLATUS SPP. PSAMMOPHILUS	COOL	5	156,000	0.8
SLENDER WHEAT GRASS	ELYMUS TRACHYCAULUS	WARM	10	159,000	1.6
NEEDLE AND THREAD	HESPEROSTRIPA COMATA	COOL	10	115,000	2.3
WESTERN WHEATGRASS	PASPOPYRUM SMITHI	COOL	10	110,000	2.4
INDIAN GRASS	SORGHASTRUM NITANS	WARM	10	170,000	1.5
SAND DROPSPEED	SPOROBOOLUS CRYPTANDRUS	WARM	10	5,288,000	0.1
TOTAL			100		15.5 LBS PLS ³ /AC

PERMANENT DRILL SEEDING¹ - UPLAND SEED² MIX - WITH FORBS

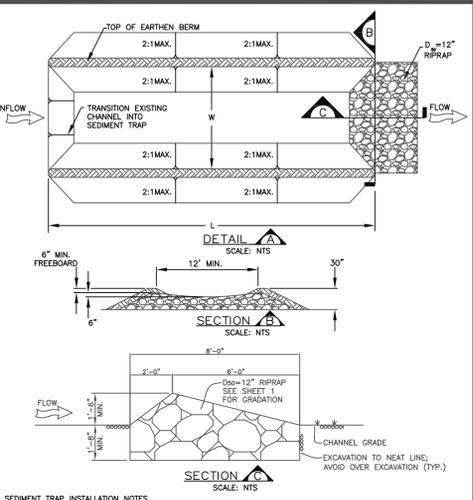
SPECIES	SCIENTIFIC NAME	SEASON	% IN MIX	SEEDS/LB.	PLS ³ /AC
NATIVE WILDFLOWERS					
BLACK-EYED SUSAN	RUBROCKIA HRTA	SUMMER-FALL	1	1,710,000	0.1
SULFUR FLOWER	ERODIUM LAMPELLATUM	FALL	2	209,000	0.3
PRAIRIE ASTER	MACHAeranthera TANACEIFOLIA	SUMMER	1	408,000	0.1
PURPLE PRAIRIE CLOVER	DALEA PURPUREUM	SUMMER	1	210,000	0.1
WESTERN YARROW	ACHILLEA MILLEFOLIUM VAR. OCCIDENTALE	SUMMER-FALL	2	2,770,000	0.1
INDIAN COREOPSIS	COREOPSIS TINCTORIA	SUMMER-FALL	1	1,400,000	0.1
PLAINS BLANKET FLOWER	GALLARDA ARISTATA	SUMMER-FALL	1	132,000	0.2
PURPLE CONEFLOWER	ESCHNACIA PURPUREA	SUMMER	1	117,000	0.2
TOTAL			100		15 LBS PLS ³ /AC



- SEDIMENT CONTROL LOG INSTALLATION NOTES**
- SEE PLAN VIEW FOR:
 - LOCATION AND LENGTH OF SEDIMENT CONTROL LOG.
 - SEDIMENT TRAP LOGS INDICATED ON INITIAL GESC PLAN SHALL BE INSTALLED PRIOR TO ANY LAND-DISTURBING ACTIVITIES.
 - SEDIMENT CONTROL LOGS SHALL CONSIST OF STRAW, COMPOST, EXCELICOR, OR COCONUT FIBER.
 - NOT FOR USE IN CONCENTRATED FLOW AREAS.
 - THE SEDIMENT CONTROL LOG SHALL BE TRENCHED IN APPROPRIATELY.
 - 9" DIAMETER SEDIMENT CONTROL LOGS ARE THE MINIMUM BUT A LARGER DIAMETER MAY BE REQUIRED BY THE SEMSWA INSPECTOR.

- SEDIMENT CONTROL LOG MAINTENANCE NOTES**
- THE GESC MANAGER SHALL INSPECT AS NECESSARY TO ENSURE THE ADEQUACY AND FUNCTIONALITY OF THE CONTROL MEASURE.
 - SEDIMENT ACCUMULATED UPSTREAM OF SEDIMENT CONTROL LOGS SHALL BE REMOVED WHEN THE UPSTREAM SEDIMENT DEPTH IS WITHIN 1/2 THE HEIGHT OF THE CREST OF LOG.
 - SEDIMENT CONTROL LOG SHALL BE REMOVED AT THE END OF CONSTRUCTION, IF ANY DISTURBED AREA EXISTS AFTER REMOVAL, IT SHALL BE STABILIZED IN A MANNER APPROVED BY THE SEMSWA INSPECTOR.

SEDIMENT CONTROL LOG (17)



- SEDIMENT TRAP INSTALLATION NOTES**
- SEE PLAN VIEW FOR:
 - LOCATION, LENGTH AND WIDTH OF SEDIMENT TRAP.
 - SEDIMENT TRAPS INDICATED ON INITIAL GESC PLAN SHALL BE INSTALLED PRIOR TO ANY LAND-DISTURBING ACTIVITIES.
 - SEDIMENT TRAP BERM SHALL BE CONSTRUCTED FROM MATERIAL FROM EXCAVATION. THE BERM SHALL BE COMPACTED TO 90% OF THE MAXIMUM DENSITY IN ACCORDANCE WITH ASTM D688.
 - TRAP OUTLET SHALL BE CONSTRUCTED WITH 1/2" MIN. RIPRAP WITH A MINIMUM OVERTOPPING OF 6".
 - THE TOP OF THE EARTHEN BERM SHALL ALLOW FOR OVERTOPPING.
 - THE ENDS OF THE RIPRAP OUTLET STRUCTURE SHALL ALLOW FOR OVERTOPPING.
 - OVERTOPPING MUST OCCUR ON A STABILIZED SURFACE TO INCLUDE WELL VEGETATED AREAS, RIP RAP, OR PAVEMENT.
 - SEDIMENT TRAP SIZED TO PROVIDE STORAGE VOLUME EQUAL TO 1800 CUBIC FEET PER UPSTREAM ACRE.

- SEDIMENT TRAP MAINTENANCE NOTES**
- THE GESC MANAGER SHALL INSPECT AS NECESSARY TO ENSURE THE ADEQUACY AND FUNCTIONALITY OF THE CONTROL MEASURE.
 - SEDIMENT ACCUMULATED UPSTREAM OF RIPRAP SHALL BE REMOVED WHEN THE UPSTREAM SEDIMENT DEPTH IS WITHIN 1/2 THE HEIGHT OF THE RIPRAP OUTLET STRUCTURE.
 - SEDIMENT TRAPS SHALL REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVER IS APPROVED BY SEMSWA.
 - WHEN SEDIMENT TRAPS ARE REMOVED THE DISTURBED AREA SHALL BE DRILLED SEEDED AND CRIMP MULCHED OR STABILIZED IN A MANNER APPROVED BY SEMSWA.

SEDIMENT TRAP (18)

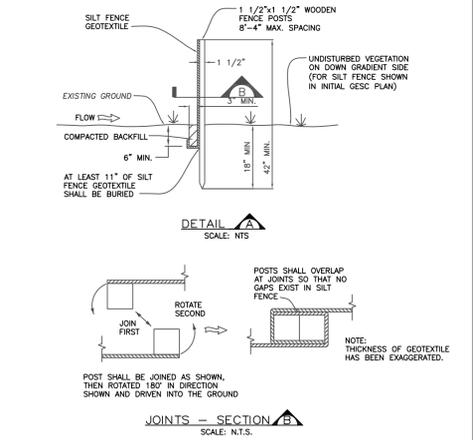
- SEEDING AND MULCHING INSTALLATION NOTES**
- SEE PLAN VIEW FOR:
 - AREA OF SEEDING AND MULCHING.
 - TYPE OF SEED MIX.
 - ALL BRANDS FURNISHED SHALL BE FREE FROM SUCH NOXIOUS SEEDS AS RUSSIAN OR CANADIAN THISTLE, COARSE FESCUE, EUROPEAN BIRCHWEED, JOHNSON GRASS, KNAF WEED AND LEAFY SPURGE.
 - THE SEEDER SHALL FURNISH TO THE CONTRACTOR A SIGNED STATEMENT CERTIFYING THAT THE SEED FURNISHED IS FROM A LOT THAT HAS BEEN TESTED BY A RECOGNIZED LABORATORY, SEED WHICH HAS BECOME WET, MOLDY, OR OTHERWISE DAMAGED IN TRANSIT OR IN STORAGE WILL NOT BE ACCEPTABLE. SEED TICKETS SHALL BE PROVIDED TO SEMSWA UPON REQUEST.
 - DRILL SEEDING MIX SHALL CONFORM TO THE TABLE ON THE RIGHT; UNLESS OTHERWISE APPROVED BY SEMSWA.
 - IF THE SEED AVAILABLE ON THE MARKET DOES NOT MEET THE MINIMUM PURITY AND GERMINATION PERCENTAGES SPECIFIED, THE CONTRACTOR MUST COMPENSATE FOR A LESSER PERCENTAGE OF PURITY OR GERMINATION BY FURNISHING SUFFICIENT ADDITIONAL SEED TO EQUAL THE SPECIFIED PRODUCT. THE TAGS FROM THE SEED MIXES MUST BE SUPPLIED TO CONTRACTOR AND FORWARDED TO THE SEMSWA GESC INSPECTOR.
 - FORMULA USED FOR DETERMINING THE QUANTITY OF PURE LIVE SEED (PLS) SHALL BE (POUNDS OF SEED) X (PURITY X GERMINATION) = POUNDS OF PURE LIVE SEED (PLS).
 - PERMANENT SEED MIX SHALL BE USED UNLESS OTHERWISE APPROVED BY SEMSWA.
 - ALL AREAS TO BE SEEDED AND MULCHED SHALL HAVE NATIVE TOPSOIL OR APPROVED SOIL AMENDMENTS SPREAD TO A DEPTH OF AT LEAST 6 INCHES (LOOSE DEPTH). ALL DISTURBED AREAS SHALL BE LOOSENEED TO A DEPTH OF 6 INCHES PRIOR TO SPREADING TOPSOIL.
 - SOIL IS TO BE THOROUGHLY LOOSENEED (FILLED) TO A DEPTH OF AT LEAST 6 INCHES PRIOR TO SEEDING. THE TOP 6 INCHES OF THE SEED BED SHALL BE GENERALLY FREE OF ROCKS GREATER THAN 4 INCHES AND SOIL CLOSERS GREATER THAN 2 INCHES. SEEDING OVER ANY COMPACTED AREAS THAT HAVING BEEN THOROUGHLY LOOSENEED SHALL BE REJECTED.
 - SEED IS TO BE APPLIED USING A MECHANICAL DRILL TO A DEPTH OF 1/4 INCH. ROW SPACING SHALL BE NO MORE THAN 6 INCHES. MATERIAL USED FOR MULCH SHALL CONSIST OF LONG-STEMMED STRAW. AT LEAST 50 PERCENT OF THE MULCH, BY WEIGHT, SHALL BE AS LONG AS POSSIBLE IN LENGTH. MULCH SHALL BE APPLIED AND MECHANICALLY ANCHORED TO A DEPTH OF AT LEAST 3 INCHES. MULCH SHALL BE APPLIED AT A RATE OF 2000 LB. OF STRAW PER ACRE.
 - IF THE PERMITS DEMONSTRATES TO SEMSWA THAT IT IS NOT POSSIBLE TO DRILL SEED, SEED IS TO BE UNIFORMLY BROADCAST AT TWO TIMES THE DRILLED RATE, THEN LIGHTLY HARROWED TO PROVIDE A SEED DEPTH OF APPROXIMATELY 1/4 INCH. THEN ROLLED TO COMPACT, THEN MULCHED AS SPECIFIED ABOVE.
 - WHEN SEEDING AND MULCHING IS USED TO STABILIZED DISTURBED AREAS, ALL DISTURBED AREAS WHICH ARE EITHER FINAL GRADED, OR WILL REMAIN INACTIVE FOR A PERIOD OF MORE THAN 30 DAYS SHALL BE REQUIRED TO BE STABILIZED WITHIN 14 DAYS OF THE COMPLETION OF THE GRADING ACTIVITIES. THIS MAY REQUIRE MULTIPLE MOBILIZATIONS FOR SEEDING AND MULCHING.
 - MULCH SHALL BE APPLIED WITHIN 24-HOURS OF SEEDING.
 - TACKIFIER SHALL BE UTILIZED TO HELP WITH STRAW DISPLACEMENT.
- SEEDING AND MULCHING MAINTENANCE NOTES**
- SEEDED AND MULCHED AREAS SHALL BE INSPECTED FOR REQUIRED COVERAGE MONTHLY UNTIL FINAL ACCEPTANCE IS ISSUED. REPAIRS AND RE-SEEDING AND MULCHING SHALL BE UNDERTAKEN AFTER THE FIRST GROWING SEASON FOR ANY AREAS FAILING TO MEET THE REQUIRED COVERAGE.
 - REQUIRED COVERAGE FOR STANDARD, OPEN SPACE AND LOW GROWTH SEED MIXES SHALL BE DEFINED AS FOLLOWS:
 - 70% OF THE EXISTING/ PRE-CONSTRUCTION CONDITION.
 - FREE OF ERODED AREAS.
 - FREE FROM INFESTATION OF NOXIOUS WEEDS IN ACCORDANCE WITH THE GESC CRITERIA MANUAL.
 - RILL AND GULLY EROSION SHALL BE FILLED WITH TOPSOIL PRIOR TO RESEEDING. THE RESEEDING METHOD SHALL BE APPROVED BY SEMSWA.

TEMPORARY DRILL SEEDING MIX

SPECIES	VARIETY	NOTES	% IN MIX	POUNDS OF PLS PER ACRE
SMOOTH BROMEGRASS	LINCOLN	PICS	30	3.9
INTERMEDIATE WHEATGRASS	GAHE	PICS	30	4.5
PURISCENT WHEATGRASS	LUNA	PICS	30	4.2
ANNUAL RYEGRASS	N/A	ACB	10	0.8
TOTAL			100	13.4

NOTES: P=PERENNIAL, A=ANNUAL, H=INTRODUCED, C=COOL SEASON, S=SOO FLOWER, B=BROMEGRASS

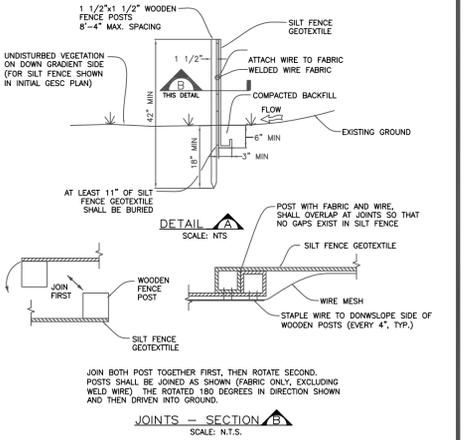
SEEDING AND MULCHING (19)



- SILT FENCE INSTALLATION NOTES**
- SEE PLAN VIEW FOR:
 - LOCATION AND LENGTH OF FENCE.
 - ANCHOR TRENCH SHALL BE EXCAVATED WITH TRENCHER, OR WITH SILT FENCE INSTALLATION MACHINE; NO ROAD GRADERS, BACKHOES, ETC. SHALL BE USED. TRENCH SHALL BE COMPACTED BY HAND, WITH "JUMPING JACK", OR BY WHEEL ROLLING. COMPACTION SHALL BE SUCH THAT SILT FENCE RESISTS BEING PULLED OUT OF ANCHOR TRENCH BY HAND.
 - SILT FENCE GEOTEXTILE SHALL MEET THE FOLLOWING REQUIREMENTS:
 - 6-TO 12-GALLONS PER MINUTE PER SQUARE FOOT FLOW CAPACITY.
 - 90 LB. TENSILE STRENGTH PER ASTM D4822.
 - UV RESIST AT 500 HRS MIN. 70% STRENGTH RETAINED PER ASTM D 4355.
 - SILT FENCE INDICATED ON INITIAL GESC PLAN SHALL BE INSTALLED PRIOR TO ANY LAND-DISTURBING ACTIVITIES.

- SILT FENCE MAINTENANCE NOTES**
- THE GESC MANAGER SHALL INSPECT AS NECESSARY TO ENSURE THE ADEQUACY AND FUNCTIONALITY OF THE CONTROL MEASURE.
 - SEDIMENT ACCUMULATED UPSTREAM OF SILT FENCE SHALL BE REMOVED WHEN THE UPSTREAM SEDIMENT REACHES 25%.
 - SILT FENCE SHALL BE REMOVED WHEN THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVER IS APPROVED BY SEMSWA. IF ANY DISTURBED AREA EXISTS AFTER REMOVAL, IT SHALL BE SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY SEMSWA.

SILT FENCE (20)



- SILT FENCE REINFORCED INSTALLATION NOTES**
- SEE PLAN VIEW FOR:
 - LOCATION AND LENGTH OF FENCE.
 - ANCHOR TRENCH SHALL BE EXCAVATED WITH TRENCHER, OR WITH SILT FENCE INSTALLATION MACHINE; NO ROAD GRADERS, BACKHOES, ETC. SHALL BE USED. TRENCH SHALL BE COMPACTED BY HAND, WITH "JUMPING JACK", OR BY WHEEL ROLLING. COMPACTION SHALL BE SUCH THAT SILT FENCE RESISTS BEING PULLED OUT OF ANCHOR TRENCH BY HAND.
 - SILT FENCE GEOTEXTILE SHALL MEET THE FOLLOWING REQUIREMENTS:
 - 6-TO 12-GALLONS PER MINUTE PER SQUARE FOOT FLOW CAPACITY.
 - 90 LB. TENSILE STRENGTH PER ASTM D4822.
 - UV RESIST AT 500 HRS MIN. 70% STRENGTH RETAINED PER ASTM D 4355.
 - SILT FENCE INDICATED ON INITIAL GESC PLAN SHALL BE INSTALLED PRIOR TO ANY LAND-DISTURBING ACTIVITIES.

- SILT FENCE REINFORCED MAINTENANCE NOTES**
- THE GESC MANAGER SHALL INSPECT AS NECESSARY TO ENSURE THE ADEQUACY AND FUNCTIONALITY OF THE CONTROL MEASURE.
 - SEDIMENT ACCUMULATED UPSTREAM OF SILT FENCE SHALL BE REMOVED WHEN THE UPSTREAM SEDIMENT REACHES 25%.
 - SILT FENCE SHALL BE REMOVED WHEN THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVER IS APPROVED BY SEMSWA. IF ANY DISTURBED AREA EXISTS AFTER REMOVAL, IT SHALL BE SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY SEMSWA.

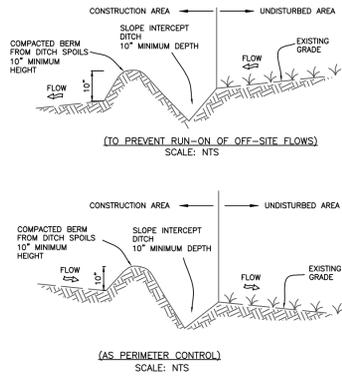
SILT FENCE REINFORCED (21)

UTILITY NOTIFICATION CENTER OF COLORADO
CALL BEFORE YOU DIG
811
Call 2 days prior to any digging, grading or excavating for the marking of underground member utilities

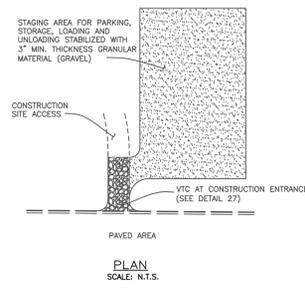
SOUTHEAST METRO STORMWATER AUTHORITY
7437 SOUTH FAIRPLAY STREET
CENTENNIAL COLORADO
80112-4486
(303) 858-8844 - INSPECTION DIVISION



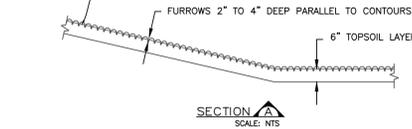
GRADING EROSION AND SEDIMENT CONTROL
STANDARD NOTES AND DETAILS
REVISED APRIL 2019
GESC SHEET 3 OF 4



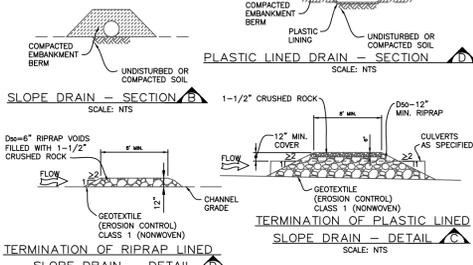
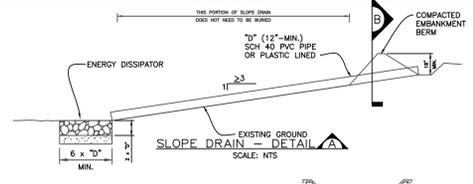
- SLOPE INTERCEPT DITCH INSTALLATION NOTES**
1. MATERIALS CUT OUT OF DITCH TO FORM A COMPACTED BERM ADJACENT TO AND ON THE CONSTRUCTION AREA SIDE OF DITCH.
 2. SLOPE INTERCEPT DITCH SHALL HAVE A MINIMUM DEPTH OF 10".
 3. COMPACTED BERM SHALL HAVE A MINIMUM HEIGHT OF 10".
 4. SLOPE INTERCEPT DITCH SHALL BE CUT IN ON THE CONTOUR.
 5. SLOPE INTERCEPT DITCH CAN BE USED IN PLACE OF SILT FENCE (SF) AND SEDIMENT CONTROL LOGS (SCL).
 6. SEE PLAN VIEW FOR LOCATION.
- SLOPE INTERCEPT DITCH MAINTENANCE NOTES**
1. THE GESC MANAGER SHALL INSPECT AS NECESSARY TO ENSURE THE ADEQUACY AND FUNCTIONALITY OF THE CONTROL MEASURE.
 2. SEDIMENT ACCUMULATED IN DITCH SHALL BE REMOVED WHEN DITCH BECOMES 1/2 FULL. REMOVED SEDIMENT SHALL BE PLACED ON AND COMPACTED WITH THE ADJACENT BERM.
 3. BERM MATERIAL TO FILL DITCH UPON COMPLETION OF CONSTRUCTION. ALL DISTURBED AREAS TO BE SEEDED AND CRIMP MULCHED PER DETAIL 19.



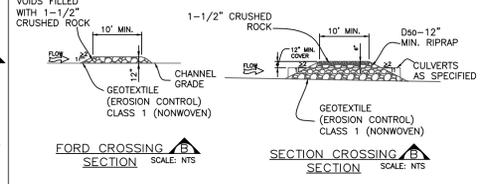
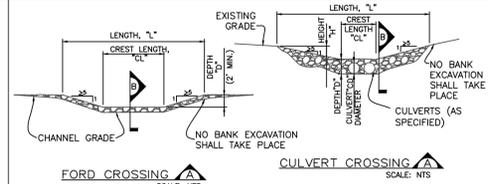
- STABILIZED STAGING AREA INSTALLATION NOTES**
1. SEE PLAN VIEW FOR GENERAL LOCATION OF STAGING AREA. CONTRACTOR MAY MODIFY LOCATION AND SIZE OF STABILIZED STAGING AREA WITH SEMSWA APPROVAL.
 2. STABILIZED STAGING AREA SHALL BE LARGE ENOUGH TO FULLY CONTAIN PARKING, STORAGE, AND UNLOADING AND LOADING OPERATIONS.
 3. IF REQUIRED BY SEMSWA, SITE ACCESS ROADS SHALL BE STABILIZED IN THE SAME MANNER AS THE STAGING AREA.
 4. STAGING AREA SHALL BE STABILIZED PRIOR TO ANY OTHER OPERATIONS ON THE SITE.
 5. THE STABILIZED STAGING AREA SHALL CONSIST OF A MINIMUM OF 3" OF GRANULAR MATERIAL (GRAVEL).
- STABILIZED STAGING AREA MAINTENANCE NOTES**
1. THE GESC MANAGER SHALL INSPECT AS NECESSARY TO ENSURE THE ADEQUACY AND FUNCTIONALITY OF THE CONTROL MEASURE.
 2. GESC MANAGER SHALL PROVIDE ADDITIONAL THICKNESS OF GRANULAR MATERIAL IF ANY RUTTING OCCURS OR UNDERLYING SUBGRADE BECOMES EXPOSED.
 3. STABILIZED STAGING AREA SHALL BE ENLARGED IF NECESSARY TO CONTAIN PARKING, STORAGE, AND UNLOADING AND LOADING OPERATIONS.
 4. ANY ACCUMULATED DIRT OR MUD SHALL BE REMOVED FROM THE SURFACE OF THE STABILIZED STAGING AREA.
 5. THE STABILIZED STAGING AREA SHALL BE REMOVED AT THE END OF CONSTRUCTION. THE GRANULAR MATERIAL SHALL BE REMOVED OR, IF APPROVED BY SEMSWA, USED ON SITE, AND THE AREA TOPSOILED, DRILL SEEDED AND CRIMP MULCHED OR OTHERWISE STABILIZED.



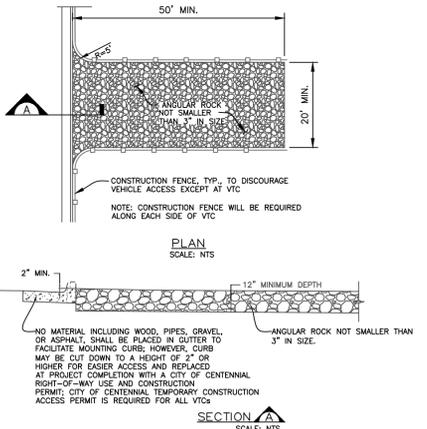
- SURFACE ROUGHENING INSTALLATION NOTES**
1. SURFACE ROUGHENING SHALL BE PROVIDED ON ALL FINISHED GRADES (SLOPES AND FLAT AREAS) WITHIN 2 DAYS OF COMPLETION OF FINISHED GRADE (FOR AREAS NOT RECEIVING TOPSOIL) OR WITHIN 2 DAYS OF TOPSOIL PLACEMENT.
 2. AREAS WHERE BUILDING FOUNDATIONS, PAVEMENT, OR SOD IS TO BE PLACED WITHIN 7-DAYS OF FINISHED GRADING DO NOT NEED TO BE SURFACE ROUGHENED.
 3. DISTURBED SURFACES SHALL BE ROUGHENED USING RIPPING OR TILLING EQUIPMENT ON THE CONTOUR OR TRACKING UP AND DOWN A SLOPE USING EQUIPMENT TREADS.
- SURFACE ROUGHENING MAINTENANCE NOTES**
1. THE GESC MANAGER SHALL INSPECT AS NECESSARY TO ENSURE THE ADEQUACY AND FUNCTIONALITY OF THE CONTROL MEASURE.
 2. VEHICLES AND EQUIPMENT SHALL GENERALLY BE CONFINED TO ACCESS DRIVES AND SHALL NOT BE DRIVEN OVER AREAS THAT HAVE BEEN SURFACE ROUGHENED.
 3. IN NON-TURF GRASS FINISHED AREAS, SEEDING AND MULCHING SHALL TAKE PLACE DIRECTLY OVER SURFACE ROUGHENED AREAS WITHOUT FIRST SMOOTHING OUT THE SURFACE.
 4. IN AREAS NOT SEEDED AND MULCHED AFTER SURFACE ROUGHENING, SURFACES SHALL BE RE-ROUGHENED AS NECESSARY TO MAINTAIN GROOVE DEPTH AND SMOOTH OVER ANY RILL EROSION.



- SLOPE DRAIN INSTALLATION NOTES**
1. SEE PLAN VIEW FOR:
 - LOCATION AND LENGTH OF SLOPE DRAIN.
 - PIPE DIAMETER, "D", AND RIPRAP SIZE, "D₅₀".
 2. SLOPE DRAIN DIMENSIONS SHALL BE CONSIDERED MINIMUM DIMENSIONS; CONTRACTOR MAY ELECT TO INSTALL LARGER FACILITIES. ANY DAMAGE TO SLOPE OR SLOPE DRAIN DURING RUNOFF EVENTS SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
 3. SLOPE DRAINS INDICATED ON INITIAL GESC PLAN SHALL BE INSTALLED PRIOR TO ANY UPSTREAM LAND-DISTURBING ACTIVITIES.
 4. FOR TEMPORARY SLOPE DRAINS, PIPE MAY BE INSTALLED ON TOP OF SLOPE; HOWEVER, 12" MIN. COVER AT TOP OF SLOPE SHALL BE PROVIDED.
 5. AN ENERGY DISSIPATOR SHALL BE PLACED AT THE OUTFALL OF THE SLOPE DRAIN.
- SLOPE DRAIN MAINTENANCE NOTES**
1. THE GESC MANAGER SHALL INSPECT AS NECESSARY TO ENSURE THE ADEQUACY AND FUNCTIONALITY OF THE CONTROL MEASURE.
 2. TEMPORARY SLOPE DRAINS ARE TO REMAIN IN PLACE UNTIL NO LONGER NEEDED, BUT SHALL BE REMOVED PRIOR TO THE END OF CONSTRUCTION. WHEN SLOPE DRAINS ARE REMOVED, THE DISTURBED AREA SHALL BE DRILL SEEDED AND CRIMP MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY SEMSWA.

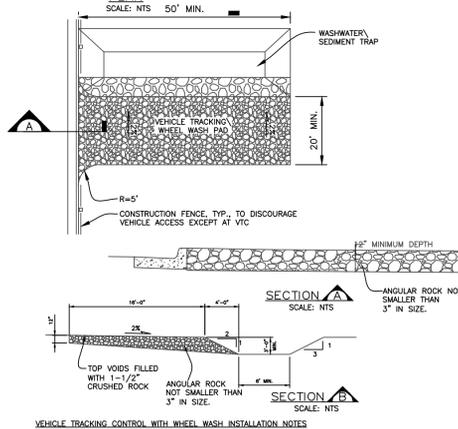


- TEMPORARY STREAM CROSSING INSTALLATION NOTES**
1. SEE PLAN VIEW FOR:
 - LOCATIONS OF TEMPORARY STREAM CROSSING.
 - LENGTH, "L", CREST LENGTH, "CL", CROSSING HEIGHT, "H", DEPTH, "D", CULVERT DIAMETER, "CD", AND NUMBER, TYPE AND CLASS OR GAUGE OF CULVERTS.
 2. TEMPORARY STREAM CROSSING DIMENSIONS, D₅₀, AND NUMBER OF CULVERTS INDICATED (FOR CULVERT CROSSING) SHALL BE CONSIDERED MINIMUM DIMENSIONS; ENGINEER MAY ELECT TO INSTALL LARGER FACILITIES. ANY DAMAGE TO STREAM CROSSING OR EXISTING STREAM CHANNEL DURING BASEFLOW OR FLOOD EVENTS SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
 3. SEE SHEET 1 FOR RIPRAP AND 1-1/2" CRUSHED ROCK GRADATIONS.
 4. FOR A TEMPORARY STREAM CROSSING THAT WILL CARRY LOADS, THE TEMPORARY STREAM CROSSING MUST BE DESIGNED BY THE DESIGN ENGINEER, AND OLY USED IF APPROVED BY SEMSWA.
- TEMPORARY STREAM CROSSING MAINTENANCE NOTES**
1. THE GESC MANAGER SHALL INSPECT AS NECESSARY TO ENSURE THE ADEQUACY AND FUNCTIONALITY OF THE CONTROL MEASURE.
 2. SEDIMENT ACCUMULATED UPSTREAM OF STREAM CROSSINGS SHALL BE REMOVED WHEN THE SEDIMENT DEPTH UPSTREAM OF CROSSING IS WITHIN 50% OF THE CREST (FORD CROSSING) OR GREATER THAN AN AVERAGE DEPTH OF 50% (CULVERT CROSSING).
 3. STREAM CROSSINGS ARE TO REMAIN IN PLACE UNTIL NO LONGER NEEDED, BUT SHALL BE REMOVED PRIOR TO THE END OF CONSTRUCTION.
 4. WHEN STREAM CROSSINGS ARE REMOVED, THE DISTURBED AREA SHALL BE DRILL SEEDED AND CRIMP MULCHED AND COVERED WITH EROSION CONTROL BLANKET OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE SEMSWA.



- VEHICLE TRACKING CONTROL INSTALLATION NOTES**
1. VEHICLE TRACKING CONTROL PADS SHALL BE INSTALLED AT EVERY EXIT POINT OF THE SITE.
 2. VEHICLE TRACKING CONTROL PADS SHALL CONSIST OF HARD, DENSE, DURABLE STONE, ANGULAR IN SHAPE AND RESISTANT TO WEATHERING. ROUNDED STONE OR BOULDERS WILL NOT BE ACCEPTABLE. THE STONES SHALL NOT BE SMALLER THAN 3" IN SIZE. THE STONE SHALL HAVE A SPECIFIC GRAVITY OF AT LEAST 2.6. CONTROL OF GRADATION WILL BE BY VISUAL INSPECTIONS.
 3. ANY CRACKED OR DAMAGED CURB AND GUTTER AND SIDEWALK SHALL BE REPLACED BY PERMITTEE.

- VEHICLE TRACKING CONTROL MAINTENANCE NOTES**
1. THE GESC MANAGER SHALL INSPECT AS NECESSARY TO ENSURE THE ADEQUACY AND FUNCTIONALITY OF THE CONTROL MEASURE.
 2. VEHICLE TRACKING CONTROL SHALL BE REMOVED AT THE END OF CONSTRUCTION. THE ROCK MATERIAL REMOVED OR, IF APPROVED BY SEMSWA, USED ON SITE, AND THE AREA TOPSOILED, DRILL SEEDED AND CRIMP MULCHED OR OTHERWISE STABILIZED.



- VEHICLE TRACKING CONTROL WITH WHEEL WASH INSTALLATION NOTES**
1. SEMSWA RESERVES THE RIGHT TO REQUIRE VEHICLE TRACKING CONTROL WITH WHEEL WASH FACILITIES AT SITES WHERE TRACKING ONTO PAVED AREAS BECOMES A SIGNIFICANT PROBLEM.
 2. IF VEHICLE TRACKING CONTROL WITH WHEEL WASH FACILITIES ARE REQUIRED, ALL WHEELS ON EVERY VEHICLE LEAVING THE SITE SHALL BE CLEANED OF MUD USING A PRESSURE-WASHER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A WATER SOURCE.
 3. VEHICLE TRACKING CONTROL PADS SHALL CONSIST OF HARD, DENSE, DURABLE STONE, ANGULAR IN SHAPE AND RESISTANT TO WEATHERING. ROUNDED STONE OR BOULDERS WILL NOT BE ACCEPTABLE. THE STONES SHALL NOT BE SMALLER THAN 3" IN SIZE. THE STONE SHALL HAVE A SPECIFIC GRAVITY OF AT LEAST 2.6. CONTROL OF GRADATION WILL BE BY VISUAL INSPECTIONS.
 4. ANY CRACKED OR DAMAGED CURB AND GUTTER AND SIDEWALK SHALL BE REPLACED BY CONTRACTOR.

- VEHICLE TRACKING CONTROL WITH WHEEL WASH MAINTENANCE NOTES**
1. THE GESC MANAGER SHALL INSPECT AS NECESSARY TO ENSURE THE ADEQUACY AND FUNCTIONALITY OF THE CONTROL MEASURE.
 2. ACCUMULATED SEDIMENT IN THE WASHWATER/SEDIMENT TRAP SHALL BE REMOVED WHEN THE SEDIMENT DEPTH REACHES AN AVERAGE OF 12-INCHES.
 3. VEHICLE TRACKING CONTROL WITH WHEEL WASH FACILITY SHALL BE REMOVED AT THE END OF CONSTRUCTION. THE RIPRAP MATERIAL REMOVED OR, IF APPROVED BY THE COUNTY, USED ON SITE, AND THE AREA TOPSOILED, DRILL SEEDED AND CRIMP MULCHED OR OTHERWISE STABILIZED.



UTILITY NOTIFICATION CENTER OF COLORADO
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811
Call 2 days prior to any digging, grading or excavating for the marking of underground member utilities

SOUTHEAST METRO STORMWATER AUTHORITY
7437 SOUTH FAIRPLAY STREET
CENTENNIAL COLORADO
80112-4486
(303) 858-8844 - INSPECTION DIVISION



GRADING EROSION AND SEDIMENT CONTROL
STANDARD NOTES AND DETAILS
REVISED APRIL 2019

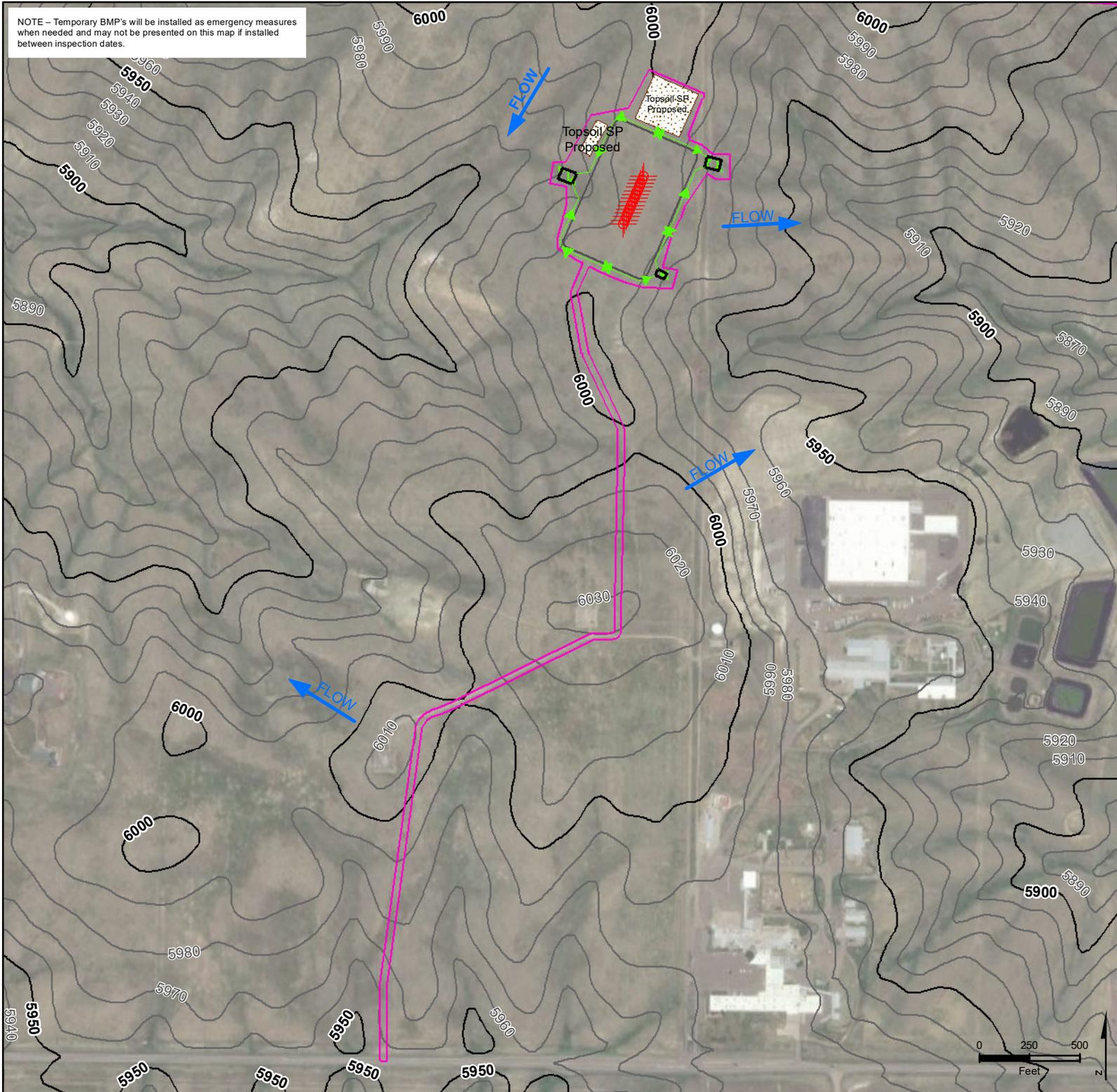
GESC SHEET 4 OF 4



VALID ONLY IF FIRST PAGE IS SIGNED

APPENDIX D
STORMWATER MANAGEMENT PLAN MAP

NOTE - Temporary BMP's will be installed as emergency measures when needed and may not be presented on this map if installed between inspection dates.



**Alamosa 5-64 6-1
Access Road
39.649750 / -104.586064**

Legend

- Proposed Ditch & Berm
- Proposed Pad Surface
- Soil Stockpile
- Construction Site Boundary
- Proposed Sediment Trap

Pollution Sources

- Port-o-let
- Equipment Storage
- Light Plant
- Secondary Containment
- Flare Stack
- Proposed Well

- 1 - Lubricant Storage
- 2 - Septic Tank
- 3 - Dry Chemical Storage
- 4 - Chemical Storage
- 5 - Fuel Tank
- 6 - Used Oil
- 7 - Generator
- 8 - Mud Tank
- 9 - Mud Pit
- 10 - Centrifuge
- 11 - Shaker
- 12 - Shale Bin
- 13 - Dewatering Skid
- 14 - Boiler House
- 15 - Fuel Transfer
- 16 - Dumpster
- 17 - Pump Truck
- 18 - Flowback Tank
- 19 - Filter Pod
- 20 - Frac Tank
- 21 - Crude Oil Tank
- 22 - Produced Water Tank
- 23 - Separator
- 24 - Combustor Unit
- 25 - Compressor
- 26 - Chemical Inj. Tank
- 27 - LACT Unit / Meter House
- 28 - Hydrovac Off-Load
- 29 - Concrete Washout
- 30 - Cuttings Storage
- 31 - Snow/Mud Storage
- 32 - Vapor Recovery Unit
- 33 - Cement Tank
- 34 - Concrete Solidification Bin
- 35 - Bore Pit
- 36 - Sand Tank
- 37 - Riser
- 38 - Transformer

Site Features

- 1 - Temporary Tank
- 2 - Trailer/Office
- 3 - Drill Rig
- 4 - Pipe Rack
- 5 - Data Van
- 6 - Water Tank
- 7 - Mod Tank
- 9 - Dewatering Ops

Feature symbols not to scale

Inspector:
Inspection Date: 2022

Site Characteristics

Legal Location: NENE, Sec 5 and 6, T5S R64W
 County: Arapahoe
 Land Use: Cropland
 Pre-Construction Vegetation Coverage: NA
 Pre-Construction Vegetation Cover: Grassland
 Topography: 9-30% Slopes
 Runoff Risk: High
 Total Disturbed Area: 16.3 Acres
 Soil Type: Renohill-Lite-Thedalund complex
 Receiving Waters: Intermittent stream
 1,372-ft W

REVISED	BY	COMMENT
3/3/2022	MJW	Map Updated



NOTE - Temporary BMP's will be installed as emergency measures when needed and may not be presented on this map if installed between inspection dates.



**Alamosa 5-64 6-1
Well Pad
39.649750 / -104.586064**

Legend

- Proposed Ditch & Berm
- Proposed Pad Surface
- Soil Stockpile
- Construction Site Boundary
- Proposed Sediment Trap

Pollution Sources

- Port-o-let
 - Equipment Storage
 - Light Plant
 - Secondary Containment
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- 9 - Dewatering Ops

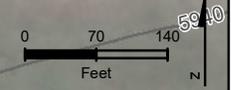
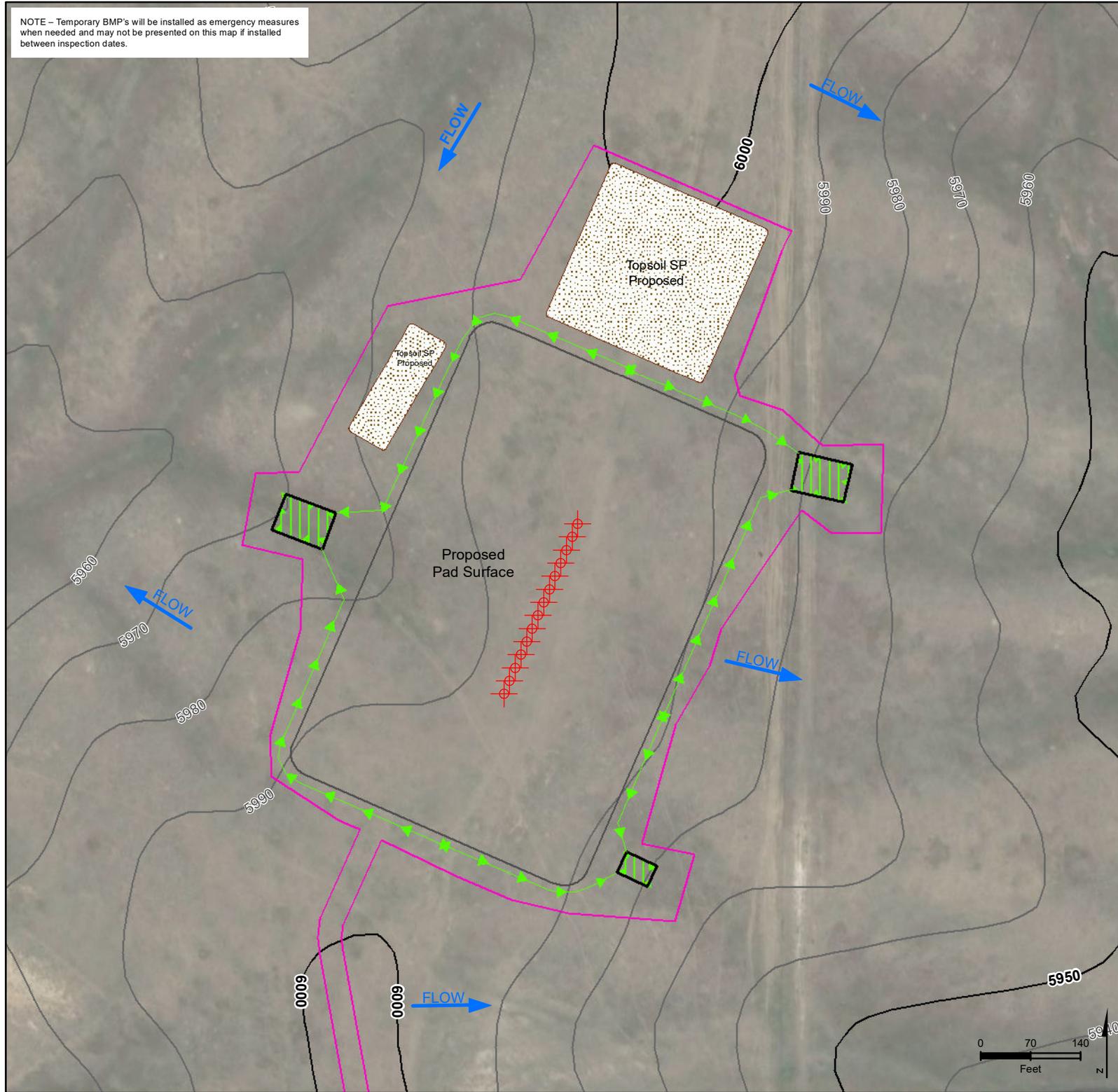
Feature symbols not to scale

Inspector:
Inspection Date: 2022

Site Characteristics

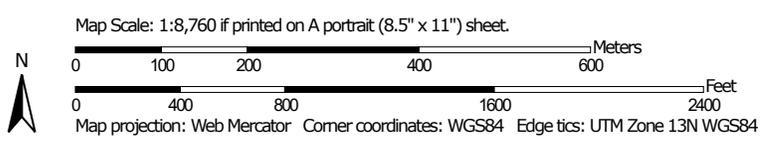
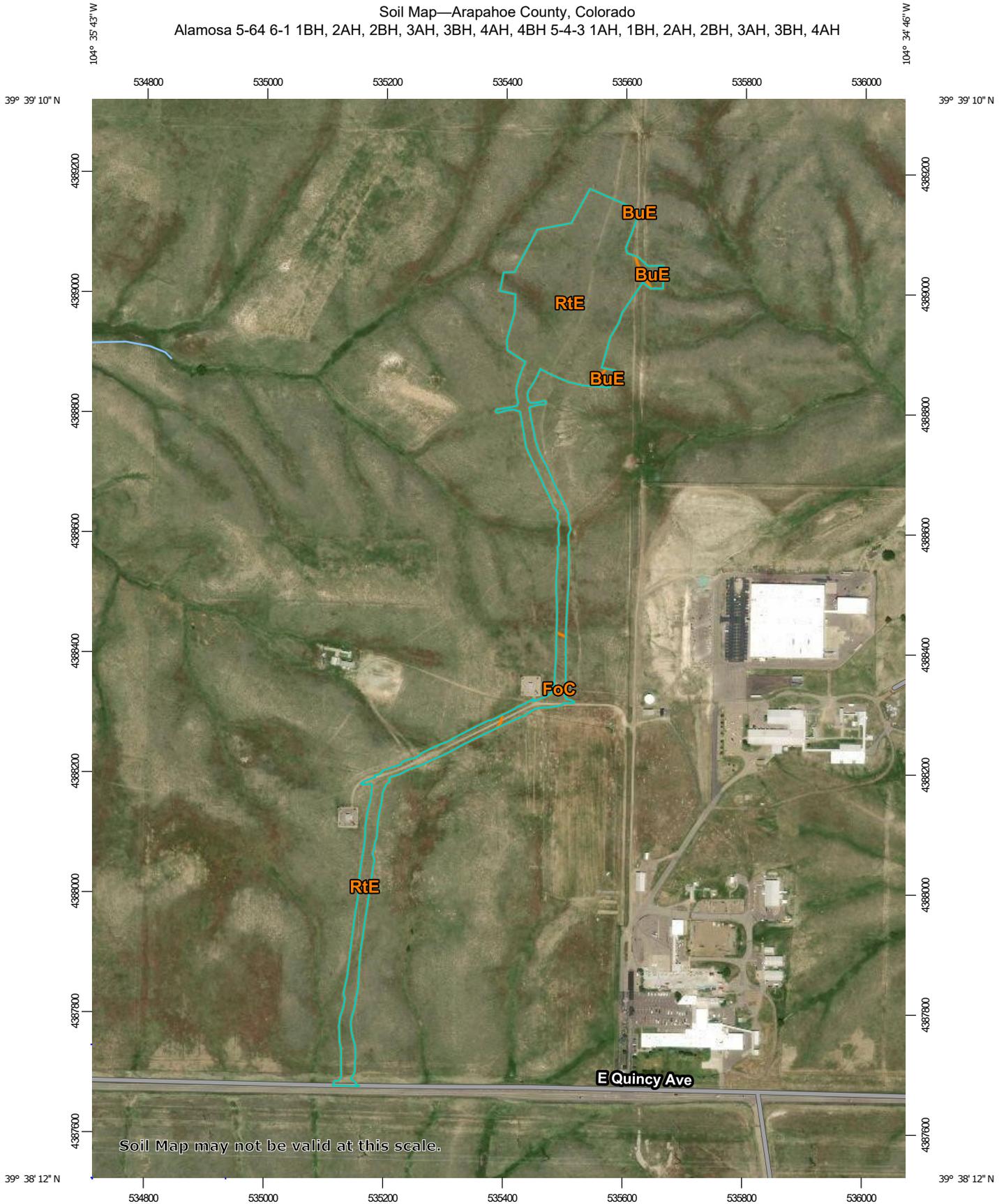
Legal Location: NENE, Sec 5 and 6, T5S R64W
 County: Arapahoe
 Land Use: Cropland
 Pre-Construction Vegetation Coverage: NA
 Pre-Construction Vegetation Cover: Grassland
 Topography: 9-30% Slopes
 Runoff Risk: High
 Total Disturbed Area: 16.3 Acres
 Soil Type: Renohill-Lite-Thedalund complex
 Receiving Waters: Intermittent stream
 1,372-ft W

REVISED	BY	COMMENT
3/3/2022	MJW	Map Updated



APPENDIX E
USDA WEB SOIL SURVEY

Soil Map—Arapahoe County, Colorado
Alamosa 5-64 6-1 1BH, 2AH, 2BH, 3AH, 3BH, 4AH, 4BH 5-4-3 1AH, 1BH, 2AH, 2BH, 3AH, 3BH, 4AH



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 1:20,000.

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: Arapahoe County, Colorado
Survey Area Data: Version 17, Aug 31, 2021

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

Date(s) aerial images were photographed: Jul 17, 2015—Oct 2, 2017

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
BuE	Bresser-Stapleton sandy loams, 9 to 20 percent slopes	0.5	2.4%
FoC	Fondis-Colby silt loams, 3 to 5 percent slopes	0.9	4.8%
RtE	Renohill-Litle-Thedalund complex, 9 to 30 percent slopes	18.1	92.8%
Totals for Area of Interest		19.5	100.0%

APPENDIX F

WATERSHED IMPAIRED WATER BODY REPORT

CDPHE 305(b) Stream and Waterbody Classification

Waterbody ID: COSPMS03a

Listed Portion: COSPMS03a_A	All tributaries to the South Platte River, including all wetlands, from a point immediately below the confluence with Big Dry Creek to the Weld/Morgan County line, except for specific listings in the subbasins of the South Platte River, and in Segments 3			
	Agricultural Use	Aquatic Life Use	Recreational Use	Water Supply Use
	Fully Supporting	Fully Supporting	Fully Supporting	Fully Supporting

Waterbody ID: COSPUS16c

Listed Portion: COSPUS16c_A	All tributaries to the South Platte River, including all wetlands, from the outlet of Chatfield Reservoir, to a point immediately below the confluence with Big Dry Creek, except for specific listings in the subbasins of the South Platte River, and in Seg			
	Agricultural Use	Aquatic Life Use	Recreational Use	Water Supply Use
	Fully Supporting	Not Supported	Not Supported	Not Applicable

Source

Colorado Department of Public Health and Environment (CDPHE). 2018. CDPHE GIS Maps (<https://www.colorado.gov/pacific/cdphe/clean-water-gis-maps>). Stream Water Quality Standards

Comments

Key:

WRAP: Watershed Rapid Assessment Program