



STORMWATER MANAGEMENT PLAN (SWMP)

Grandwood Ranch – Final Grading
El Paso County, Colorado
PCD File No. SP 195

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TABLE OF CONTENTS

1.	GENERAL INFORMATION	5
1.1	Site Description	5
1.2	Site Location.....	6
1.3	Project Contact Information	7
1.4	Disturbance Area and Import/Export Volume.....	7
1.5	Construction Activities	7
1.6	Construction Sequencing and Phasing	8
1.7	Soils.....	10
1.8	Vegetation	11
1.9	Allowable Non-Stormwater Discharges	12
1.10	Receiving Waters.....	12
1.11	Stream Crossings within the Project Area	12
1.12	Pollution Sources	12
1.13	Spill Prevention and Response Plan	14
2.	BEST MANAGEMENT PRACTICES	15
2.1	Structural BMPs	16
2.2	Non-Structural BMPs	18
2.3	Housekeeping BMPs	20
2.4	Stormwater Management Plan Non-Applicable Items	22
3.	FINAL STABILIZATION AND LONG-TERM STORMWATER MANAGEMENT	22
3.1	Inspection and Maintenance	23
3.2	BMP Replacement and Failed BMPs	24
3.3	Qualified Inspectors.....	24
3.4	Additional SWMP and BMP Practices.....	24

Attachments

- SWMP Drawings
- SWMP Inspection and Maintenance Log
- Soil Survey of El Paso County Area Soils Map
- FEMA FIRM Floodplain Maps
- CDPHE General Permit

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1. GENERAL INFORMATION

This Stormwater Management Plan (SWMP) is being submitted on behalf of Sylvan Vista, Inc. for a tract of land known as Grandwood Ranch in El Paso County, Colorado. The purpose of this SWMP is to identify potential source areas that may contribute pollutants to stormwater and to identify Best Management Practices (BMP)s that will reduce or eliminate adverse water quality impacts. Development, implementation, and maintenance of this SWMP will provide the general contractor with the framework for reducing soil erosion and minimizing pollutants in stormwater during construction of the project site.

This SWMP has been prepared in accordance with engineering, hydrologic and pollution control practices and will cover this facility only (the extents of the Project construction site) using BMPs to reduce the pollutants in stormwater discharges as described in Section 2 of this SWMP. The SWMP will be administrated by the Qualified Stormwater Manager identified in Section 1.3. The Qualified Stormwater Manager's duties include the following:

- Implement the SWMP
- Oversee installation and maintenance of BMPs as identified in the SWMP
- Implement and oversee employee training
- Conduct or provide for inspection and monitoring activities
- Identify potential pollutant sources and make sure they are included in the SWMP
- Identify any deficiencies in the SWMP and make sure they are corrected
- Ensure that any changes in construction plans, phasing, or use of BMP's are addressed in the SWMP

The provisions of this SWMP must be implemented as they are written and updated, from the initiation of construction until final stabilization is complete. The Water Quality Control Division reserves the right to review the SWMP, and to require the permittee to develop and implement additional measures to prevent and control pollution as is needed.

1.1 Site Description

Grandwood Ranch, located in El Paso County, Colorado, is a 147-acre site which will consist of 48 single-family detached homes. The site is located at Latitude: 39.078334 and Longitude: -104.826220. The Site is bounded to the west by existing Fairplay Drive, to the south by Higby Road, to the north by Furrow Road end platted residential lots, and Colonial Park Drive is east of the site. An early gradig permit was used for initial overlot grading with the approved Grandwood Ranch Pre-Development Grading and Erosion Control Plans.

1.2 Site Location



1.3 Project Contact Information

Contact Information/Responsible Parties			
Owner	William F. Herebic II Sylvan Vista, Inc. 14160 Gleneagle Dr. Colorado Springs, CO 80921		herebic5@msn.com
Project Manager/Site Supervisor	William F. Herebic II Sylvan Vista, Inc. 14160 Gleneagle Dr. Colorado Springs, CO 80921		herebic5@msn.com
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SWMP Preparer	Corey Petersen, PE Matrix Design Group 2435 Research Pkwy Suite 300 Colorado Springs, CO 80920	719-575-0100	Corey.Petersen@matrixdesigngroup.com

1.4 Disturbance Area and Import/Export Volume

The following is the total site area and the expected area of disturbance. Any changes to the area of disturbance (current disturbance) must be updated as changes occur.

Total Site Area	147 acres	Date: 10/18/2020
Initial Estimate of Disturbance Area	22 acres	Date: 10/18/2020
Import/Export Volume Estimate	2,899 CY	<input type="checkbox"/> Import <input checked="" type="checkbox"/> Export
Updated Disturbance Area		
Updated Disturbance Area		
Updated Disturbance Area		

1.5 Construction Activities

Clearing and grubbing, temporary stabilization and overlot grading operations were performed with the Grandwood Ranch Pre-Development Grading and Erosion Control Plans. Final road grading, utility/storm installation, final grading, final stabilization, and removal of temporary control measures will be performed under the Grandwood Ranch Final Grading and Erosion

Control Plans. Initial stabilization methods (BMPs) will be installed prior to construction. Following initial BMPs, construction will consist initially of site clearing and grubbing if necessary, temporary stabilization BMPs, final grading and retaining wall construction utility installation, road paving, final grading, followed by home construction on each lot. Open spaces will be maintained with the vegetation placed prior to commencement of construction. There will be no concrete or asphalt batched onsite. All concrete and asphalt will be imported from offsite batch plants. Final stabilization and removal of temporary control measure will be completed following placement of permanent landscaping and hardscaping.

1.6 Construction Sequencing and Phasing

Construction Schedule		Estimated Start Date	Estimated Completion Date
Anticipated Project Start Date		February 2021	September 2020
1. Install Initial BMPs		February 2021	February 2021
2. Clearing and Grubbing		February 2021	February 2021
3. Temporary Stabilization BMPs		February 2021	February 2021
4. Road Grading		February 2021	February 2021
5. Site Grading		March 2021	April 2021
6. Utility Installation		March 2021	April 2021
7. Street Paving		April 2021	May 2021
8. Vertical Construction		May 2021	April 2022
9. Final Stabilization		April 2022	June 2022
10. Removal of Temporary Control Measures		Upon construction of permanent BMPs and infrastructure and when final vegetative cover density is to be 70% of pre-disturbed levels	Upon construction of permanent BMPs and infrastructure
Anticipated Project End Date			June 2022
Construction Phase	Description and Conservation Measures		
Install Initial BMPs	Silt Fencing (perimeter BMP) will be installed at designated locations (see Plan) as outlined in Section 2. The VTC will be installed at the entrance/exit to any disturbed areas as work progresses as outlined in Section 2. All construction traffic must enter/exit the site at approved construction access points. Sediment basins shall be installed prior to any land-disturbing activities that will rely on the basin for stormwater control (Section 2).		
Clearing and Grubbing	Clearing and Grubbing of the site will be the initial construction phase. BMPs outlined in Section 2 will be used to control erosion and sediment runoff.		

Temporary Stabilization BMPs	Temporary stabilization measures to control erosion and sediment runoff will be implemented as outlined in Section 2.
Site Grading	Erosion and sediment runoff during site grading will be controlled by BMPs outlined in Section 2.
Road Grading	Road grading will be completed using BMPs outlined in Section 2 to control erosion and sediment runoff.
Utility Installation	Following site grading, utility corridors will be constructed beginning with sewer and water and followed by storm sewer. Dry utilities will be constructed last. BMPs outlined in Section 2 will be used to control erosion and sediment runoff.
Final Grading	Final grading will be completed following installation of curb and gutter at the site. BMPs outlined in Section 2 will be used to control erosion and sediment runoff.
Street Paving	Streets and roads will be paved following final site grading activities. BMPs outlined in Section 2 will be used to control erosion and sediment runoff.
Vertical Construction	<p>Vertical construction will be phased on a lot by lot basis as follows: BMPs outlined in Section 2 will be used to control erosion and sediment runoff prior to beginning vertical construction (Initial Phase). The Interim Phase of vertical construction includes foundation excavation and construction, construction of structural framing, exterior completion, and minor utility work. Inlet protection outlined in Section 2 should remain in place during the interim construction phase. Perimeter BMPs as outlined in Section 2 will remain in place. Temporary stabilization BMPs (Section 2) should be implemented on all disturbed areas that are not subject to active construction.</p> <p>The Interim to Final Phase of construction includes interior/exterior structure completion, concrete flatwork, and final lot grading activities. Inlet protection outlined in Section 2 should remain in place during this construction phase. Perimeter BMPs should be evaluated for effectiveness and maintained as needed. Temporary stabilization BMPs should be used on all disturbed areas not subject to active construction activities.</p> <p>Final site grading, cleanup, and landscaping is the Final Phase of vertical construction. In most cases, BMPs can be removed immediately prior to final grading, and landscaping activities. In areas where landscaping and hardscaping are not planned, BMPs should be maintained and temporary stabilization measures should remain in place. Sites should be monitored until stabilization requirements are met.</p>
Final Stabilization and Removal of Temporary BMPs	Once construction activity ceases, the area shall be stabilized with seed and mulch as outlined in Section 2. Final stabilization is complete when all ground disturbing activities are complete and all disturbed areas have either a uniform vegetative cover with an individual plant density of 70% of pre-disturbance levels, or an equivalent permanent alternative stabilization method is implemented. Once stabilization is complete, all temporary sediment and erosion control measures shall be removed.

1.7 Soils

The United States Department of Agriculture, Natural Resources Conservation Service (NRCS); Web Soil Survey of El Paso County Area, Colorado, published by the United States Department of Agriculture, dated September 2019, was utilized to investigate the existing general soil types within and surrounding the Project area. A soil map for this area is provided in the Attachments. Per the information given within the Soil Conservation Survey, hydrologic soil group “B” characteristics are predominant across the study area (an estimated 98% coverage area) as described in the following table.

Soil ID Number	Soil Type	Soil Description	Estimated Coverage Area	Hydrologic Classification
1	Alamosa Loam, 1% to 3% slopes	Surface runoff is very high, poorly-draining soil, the hazard of erosion and soil blowing are slight	2.2 %	D
41	Kettle gravelly loamy sand, 8% to 40% slopes	Surface runoff is moderate, partially-draining soil, the hazard of erosion and soil blowing are moderate	72.4 %	B
42	Kettle-Rock outcrop complex	Surface runoff is moderate, partially-draining soil, the hazard of erosion and soil blowing are moderate	5.2%	B
71	Pring coarse sandy loam, 3% to 8% slopes	Surface runoff is low, well-draining soil, the hazard of erosion and soil blowing are slight	8.4%	B
93	Tomah-Crowfoot complex, 8% to 15% slopes	Surface runoff is moderate, well-draining soil, the hazard of erosion and soil blowing are moderate	11.8 %	B

Runoff coefficients outlined in the City of Colorado Springs Design Criteria Manual and are provided below:

Grandwood Ranch
Stormwater Management Plan

Land Use	5-year	100-year
Historic Analysis	0.09	0.36
Residential, 1 Acre	0.20	0.44
Paved	0.90	0.96

Runoff Coefficients for Rational Method from the Urban Drainage and Flood Control District (UDFCD 2001) are listed below:

Land Use or Surface Characteristics	Percent Impervious	Runoff Coefficients											
		2-year		5-year		10-year		25-year		50-year		100-year	
		HSG A&B	HSG C&D	HSG A&B	HSG C&D	HSG A&B	HSG C&D	HSG A&B	HSG C&D	HSG A&B	HSG C&D	HSG A&B	HSG C&D
Business													
Commercial Areas	95	0.79	0.80	0.81	0.82	0.83	0.84	0.85	0.87	0.87	0.88	0.88	0.89
Neighborhood Areas	70	0.45	0.49	0.49	0.53	0.53	0.57	0.58	0.62	0.60	0.65	0.62	0.68
Residential													
1/8 Acre or less	65	0.41	0.45	0.45	0.49	0.49	0.54	0.54	0.59	0.57	0.62	0.59	0.65
1/4 Acre	40	0.23	0.28	0.30	0.35	0.36	0.42	0.42	0.50	0.46	0.54	0.50	0.58
1/3 Acre	30	0.18	0.22	0.25	0.30	0.32	0.38	0.39	0.47	0.43	0.52	0.47	0.57
1/2 Acre	25	0.15	0.20	0.22	0.28	0.30	0.36	0.37	0.46	0.41	0.51	0.46	0.56
1 Acre	20	0.12	0.17	0.20	0.26	0.27	0.34	0.35	0.44	0.40	0.50	0.44	0.55
Industrial													
Light Areas	80	0.57	0.60	0.59	0.63	0.63	0.66	0.66	0.70	0.68	0.72	0.70	0.74
Heavy Areas	90	0.71	0.73	0.73	0.75	0.75	0.77	0.78	0.80	0.80	0.82	0.81	0.83
Parks and Cemeteries													
Playgrounds	13	0.07	0.13	0.16	0.23	0.24	0.31	0.32	0.42	0.37	0.48	0.41	0.54
Railroad Yard Areas	40	0.23	0.28	0.30	0.35	0.36	0.42	0.42	0.50	0.46	0.54	0.50	0.58
Undeveloped Areas													
Historic Flow Analysis-- Greenbelts, Agriculture	2	0.03	0.05	0.09	0.16	0.17	0.26	0.26	0.38	0.31	0.45	0.36	0.51
Pasture/Meadow	0	0.02	0.04	0.08	0.15	0.15	0.25	0.25	0.37	0.30	0.44	0.35	0.50
Forest	0	0.02	0.04	0.08	0.15	0.15	0.25	0.25	0.37	0.30	0.44	0.35	0.50
Exposed Rock	100	0.89	0.89	0.90	0.90	0.92	0.92	0.94	0.94	0.95	0.95	0.96	0.96
Offsite Flow Analysis (when landuse is undefined)	45	0.26	0.31	0.32	0.37	0.38	0.44	0.44	0.51	0.48	0.55	0.51	0.59
Streets													
Paved	100	0.89	0.89	0.90	0.90	0.92	0.92	0.94	0.94	0.95	0.95	0.96	0.96
Gravel	80	0.57	0.60	0.59	0.63	0.63	0.66	0.66	0.70	0.68	0.72	0.70	0.74
Drive and Walks													
Roofs	90	0.71	0.73	0.73	0.75	0.75	0.77	0.78	0.80	0.80	0.82	0.81	0.83
Lawns	0	0.02	0.04	0.08	0.15	0.15	0.25	0.25	0.37	0.30	0.44	0.35	0.50

All exposed soil throughout the Project site will be landscaped and/or seeded with a locally approved seed mix as described in Section 2.2.

1.8 Vegetation

The existing vegetation consists of native grasses and scrub oak. Based on site visits and a review of aerial photography, the vegetative cover at Grandwood Ranch is approximately 100%.

1.9 Allowable Non-Stormwater Discharges

Uncontaminated groundwater may be discharged onsite, but may not leave the site in the form of surface runoff. Concrete washout areas will be used as described in Section 2.3. Non-stormwater discharges are not anticipated.

1.10 Receiving Waters

Ultimate Receiving Water(s): Jackson Creek

Stormwater Outfalls/Temporary Sediment Basin Discharge:

All low points, that will ultimate convey stormwater via storm sewer system, will be treated with a temporary sediment basin. Future full spectrum detention ponds will be utilized as temporary sediment basins. All sediment basins are shown to treat and convey water to existing low points on the Site that are then conveyed south via existing storm sewer infrastructure.

Designated wetlands are to be avoided during construction activities and to remain undisturbed. All existing vegetation within 50ft of existing wetlands will be maintained and/or returned to existing conditions.

1.11 Stream Crossings within the Project Area

No stream crossings are located within the Project Area.

1.12 Pollution Sources

Pollutants that result from clearing, grading, maintenance, operations, and excavation have the potential to be present in stormwater runoff and are potential sources for stormwater contamination. The following is a description of potential source areas for pollutant that may be released during construction, maintenance, operation, and excavation activities:

Source Area:

1. Disturbed and stored soils, erosion.
2. Vehicle tracking of sediments.
3. Management of contaminated soils.
4. Loading and unloading operations.
5. Outdoor storage activities (erodible building materials, fertilizers, chemicals, etc.).
6. Vehicle and equipment maintenance, cleaning, and fueling operations.
7. Significant dust or particulate generation activities.
8. Routine maintenance activities involving fertilizers, pesticides, herbicides, detergents, fuels, solvents, etc.
9. Onsite waste management practices (waste piles, liquid wastes, dumpsters, chemical containers etc.).
10. Concrete truck/equipment washing
11. Non-industrial waste sources (trash, portable toilets)

The following pollutants may impact stormwater runoff for each of the source areas listed above.

Potential Pollutant	Chemical/Physical Description	Stormwater Impacts	Potential Source Area (listed above)
Pesticides (insecticides, fungicides, herbicides, rodenticides)	Various colored to colorless liquid, powder, pellets, or grains	Chlorinated hydrocarbons, organophosphates, carbamates, arsenic	3, 4, 5, 8, 9
Fertilizer	Liquid or solid grains	Nitrogen, phosphorous	3, 4, 5, 8, 9
Cleaning solvents	Colorless, blue, or yellow-green liquid	Perchloroethylene, methylene chloride, trichloroethylene, petroleum distillates	3, 4, 5, 6, 8, 9, 10, 11
Concrete	White solid	Limestone, sand	3, 5, 9, 10
Paints	Various colored liquid	Metal oxides, stoddard solvent, talc, calcium carbonate, arsenic	3, 5, 6, 9
Wood preservatives	Clear amber or dark brown liquid	Stoddard solvent, petroleum distillates, arsenic, copper, chromium	3, 5, 8
Hydraulic oil/fluids	Brown oily petroleum hydrocarbon	Mineral oil	3, 4, 5, 6, 8, 9
Gasoline	Colorless, pale brown or pink petroleum hydrocarbon	Benzene, ethyl benzene, toluene, xylene, MTBE	2, 3, 4, 5, 6, 8, 9, 10
Diesel Fuel	Clear, blue-green to yellow liquid	Petroleum distillate, oil & grease, naphthalene, xylenes	2, 3, 4, 5, 6, 8, 9, 10
Kerosene	Pale yellow liquid petroleum hydrocarbon	Coal oil, petroleum distillates	5, 6, 8, 9
Antifreeze/coolant	Clear green/yellow liquid	Ethylene glycol, propylene glycol, heavy metals (copper, lead, zinc)	2, 3, 4, 5, 6, 8, 9, 10
Particulates	Dust, airborne particulates	Sediment	1, 2, 4, 5, 6, 10
Biological	Human/animal waste	Bacterial	11

The largest possible sources of non-stormwater pollution will be from trucks during equipment maintenance and refueling operations. The contractor shall be responsible for any spill cleanup during refueling operations in accordance with applicable city, county and state regulations. The contractor will also be responsible for cleanup of any off-site vehicle tracking on paved roads. Other sources of pollution

such as vehicle washing, chemical storage or waste disposal are not anticipated. No recognized environmental conditions (REC) have been identified within Project site.

1.13 Spill Prevention and Response Plan

The Spill Prevention and Response Plan (SPRP) is designed to outline requirements for the handling and management of hazardous substances (pesticides, herbicides, fuels, cleaners, etc.) stored or used at the Project area.

Materials Management and Handling

- Chemicals that have the potential to be released in stormwater are to be used only where necessary and, in a manner, consistent with industry-standard uses and handling procedures.
- Ensure all hazardous materials are properly labeled.
- Store, dispense, and/or use hazardous substances in a way that prevents releases.
- Provide secondary containment when storing hazardous substances in bulk quantities (greater than 55-gallons).
- Maintain good housekeeping practices for chemicals stored onsite.
- Complete routine checks of hazardous substance storage areas.
- Provide monthly inspections of hazardous substance storage areas, secondary containment, and above ground and/or underground storage tanks.

Spill Containment and Reporting

A release of any chemical, oil, petroleum product, sewage, etc. that has the potential to enter surface water, groundwater, dry gullies, or storm sewers leading to surface water must be reported to the CDPHE immediately (25-8-601 CRS). When a spill is identified, the proper spill response should be implemented:

1. Assess the area for any immediate dangers or health and safety concerns. If any immediate dangers are present, call 911.
2. Contain any spilled materials. Assess the size of the leak and immediate threat of the spill reaching storm drains or permeable surfaces. If there is an immediate threat and no safety concerns, attempt to block the spill from reaching storm drains or other impermeable surfaces.
3. Stop the source of the spill if possible.
4. Cleanup spill in a timely manner. Use adsorbent materials (cat litter) and/or sock booms or rags to clean up the spill. Dispose of used materials appropriately.
5. Report and record spills to Qualified Stormwater Manager. Once the spill has been contained and any immediate threat to storm drains or permeable surfaces has been minimized, contact the Qualified Stormwater Manager. If necessary, a specialized cleanup contractor should be used to clean up the remaining contamination.
6. Follow applicable Colorado Discharge Permit System (CDPS) terms and conditions regarding spill reporting and response.

7. Report spills to the Colorado Department of Public Health and Environment (CDPHE). For non-permitted activities or in the case of an activity where a permit does not address reporting of or response to a spill which may cause pollution of surface or subsurface waters of the State, notify the Environmental Release and Incident Reporting Line within 24 hours at **(877) 518-5608**. Reporting should include:
 - a. Name of responsible person or name of Qualified Stormwater Manager
 - b. An estimate of the date and time of the release
 - c. The location of the spill and its source (saddle tank, manhole, storage container, etc.),
 - d. The type of material spilled (untreated wastewater, petroleum products, etc.)
 - e. The estimated volume of the spill
 - f. The time and date the spill was controlled or stopped
 - g. If the spill is ongoing, the estimated rate of flow and when the spill is expected to be controlled/contained
 - h. Measures being taken to contain, reduce, and/or clean the spill
 - i. A list of potentially impacted areas and known downstream water uses that will be or have been notified
 - j. The phone number and email of the Qualified Stormwater Manager.
8. Any accidental discharge to the sanitary sewer system must be reported immediately to the local sewer authority and the affected wastewater treatment plant.
9. Written notification following a reportable spill shall be submitted to the CDPHE within five days (5 CCR 1002-31, Section 61.8(5)(d)).

2. BEST MANAGEMENT PRACTICES

Best Management Practices (BMP's) encompass a wide range of erosion and sediment control practices, both structural and non-structural in nature, that are intended to reduce or eliminate any possible water quality impacts from stormwater leaving a construction site. The individual BMP's appropriate for a particular construction site are largely dependent on the types of potential pollutant sources present, the nature of the construction activity, and specific-site conditions.

Most of the BMP's referenced herein are widely used in the construction industry. They generally involve a simple and low-cost approach and can be very effective *when properly installed and maintained*. To prevent soil from washing into the public right-of way or the undisturbed areas of the site, the following is a discussion of BMPs and an indication of which BMPs are expected to be implemented as part of this Project.

BMPs for all slopes, channels, ditches, or any disturbed land area shall be completed immediately after grading or earth disturbance has occurred. All temporary soil erosion control measures and BMP's shall be maintained until site reaches final stabilization and permanent soil erosion control measures are implemented.

The Qualified Stormwater Manager may modify the planned BMPs based on construction sequencing, site conditions, and/or other factors. The SWMP should be modified by field notes including dates of modifications and the purpose of the modification. The Grading and Erosion Control Plan should reflect what has been constructed or modified onsite. The Qualified Stormwater Manager will be responsible for documenting BMP's (including phasing of BMP implementation).

2.1 Structural BMPs

Structural BMPs are used to minimize erosion and sediment transport and include but are not limited to: silt fencing, erosion control blankets, turf reinforcement mat, wattles/sediment control logs, earth dikes, drainage swales, sediment traps, gravel inlet protection, inlet/outlet protection, straw bales, concrete washout areas, and temporary or permanent sediment basins. Structural BMPs shall be coordinated with construction activities so the BMP is in place before construction begins. The structural BMPs outlined below are general definitions and guidelines. Project-specific specifications for selected BMPs are detailed in the SWMP Drawings included in the Attachments.

- **Silt Fencing:** A silt fence is a structural sediment control device that typically consists of a geotextile fabric attached to wooden stakes inserted into a ground trench and rising to a vertical height of approximately 18-inches. The silt fence is generally used as perimeter sediment control and as a primary containment around storage areas, staging areas, stockpiles, etc.

Used for this project? ☒ Yes ☐ No

Application notes: Temporary perimeter controls (e.g. silt fences) will be installed *before* any clearing and grading begins. The use of rebar, steel stakes, or steel fence posts to anchor silt fencing is prohibited. Once the site is cleaned and the surrounding disturbed areas are 70% established with vegetation, the silt fences around the Project site can be removed.

- **Erosion Control Blanket:** An erosion control blanket (ECB) is a rolled-fiber product typically made up of straw, coconut, or synthetic fibers that are used to prevent scour erosion, stabilize slopes, and to aid revegetation by providing a protective layer over seeded areas. Turf reinforcement mats are similar to ECBs and are made to withstand greater stress such as traffic, extended life, or continuous and frequent water flow. ECBs are available in both biodegradable and photodegradable varieties.

Used for this project? ☒ Yes ☐ No

Application Notes: Exposed slopes greater than 3:1 will be covered by an erosion control blanket. The use of rebar, steel stakes, or steel fence posts to anchor ECB is prohibited.

- **Sediment Control Logs:** SCLs are log-shaped, rolled straw products encased in a polypropylene monofilament filter fabric. SCLs are used for sediment control usually at the perimeter of a disturbance or as a channel check in low flow areas. Wattle can also be used for slope length reduction.

Used for this project? ☒ Yes ☐ No

Application Notes: SCLs that act as perimeter control shall be installed prior to any upgradient land disturbing activities. SCLs may be used as small check dams in ditches and swales, however they should not be used in perennial streams or high velocity drainage ways.

- **Inlet Protection (gravel):** Storm sewer inlet protection is typically comprised of 1.5-inch angular rock (gravel) wrapped in a chicken wire mesh to form an approximate 6-inch diameter roll in varying lengths. The gravel roll should be firmly secured in front of the inlet opening with a spacing device to prevent the roll from entering the inlet. A sufficiently-sized overflow opening should be left to prevent flooding during high surface water flow volumes. The basic design applies to curb and drop-style inlets.

Used for this project? ☐ Yes ☒ No

Application Notes: Inlet protection measures for existing inlets shall be installed *before* clearing and grading is initiated.

- **Inlet/Outlet Protection:** Inlet/outlet protection can be composed of 4- to 6-inch rock (rip-rap) underlain with geotextile fabric placed at the outlet or inlet of a drainage pipe, culvert, or other areas where high surface water flow may be encountered. Geotextile socks filled with gravel may also be used as a temporary BMP. This BMP is used to reduce erosion sediment transport by reducing flow velocity.

Used for this project? ☒ Yes ☐ No

Application Notes: Temporary rip rap outlet protection specified in the SWMP specification drawings is for outlets intended to be utilized less than 2 years. Rough cut street control measures (geotextile socks filled with gravel or compacted earthen berms) shall be installed after a road has been cut and will not be paved for more than 14 days, or for temporary construction roads that have not received road base.

- **Straw Bale Barriers:** Bound straw bale barriers (SBB) are typically used for inlet protection or as drainage swale check dams. Installation of the bales is critical to avoid erosion at the ends of the bales.

Used for this project? ☒ Yes ☐ No

Application Notes: Straw bales shall consist of certified weed-free straw or hay and shall consist of approximately 5 cubic feet of straw or hay. Straw bales must weigh at least 35 pounds.

- **Check Dams:** Check dams are temporary grade control structures placed in drainage channels to limit the erosivity of stormwater by reducing flow velocity. Check dams are typically constructed from rock, gravel bags, sand bags, or sometimes, proprietary devices. Reinforced check dams are typically constructed from rock and wire gabion. Although the primary function of check dams is to reduce the velocity of concentrated flows, a secondary benefit is sediment trapping upstream of the structure.

Used for this project? ☒ Yes ☐ No

Application Notes: When rock is used for the check dam, place rock mechanically or by hand. Do not dump rocks into the drainage channel. Where multiple check dams are used, the top of the lower dam should be at the same elevation as the toe of the upper dam. When reinforced check dams are used, install erosion control fabric under and around the check dam to prevent erosion on the upstream and downstream sides. Each section of the dam should be keyed in to reduce the potential for washout or undermining. A rock apron upstream and downstream of the dam may be necessary to further control erosion.

- *Sediment/Detention Basins:* Sediment/Detention basins are designed according to project size and runoff volume and are used for flood control and to aid in temporary retention of runoff to aid in sediment deposition. A release point for runoff water is typically present and consists of an emergency overflow or regulating structure.

Used for this project? ☒ Yes ☐ No

Application Notes: Sediment basins will be installed prior to any other land disturbing activities that rely on basins for stormwater control. Embankment materials shall consist of soil free of debris. Organic material, and rocks or concrete greater than 3-inches diameter and shall have a minimum of 15% by weight passing a No. 200 sieve. Embankment materials must be compacted to at least 95% of maximum density.

- *Vehicle Tracking Control:* VTC is used to limit off-site tracking of sediment from disturbed or unpaved areas to paved areas. VTC can include: TRM or mud mats installed at the point of access from unpaved areas (used when traffic is limited or light), a 1.5-inch diameter rock gravel access pad combined with pavement sweeping (used when traffic is limited or light), or a 3+-inch rock with geotextile underlayment combined with street sweeping (used for heavy construction traffic or at the main access point to a development site).

Used for this project? ☒ Yes ☐ No

Application Notes: VTC Entrances to disturbed areas will be constructed *before* clearing and grading begins.

2.2 Non-Structural BMPs

Non-structural BMPs are implemented at the site to minimize erosion and sediment transport and may include temporary or permanent vegetation, mulching, landscaping, geotextiles, sod stabilization, surface roughening, vegetative buffer strips (VBS), and protection/preservation of trees and other mature vegetation. The non-structural BMPs outlined below are general definitions and guidelines. Project-specific specifications for selected BMPs are detailed in the SWMP Drawings included in the Attachments.

- *Temporary and permanent seeding:* Seeding of disturbed areas provides soil stabilization and helps prevent erosion and sediment transport. Seeding is usually performed by ripping the

area, spreading the appropriate seed mix, and applying straw mulch at a rate of two tons per acre over the seeded area. In some cases, a tackifier may be used to anchor the straw mulch. Managing and applying the proper seed mix and following the specified maintenance procedures are very important in promoting timely growth of grasses while minimizing weed growth. This BMP is effective on slopes up to 3:1 and where soil conditions are adequate.

Used for this project? ☒ Yes ☐ No

Application Notes: A mixture developed for elevations 3,000 feet to 8,000 feet will provide natural cover under dryland conditions. Seed for this project will be broadcast spread at a rate of 20 to 25 pounds per acre or drilled at a rate of 15 to 20 pounds per acre. Overseeding will be broadcast spread at a rate of 10 to 15 pounds per acre or drilled at a rate of 5 to 10 pounds per acre. Seed mixture specifications are included in the attached SWMP Drawings. Seed will be mulched with weed-free straw mulch. Temporary seeding may be used on disturbed areas not planned for activity within 30 days. Top soil stock piles will be stabilized with temporary seed and mulch no later than fourteen days from the last construction activities in that area. Once construction activity ceases permanently in an area, the area will be stabilized with permanent seed and mulch. Permanent seeding will be used in designated Open Space areas. Soils that are stockpiled for more than 30 days shall be mulched and seeded with a temporary or permanent grass cover within 21 days of stockpile construction.

- *Mulching:* A layer of suitable mulch is typically applied at a rate of two tons per acre and can be tacked or fastened by an approved method suitable for the type of mulch used. Rough cut streets can be mulched in lieu of a layer of aggregate road base or asphalt paving. Seeding shall be placed in areas designated as being in an interim state.

Used for this project? ☒ Yes ☐ No

Application Notes: A layer of suitable mulch shall be applied at a rate of two tons per acre to all disturbed portions of the site within 21 days of the completion of grading. If the area is to remain in an interim state for more than 60 days, seeding BMPs shall be used. Mulch can be used in areas of rough cut streets unless a layer of road base or asphalt paving is planned within 21 days.

- *Landscaping:* Landscaping includes rock, mulch, sod, trees, bushes, geofabrics, hardscaping, etc. as identified in the final stabilization specifications. Landscaping may be done by the developer or by the property owner.

Used for this project? ☐ Yes ☒ No

Application Notes: Landscaping is planned for all disturbed areas that are not paved, hardscaped, or covered with permanent seeding.

- *Surface Roughening:* Surface roughening is the mechanical breaking up of soils as a short-term method of temporary stabilization in areas where temporary seeding is not practical or in

areas where active construction is ongoing. Surface roughening is achieved through ripping or tilling the surface to increase surface area and infiltration.

Used for this project? ☐ Yes ☒ No

Application Notes: Surface roughening using scarifying methods such as disking or dragging bucket teeth over areas of disturbed soils parallel to slope contours will be completed in areas of active construction.

- **Vegetative Buffer Strips:** VBS are areas of original vegetation kept in place during construction that are preserved and maintained to filter sediment deposited from sheet flow. Maintenance includes cleanup of sediment and re-vegetation of VBS as necessary. Maintaining vegetative buffers is important around sensitive areas such as wetlands, waterways, etc.

Used for this project? ☒ Yes ☐ No

Application Notes: Pre-existing vegetation shall be protected and maintained within 50 horizontal feet of waters of the State unless unfeasible.

2.3 Housekeeping BMPs

Housekeeping BMPs are maintenance practices implemented to keep the site clean, reduce potential chemical or biological exposures, and to minimize the tracking of soils to hard surfaces and airborne particles. Maintenance BMPs include street sweeping, dust suppression techniques, spill prevention and response (Section 1.13), waste management and disposal, and materials handling and management (Section 1.14). Project-specific specifications for selected BMPs are detailed in the SWMP Drawings included in the Attachments.

- **Street Sweeping:** Street sweeping is the practice of removing soil clumps, scraping packed dirt/mud, and sweeping loose soils tracked onto paved surfaces to prevent sediment transport in runoff water. Materials removed as part of this BMP should be deposited in an area contained by perimeter BMPs or disposed offsite.

Used for this project? ☒ Yes ☐ No

Application Notes: Street sweeping methods will be employed in areas of ingress/egress from paved areas to the construction site. Vehicle tracking of soils and construction debris off-site shall be minimized. Materials tracked offsite shall be cleaned up and properly disposed immediately. The owner, site developer, contractor, and their agents shall be responsible for the removal of dirt, rock, construction debris, trash, sediment, and sand that accumulates in public right of ways, storm sewers, or other drainage conveyance system and stormwater appurtenances.

- **Dust Suppression:** Dust suppression BMPs are typically used to minimize the transport of fine particles through the air. Dust suppression techniques may include keeping the site wet using water trucks or other wetting methods or covering of loose soils in disturbance areas. During

periods of high wind, the following activities should be monitored: limited street sweeping, restriction of major grading activities, restriction of soil stockpiling, controlling vehicular speed.

Used for this project? ☒ Yes ☐ No

Application Notes: A water source shall be available onsite during earthwork operations and utilized as required to minimize dust from earth working operations and wind.

- **Load Covering:** Trucks or other vehicles carrying cut or fill materials to or from the site should be covered to prevent accidental loss of material during transport onto public right of ways

Used for this project? ☒ Yes ☐ No

Application Notes: Loads of cut and fill must be properly covered.

- **Site Waste Management and Disposal:** Construction waste disposal and trash generated by onsite personnel should be collected in dumpsters or similar trash containers and emptied on a regular basis. Construction waste and trash should be kept in a secure area and lidded if required to avoid accidental spreading of waste. Trash containers should be kept on permeable surfaces within perimeter BMPs. Loose trash should be collected daily and disposal services should be on a regular schedule to avoid overfilling of containers. Hazardous materials may not be disposed in trash containers and no waste materials should be buried onsite.

Used for this project? ☒ Yes ☐ No

Application Notes: Trash at the site will be cleared daily and kept in secured and/or covered receptacles. Waste disposal will be managed through a licensed contractor.

- **Portable Toilet Facilities:** A proper amount of portable toilets should be located at the Project Site and should be kept within the perimeter BMPs on permeable surfaces. Portable toilets should be anchored to prevent tipping and should be at least five feet behind curbs and at least 50 feet from any storm sewer inlets. Toilets should also be kept away from preferential flow pathways and from all water bodies. Regularly scheduled maintenance should be in place to empty and clean the receptacles to prevent overflow and waste collecting.

Used for this project? ☒ Yes ☐ No

Application Notes: Portable toilets will be provided and maintained through a private contractor.

- **Concrete Washout:** Concrete washout areas typically consist of an unlined pit in the ground with a vehicle tracking control (VTC) entrance and are designed to capture and contain concrete washout water. In areas with a high groundwater table, poly-lined pits or a portable waste bin may be used. Pits should be placed to minimize the potential for pollutant discharge. Washout basin deposits (hardened concrete waste) should be removed and properly disposed offsite as solid waste on a regular basis after liquids have evaporated.

Used for this project? ☒ Yes ☐ No

Application Notes: Concrete wash water shall be contained and disposed in accordance with the SWMP. No concrete wash water shall be discharged to or allowed to runoff to State waters. Concrete washout areas shall not be located in an area where shallow groundwater may be present or within 50 feet of a surface water body. Unless confined to a predefined, bermed containment area, the cleaning of concrete truck delivery chutes is prohibited at the Project area.

2.4 Stormwater Management Plan Non-Applicable Items

SWMP Checklist Number	Description	Comments
12	Spill prevention and pollution controls for dedicated batch plants	Asphalt/concrete batch plants not proposed
14	Location and description of any anticipated allowable non-stormwater discharge (ground water, springs, irrigation, discharge covered by CDPHE Low Risk Guidance, etc.)	Non-stormwater discharge not anticipated
16	Description of all stream crossings located within the project area or statement that no streams cross the project area	No streams cross the project site area
17f	Location of any dedicated asphalt / concrete batch plants	Asphalt/concrete batch plants not proposed

3. FINAL STABILIZATION AND LONG-TERM STORMWATER MANAGEMENT

Once construction activity ceases permanently in an area, the area shall be stabilized with permanent landscaping and/or seed and mulch as designated below. Final stabilization is complete when all ground disturbing activities are complete and all disturbed areas have either a uniform vegetative cover with an individual plant density of 70% of pre-disturbance levels, permanent hardscaping or paving is in place, or an equivalent permanent alternative stabilization method is implemented. Once stabilization is complete, all temporary sediment and erosion control measures shall be removed.

Final Stabilization for this site will consist of a combination of temporary controls and permanent seeding:

- *Landscaping.* Disturbed areas around finished units that are not paved or otherwise hardscaped should be landscaped on completion of the vertical structure. Weather may delay landscaping which may be offset by temporary measures such as erosion control blankets, wattles, inlet protection, or other BMPs outlined in Section 2.

- *Paving/Hardscaping.* Areas not planned for landscaping should be paved or hardscaped including roadways, sidewalks, driveways, parking areas, etc.
- *Temporary controls.* Temporary erosion and sediment control measures should be maintained on un-stabilized areas. Disturbed areas should be surface-roughened and slopes steeper than 3:1 and graded swales should be covered with erosion control blankets. Temporary controls may be removed once stabilization is complete and the plant density reaches 70% pre-disturbance levels.
- *Permanent BMPs.* Permanent post-construction BMPs should remain onsite after construction activities have been completed and the site is stabilized. These BMPs may include detention facilities, swales, and natural depressions.
- This project will not require the use of control measures owned or operated by another entity.

3.1 Inspection and Maintenance

Visual inspections of all cleared and graded areas of the construction site will be performed on a minimum occurrence of once per week and/or within 24 hours of the end of any precipitation or snowmelt event that causes surface erosion. The inspection will be the responsibility of the Qualified Stormwater Manager. An inspection report form has been provided in the Attachments. The inspection will verify that the structural BMPs described in Section 2.1 of this SWMP are functioning properly, in good condition, up to date and continue to minimize erosion. The inspection will also verify that the procedures used to prevent stormwater contamination from construction materials and petroleum products are effective. The following inspection and maintenance practices will be used to maintain erosion and sediment controls:

- Accumulated sediment and debris shall be removed from a BMP when the sediment/debris level reaches one half the height of the BMP or at any time that sediment or debris adversely impacts the functioning BMP.
- Built up sediment will be removed from silt fencing when it has reached one-third the height of the fence.
- Silt fences will be inspected for depth of sediment, for tears, to see if the fabric is securely attached to the fence posts, and to see that the fence posts are firmly in the ground.
- Sediment basins will be inspected for depth of sediment and built up sediment will be removed when it reaches 1 foot in depth.
- Temporary and permanent seeding will be inspected AND noted for bare spots, washouts, and healthy growth.
- The stabilized construction entrances will be inspected for sediment tracked on the road, for clean gravel, and to make sure that all traffic uses the stabilized entrance when leaving the site.

- The maintenance inspection report will be made after each inspection. A copy of the report form to be completed by the Qualified Stormwater Manager is provided in the Attachments. Completed forms will be maintained on-site during the entire construction project. Following construction and the expiration or inactivation of the permit, the completed forms will be retained at the general contractor's office, for a minimum of 3 years.
- If construction activities or design modifications are made to the site plan which could impact stormwater, this SWMP will be amended appropriately. The amended SWMP will have a description of the new activities that contribute to the increased pollutant loading and the planned source control activities.

3.2 BMP Replacement and Failed BMPs

At a minimum, the contractor shall inspect and keep a log of all BMPs on a weekly basis and after a significant precipitation event. BMPs should be assessed by a qualified inspector to determine if new or replacement BMPs are necessary. Where BMPs have failed, the failure must be addressed as soon as possible to minimize discharge of additional pollutants. As new BMPs are installed and/or replaced, this SWMP should be updated to reflect the change(s).

3.3 Qualified Inspectors

Qualified inspectors should be knowledgeable in the principals and practices of erosion and sediment control and should have a good working knowledge of the regulation and BMPs included in this SWMP. Inspectors should also be able to anticipate site conditions and assess BMP functionality that could impact stormwater runoff.

3.4 Additional SWMP and BMP Practices

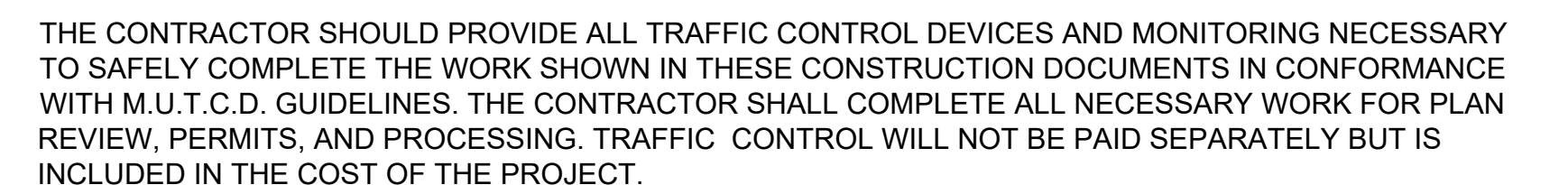
An employee training program should be developed and implemented to educate employees about the requirements of the SWMP. This education program will include background on the components and goals of the SWMP and hands-on training in erosion controls, spill prevention and response, good housekeeping, proper material handling, disposal and control of waste, equipment fueling, and proper storage, washing, and inspection procedures.

This plan was prepared in accordance with the CDPS General Permit. A copy of this permit is provided in the Attachments.



Attachments

SWMP Drawings

THIS FINAL GRADING AND EROSION CONTROL PLAN IS AN ACCURATE REPRESENTATION OF THE GENERAL DRAINAGE PATTERNS ON THE SITE, BUT IS NOT A COMPREHENSIVE DETAILED GRADING PLAN THAT ADDRESSES ALL CONDITIONS THAT MAY OCCUR. THE GRADING OF EACH LOT SHOULD BE CHECKED BY THE HOMEBUILDER TO ENSURE THAT DRAINAGE WILL NOT BE COMPROMISED ON THE LOT OR THE ADJACENT LOTS. CONTRACTOR TO CONTACT DESIGN ENGINEER IF FIELD CONDITIONS DIFFER FROM WHAT IS SHOWN WITHIN THESE PLANS.



OWNER/DEVELOPER	SYLVAN VISTA, INC. 14160 GLENEAGLE DRIVE COLORADO SPRINGS, CO 80921
CIVIL ENGINEER	MATRIX DESIGN GROUP 2435 RESEARCH PARKWAY, SUITE 300 COLORADO SPRINGS, CO 80920
ELECTRIC	MOUNTAINVIEW ELECTRIC ASSOCIATION (719) 495-2283
GAS	BLACK HILLS ENERGY 105 SOUTH VICTORIA AVENUE PUEBLO, CO (888) 890-5554
STREET	EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT INSPECTIONS 2880 INTERNATIONAL CIRCLE, SUITE 110 COLORADO SPRINGS, CO 80910 (719) 520-6819
DRAINAGE	EL PASO COUNTY DEPARTMENT OF PUBLIC WORKS STORMWATER TEAM 3275 AKERS DRIVE COLORADO SPRINGS, CO 80922 (719) 520-6877
FIRE DEPARTMENT	TRI-LAKES MONUMENT FIRE RESCUE 16055 OLD FOREST POINT, SUITE 103 MONUMENT, CO 80132 (719) 484-0911

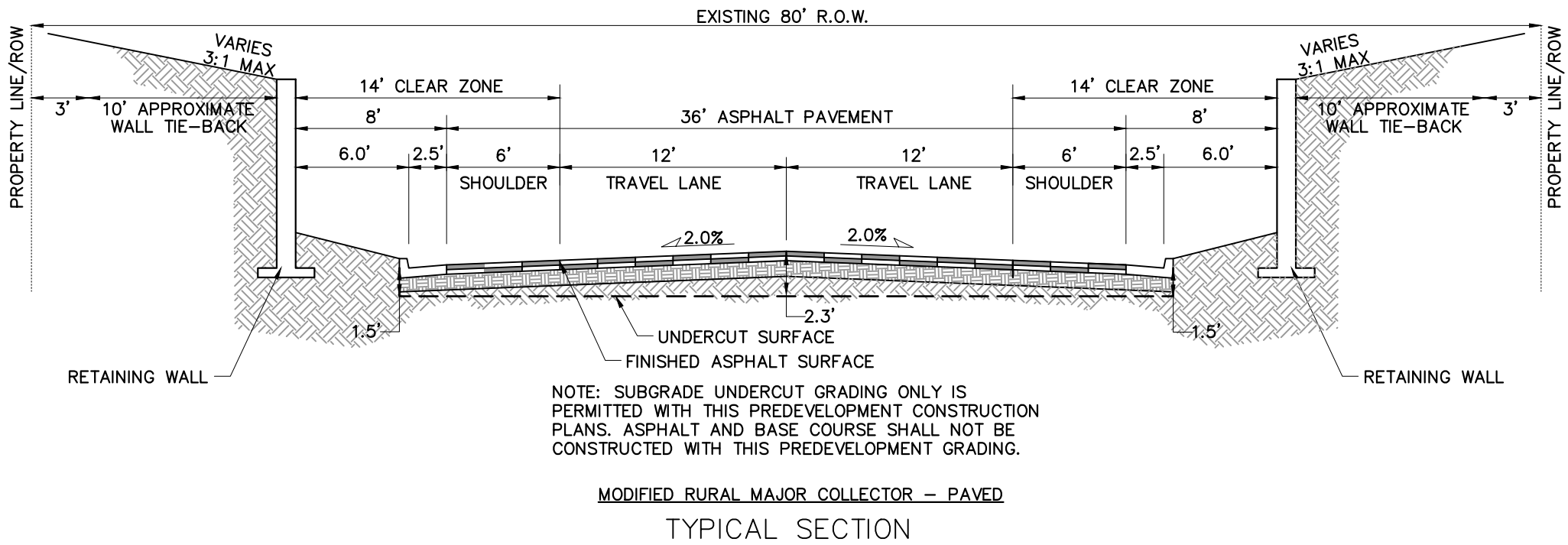
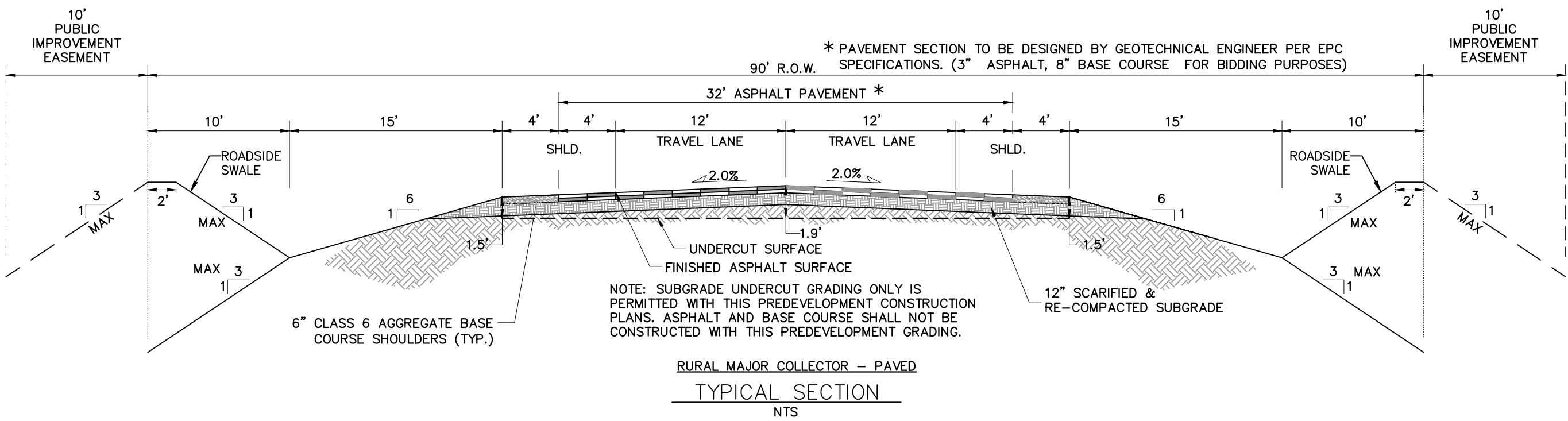
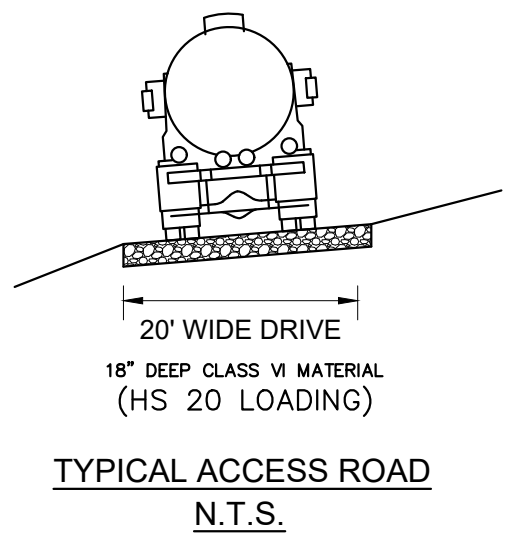
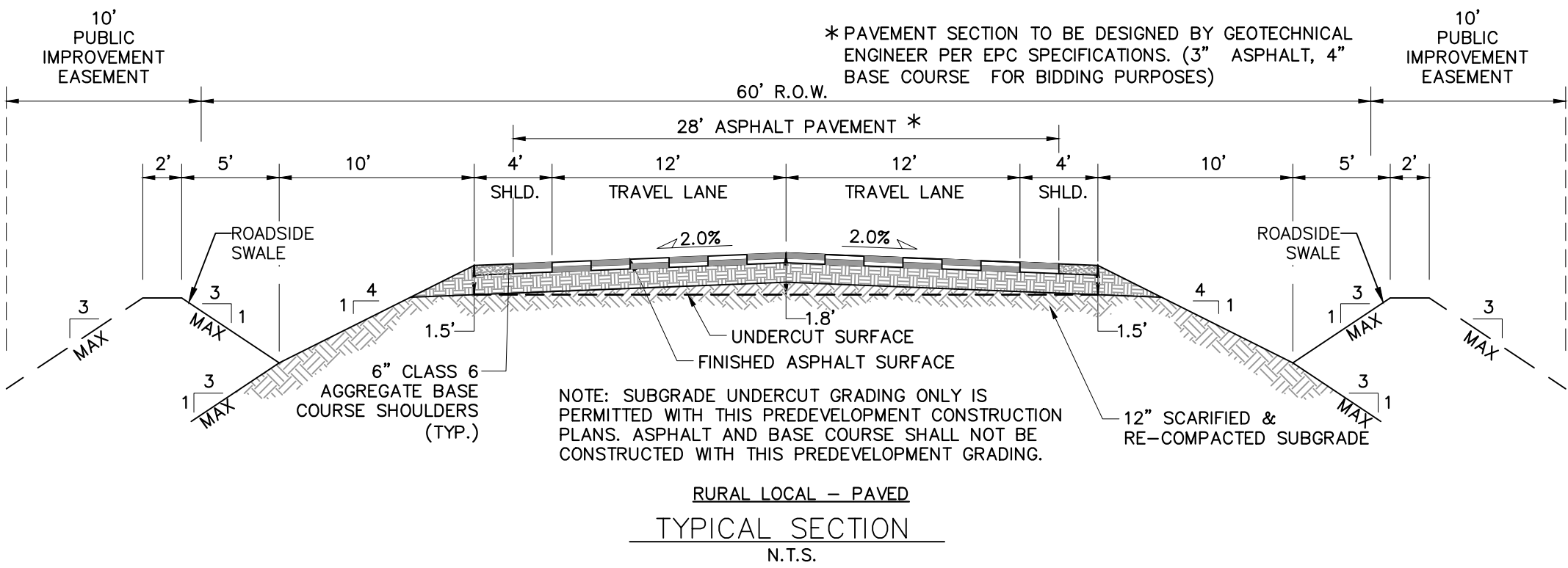
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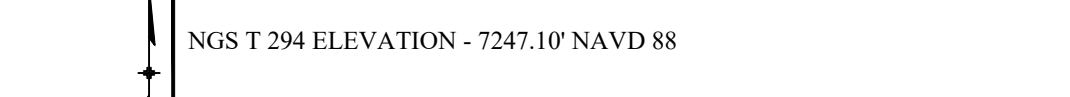

ABBREVIATIONS

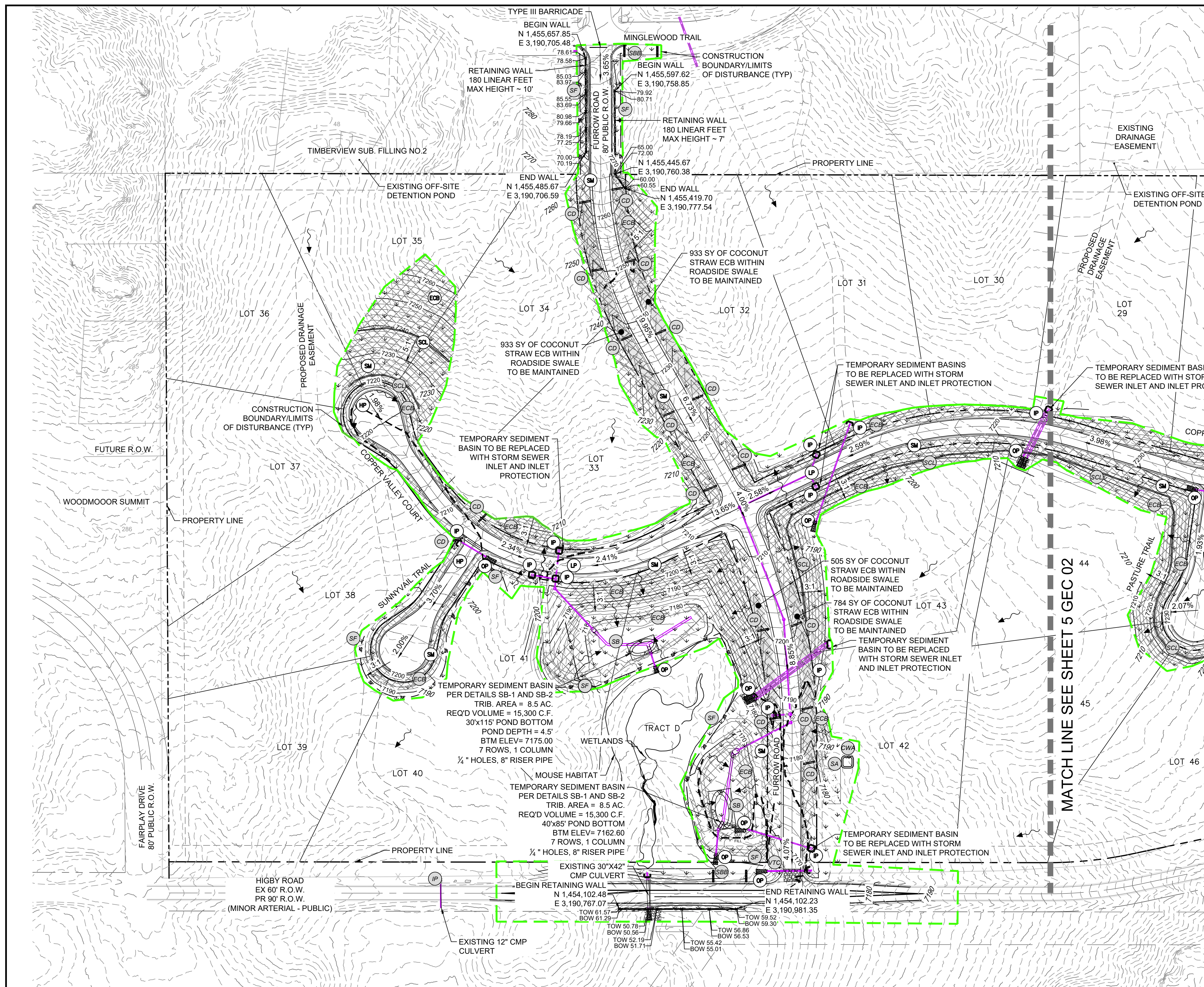
ASSY	ASSEMBLY	MAX	MAXIMUM
ASTM	AMERICAN SOCIETY OF TESTING AND MATERIALS	MH	MANHOLE
APPROX	APPROXIMATE or APPROXIMATELY	MIN	MINIMUM
AVE	AVENUE	MJ	MECHANICAL JOINT
AVG	AVERAGE	NTS	NOT TO SCALE
BLVD	BOULEVARD	O/S	OFFSET
BTM	BOTTOM	PR	PROPOSED
CDOT	COLORADO DEPARTMENT OF TRANSPORTATION	PC	POINT OF CURVATURE
CEN	CENTER	PCC	POINT OF COMPOUND CURVE
C or CL	CENTERLINE	PCR	POINT OF CURB RETURN
CFS	CUBIC FEET PER SECOND	R _c or P/L	PROPERTY LINE
CONC	CONCRETE	PRC	POINT OF REVERSE CURVE
CONST	CONSTRUCTION	PT	POINT OF TANGENCY
CONT	CONTINUOUS	PVC	POINT OF VERTICAL CURVE or POLYVINYL CHLORIDE
DIA	DIAMETER	PVI	POINT OF VERTICAL INTERSECTION
DWG	DRAWING	PVMT	PAVEMENT
EA	EACH	PVT	POINT OF VERTICAL TANGENT
EGL	ENERGY GRADE LINE	RCP	REINFORCED CONCRETE PIPE
ELEV or EL	ELEVATION	RED	REDUCER
ESMT	EASEMENT	REF	REFERENCE
EX or EXIST	EXISTING	REQ	REQUIRED
FES	FLARED END SECTION	REV	REVISION
F or FL	FLOWLINE	ROW	RIGHT-OF-WAY
FLG	FLANGE	RT	RIGHT
FT	FOOT/FEET	SD	STORM SEWER
HGL	HYDRAULIC GRADE LINE	ST	STREET
HP	HIGH POINT	STA	STATION
HORIZ	HORIZONTAL	STD	STANDARD
HCL	HORIZONTAL CONTROL LINE	SS	SANITARY SEWER
INV	INVERT	SW or S/W	SIDEWALK
	VERTICAL CURVE FACTOR	TAN	TANGENT
LF	LINEAR FEET	TBC	TOP BACK OF CURB
LN	LANE	TYP	TYPICAL
LP	LOW POINT	UG	UNDERGROUND
LT	LEFT	UTIL	UTILITY
		VERT	VERTICAL
		W	WIDTH
		w/	WITH













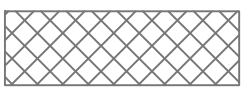

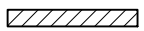



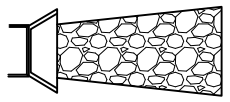

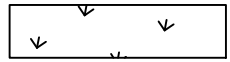

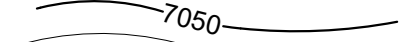
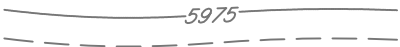
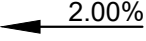
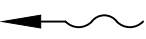




SYMBOLS

	PROPOSED CENTERLINE
	EXISTING PAVED ROAD
	EXISTING UNDERGROUND UTILITY
	PROPOSED UNDERGROUND UTILITY
	RIGHT OF WAY
	EASEMENT
	EXISTING CURB & GUTTER
	PROPOSED CURB & GUTTER
	EXISTING CONTOUR
	PROPOSED CONTOUR
	LIMITS OF CONSTRUCTION



REFERENCE DRAWINGS X-Title-W-Final X-1105-EX SITE DESIGN	###	###	###	###	SHEET KEY BENCHMARK NGS T 294 ELEVATION - 7247.10' NAVD 88 BASIS OF BEARING: A LINE THAT IS 20' NORTH OF AND PARALLEL WITH THE EAST-WEST CETNER LINE OF SECTION 19, T11S, R66W, N89°56'32"W - 5135.84'. THE DIRECTION IS A GRID BEARING OF THE COLORADO STATION PLANE COORDINATE SYSTEM, CENTRAL ZONE, N.A.D. 1983. THE LINE IS MONUMENTED BY 5/8" DIAMETER REBAR, 18" IN LENGTH WITH 1-1/2" ALUMINUM CAPS "LWA PLS 28658"		OWNER: SYLVAN VISTA, INC. WILLIAM F. HEREBIC II, MANAGER 14160 GLENEAGLE DRIVE COLORADO SPRINGS, CO 80921 PREPARED BY: 	SEAL	GRANDWOOD RANCH			
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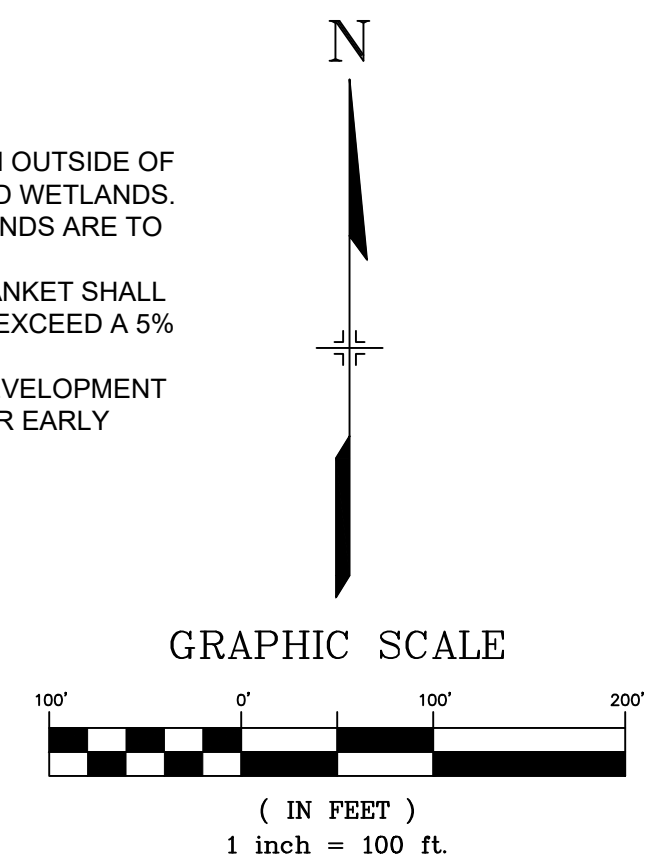


- | | | | | | |
|---|---|---|---|---|---|
|  |  |  |  |  | EXISTING BMP INSTALLED DURING
PR-DEVELOPMENT GRADING AND
EROSION CONTROL PLAN |
|  |  |  |  |  | |
| | |  |  | | HIGH POINT/LOW POINT |
| |  |  | | | EROSION CONTROL
BLANKET |
| |  |  | | | SEDIMENT CONTROL LOG |
| |  |  | | | INLET PROTECTION |
| |  |  | | | OUTLET PROTECTION |
| |  |  | | | SEEDING AND MULCHING |
| |  | | | | PROPOSED CONTOURS |
| |  | | | | EXISTING CONTOURS |
| |  | | | | SLOPE DIRECTION |
| |  | | | | DRAINAGE FLOW DIRECTION |
| |  | | | | 100-YR FLOODPLAIN |
| |  | | | | PROPERTY LINE |
| |  | | | | PROPERTY BOUNDARY |
| |  | | | | CONSTRUCTION BOUNDARY LINE /
LIMITS OF DISTURBANCE |

BMP SEQUENCING	
INITIAL	SILT FENCE, CONCRETE WASHOUT, VEHICLE TRACKING, TEMP SEDIMENT BASINS, INLET/OUTLET PROTECTION
INTERIM	CHECK DAMS, CONCNETE WASHOUT, STRAW BARRIERS, STOCKPILES, STAGING
FINAL	EROSION CONTROL BLANKETS, SEEDING & MULCHING



CONSTRUCTION NOTES :

1. ALL GRADING OPERATIONS SHALL REMAIN OUTSIDE OF DESIGNATED PREBLE MOUSE HABITAT AND WETLANDS. DESIGNATED MOUSE HABITAT AND WETLANDS ARE TO REMAIN UNDISTURBED.
2. COCONUT STRAW EROSION CONTROL BLANKET SHALL BE USED IN ALL ROADSIDE SVALES THAT EXCEED A 5% GRADE ADJUDICIAL.
3. REFERENCE GRANDWOOD RANCH PRE-DEVELOPMENT GRADING & EROSION CONTROL PLANS FOR EARLY OVERLOT GRADING BMP'S.



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SHEET KEY



BENCHMARK

NGS T 294 ELEVATION - 7247.10' NAVD 88

BASIS OF BEARING:

A LINE THAT IS 20' NORTH OF AND PARALLEL WITH THE EAST-WEST CENETRA LINE OF SECTION 19, T11S, R66W, N89°56:32"W - 5135.84'. THE DIRECTION IS A GRID BEARING OF THE COLORADO STATION PLANE COORDINATE SYSTEM, CENTRAL ZONE, N.A.D. 1983. THE LINE IS MONUMENTED BY 5/8" DIAMETER REBAR, 18" IN LENGTH WITH 1-1/2" ALUMINUM CAPS "LWA PLS 28658"

OWNER:
SYLVAN VISTA, INC.
WILLIAM F. HEREBIC II, MANAGER
14160 GLENEAGLE DRIVE
COLORADO SPRINGS, CO 80921

PREPARED BY:



Matrix

SEAL

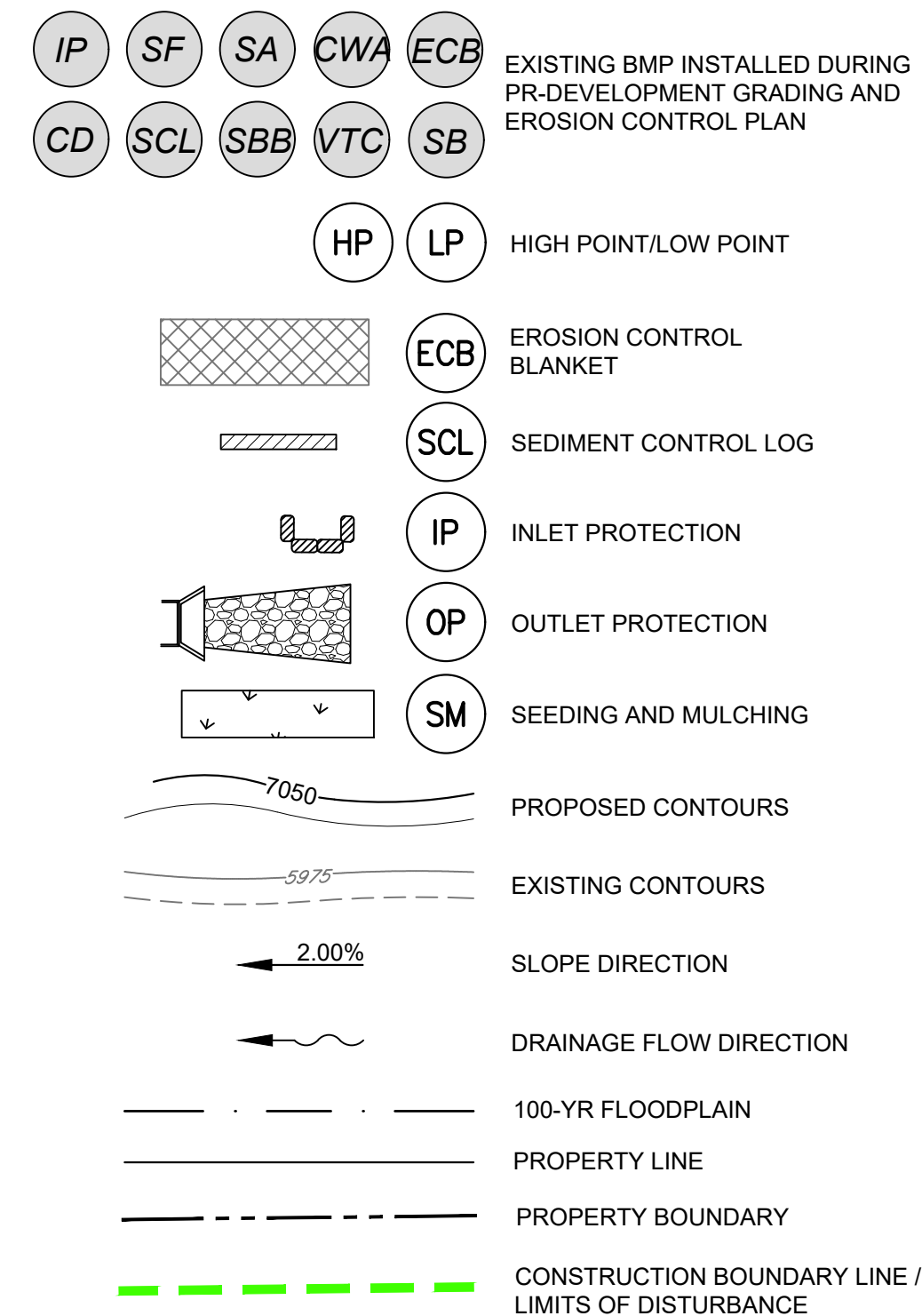
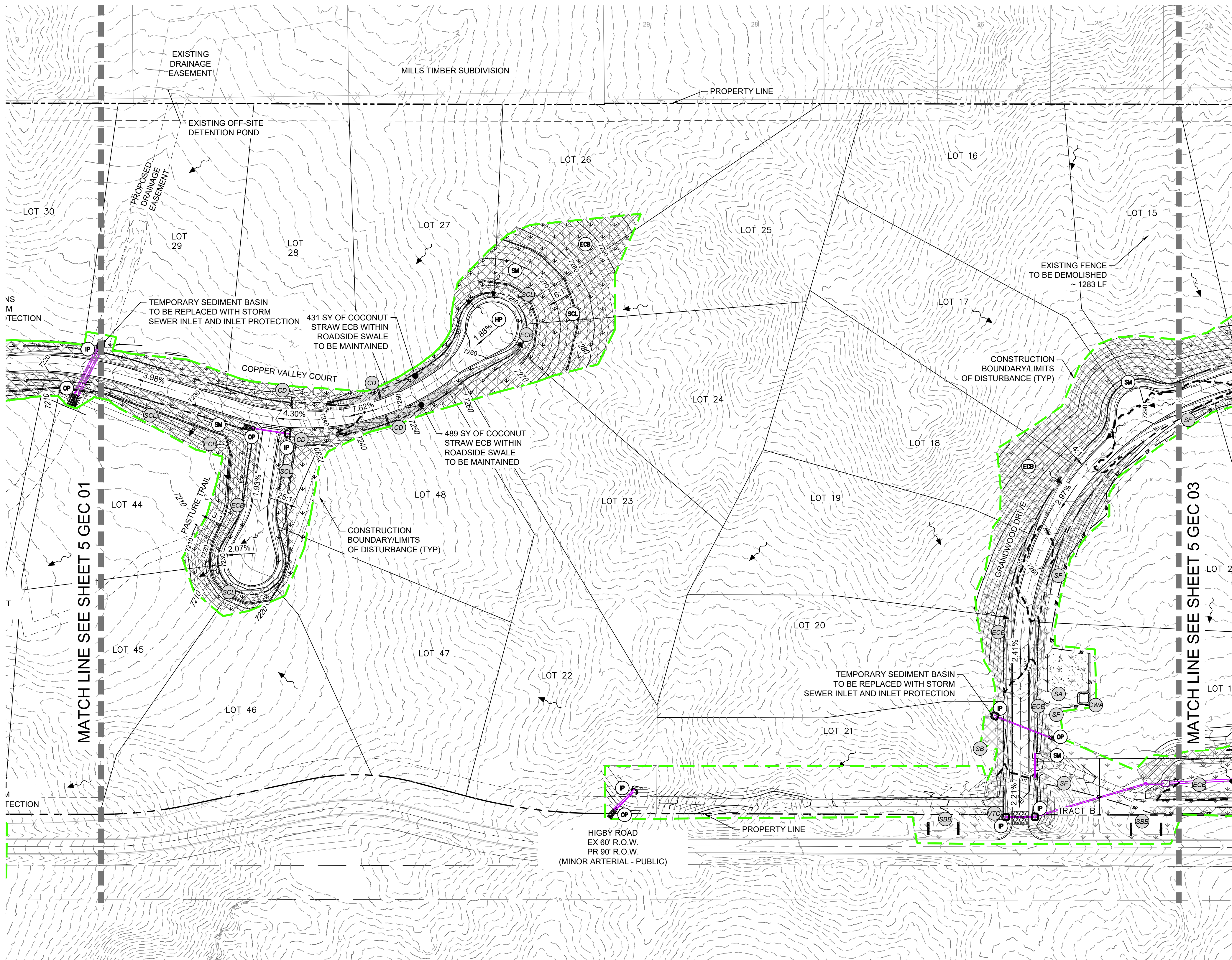
FOR AND ON BEHALF OF
MATRIX DESIGN GROUP, INC.
PROJECT No. 20.1105.004

<h1>GRANDWOOD RANCH</h1>				
<h2>EL PASO COUNTY FINAL GRADING & EROSION CONTROL PLANS</h2>				
<h3>GRADING & EROSION CONTROL PLAN</h3>				
DESIGNED BY:	CP	SCALE	DATE ISSUED:	SEPTEMBER, 2020
DRAWN BY:	TS	HORIZ. 1"=100'		
CHECKED BY:	NS	VERT. N/A	SHEET	4 OF 9
				DRAWING No. GEC01



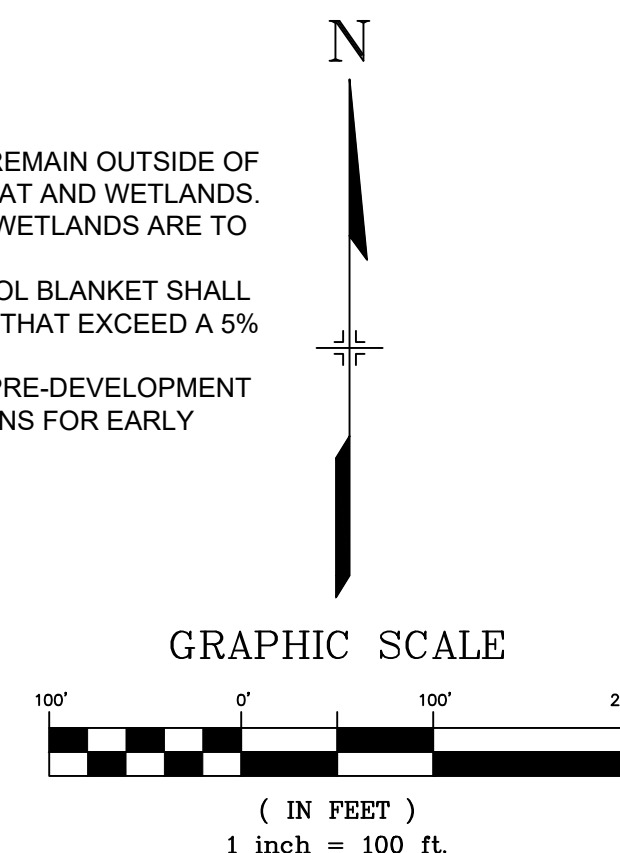
Know what's below.
Call before you dig.

5



BMP SEQUENCING	
INITIAL	SILT FENCE, CONCRETE WASHOUT, VEHICLE TRACKING, TEMP SEDIMENT BASINS, INLET/OUTLET PROTECTION
INTERIM	CHECK DAMS, COCONUT WASHOUT, STRAW BARRIERS, STOCKPILES, STAGING
FINAL	EROSION CONTROL BLANKETS, SEEDING & MULCHING

- CONSTRUCTION NOTES :
- ALL GRADING OPERATIONS SHALL REMAIN OUTSIDE OF DESIGNATED PREBLE MOUSE HABITAT AND WETLANDS. DESIGNATED MOUSE HABITAT AND WETLANDS ARE TO REMAIN UNDISTURBED.
 - COCONUT STRAW EROSION CONTROL BLANKET SHALL BE USED IN ALL ROADSIDE SWALES THAT EXCEED A 5% LONGITUDINAL SLOPE.
 - REFERENCE GRANDWOOD RANCH PRE-DEVELOPMENT GRADING & EROSION CONTROL PLANS FOR EARLY OVERLOT GRADING BMP'S.



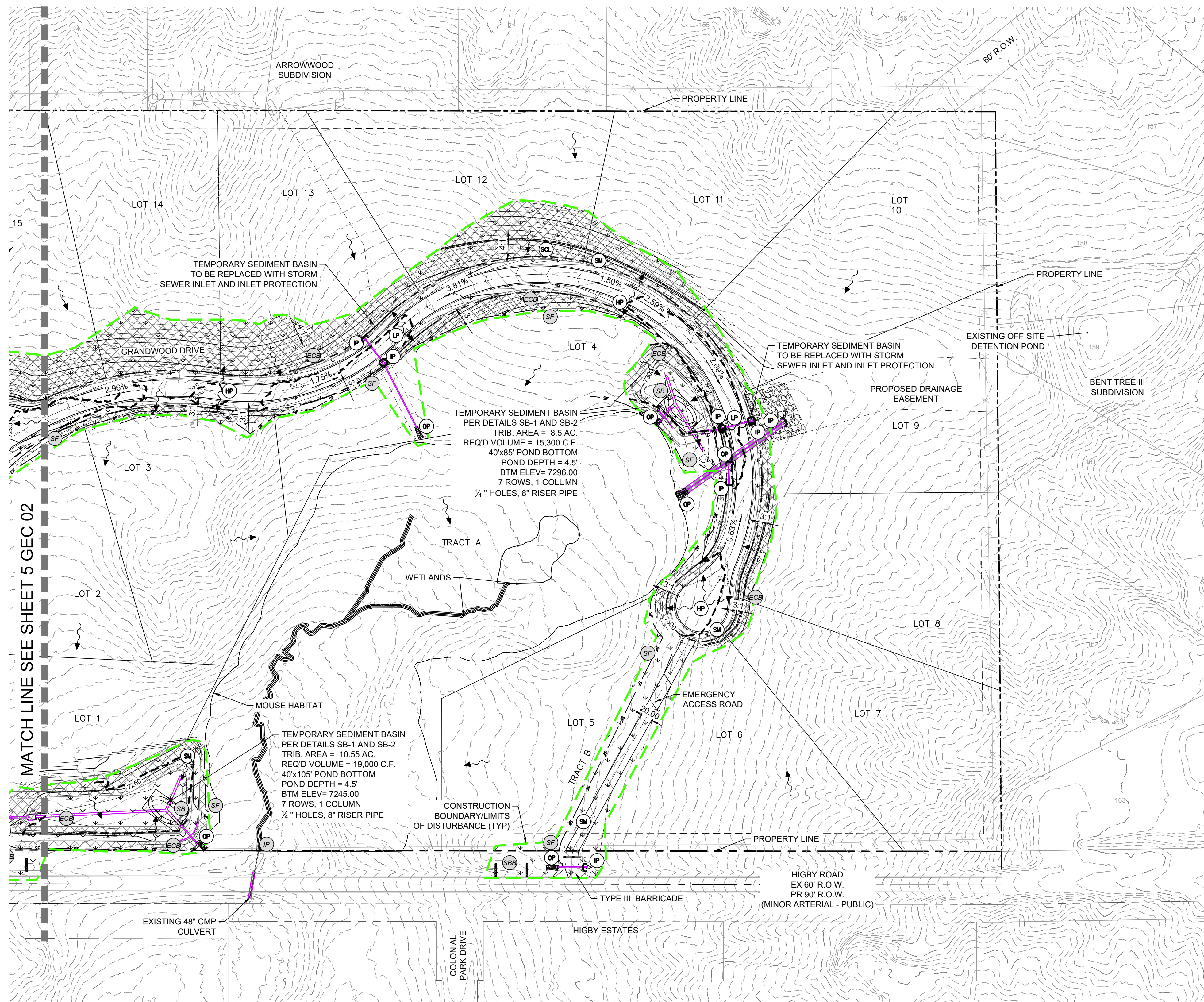
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BENCHMARK	
NGS T 294 ELEVATION - 7247.10' NAVD 88	
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OWNER: SYLVAN VISTA, INC. WILLIAM F. HEREBIC II, MANAGER 14160 GLENEAGLE DRIVE COLORADO SPRINGS, CO 80921
PREPARED BY:

SEAL	FOR AND ON BEHALF OF MATRIX DESIGN GROUP, INC. PROJECT No. 20.1105.004
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GRANDWOOD RANCH	
EL PASO COUNTY FINAL GRADING & EROSION CONTROL PLANS	
GRADING & EROSION CONTROL PLAN	
DESIGNED BY: CP DRAWN BY: TS CHECKED BY: NS	SCALE HORIZ 1" = 100' VERT. N/A
DATE ISSUED: SEPTEMBER, 2020 SHEET 5 OF 9	DRAWING No. GEC02



EXISTING BMP INSTALLED DURING
PR-DEVELOPMENT GRADING AND
EROSION CONTROL PLAN

HP LP HIGH POINT/LOW POINT

ECB EROSION CONTROL
BLANKET

SCL SEDIMENT CONTROL LOG

IP INLET PROTECTION

OP OUTLET PROTECTION

SM SEEDING AND MULCHING

7050 PROPOSED CONTOURS

5975 EXISTING CONTOURS

2.00% SLOPE DIRECTION

DRAINAGE FLOW DIRECTION

100-YR FLOODPLAIN

PROPERTY LINE

PROPERTY BOUNDARY

CONSTRUCTION BOUNDARY LINE /
LIMITS OF DISTURBANCE

BMP SEQUENCING	
INITIAL	SILT FENCE, CONCRETE WASHOUT, VEHICLE TRACKING, TEMP SEDIMENT BASINS, INLET/OUTLET PROTECTION
INTERIM	CHECK DAMS, COCONUT WASHOUT, STRAW BARRIERS, STOCKPILES, STAGING
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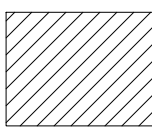
GRAPHIC SCALE



(IN FEET)
1 inch = 100 ft.

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SHEET KEY



BENCHMARK

NGS T 294 ELEVATION - 7247.10' NAVD 88

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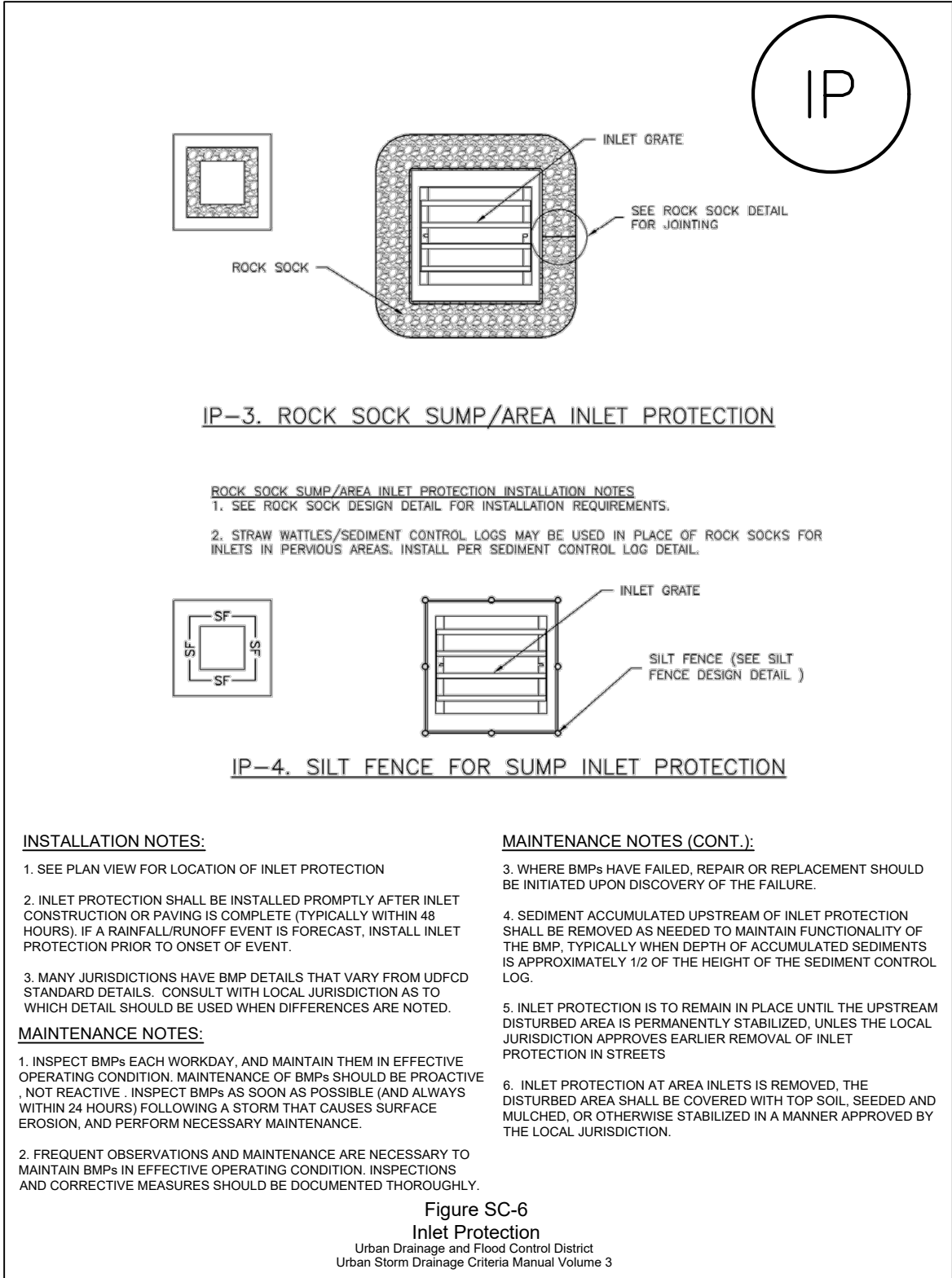
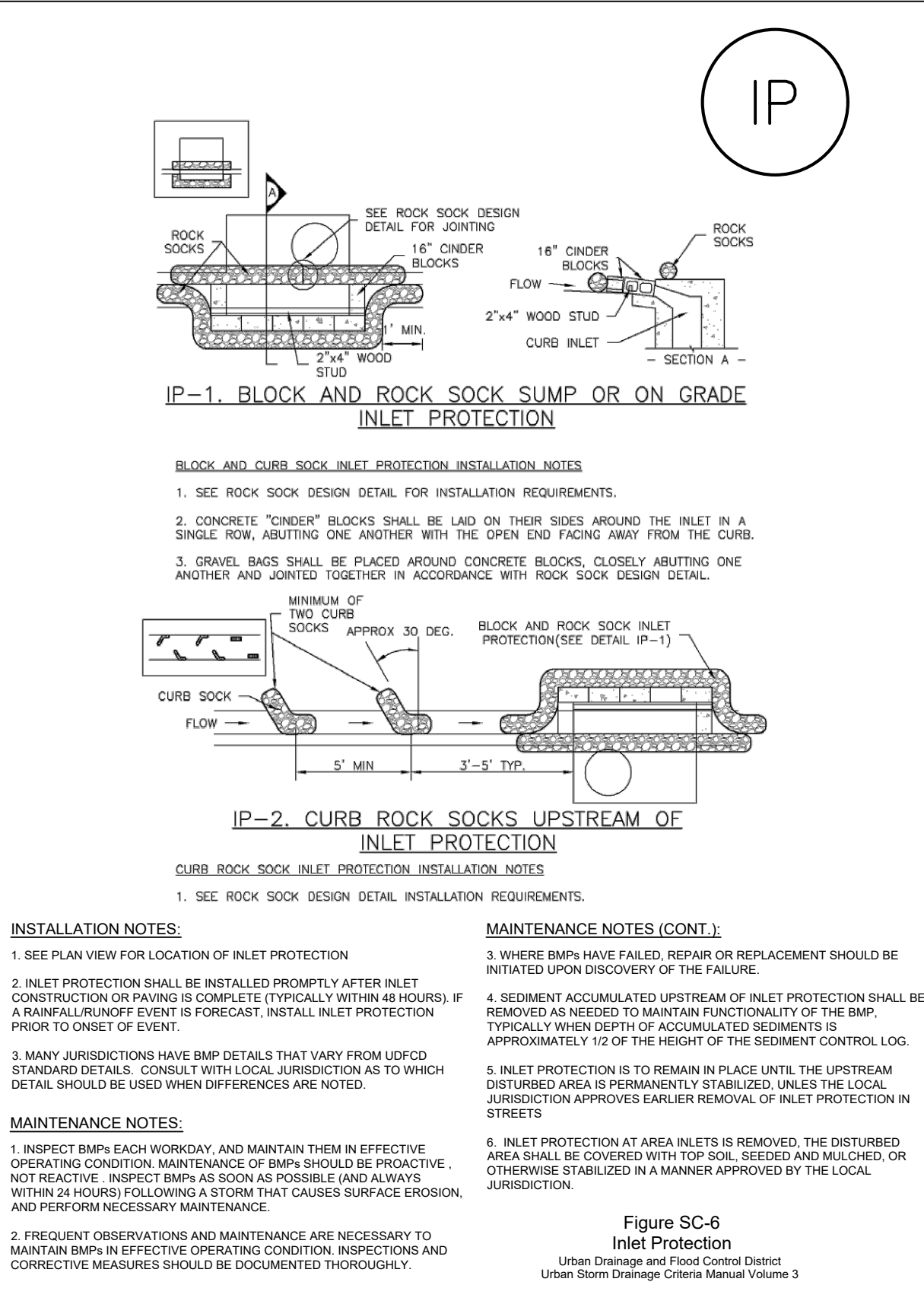
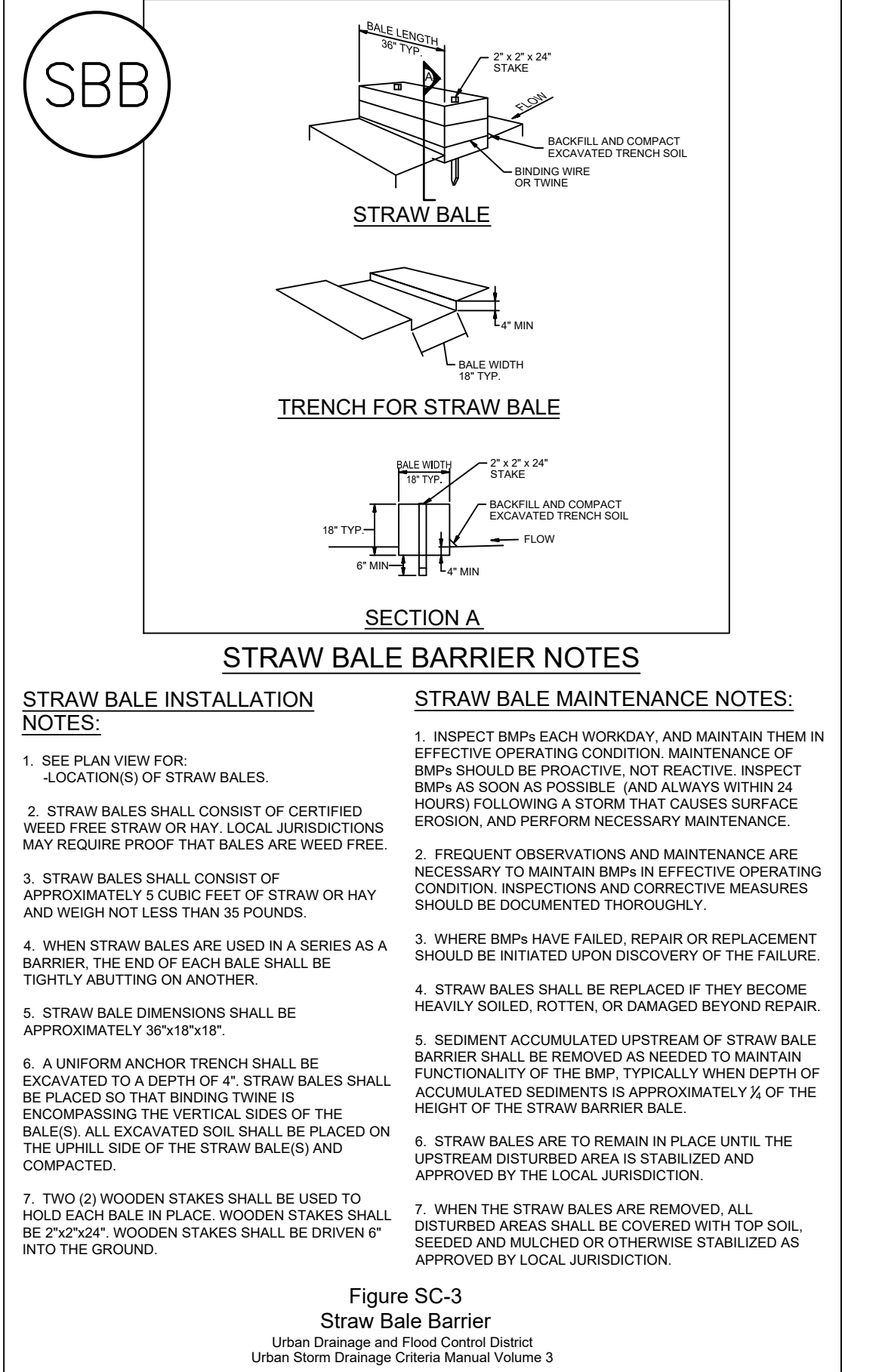
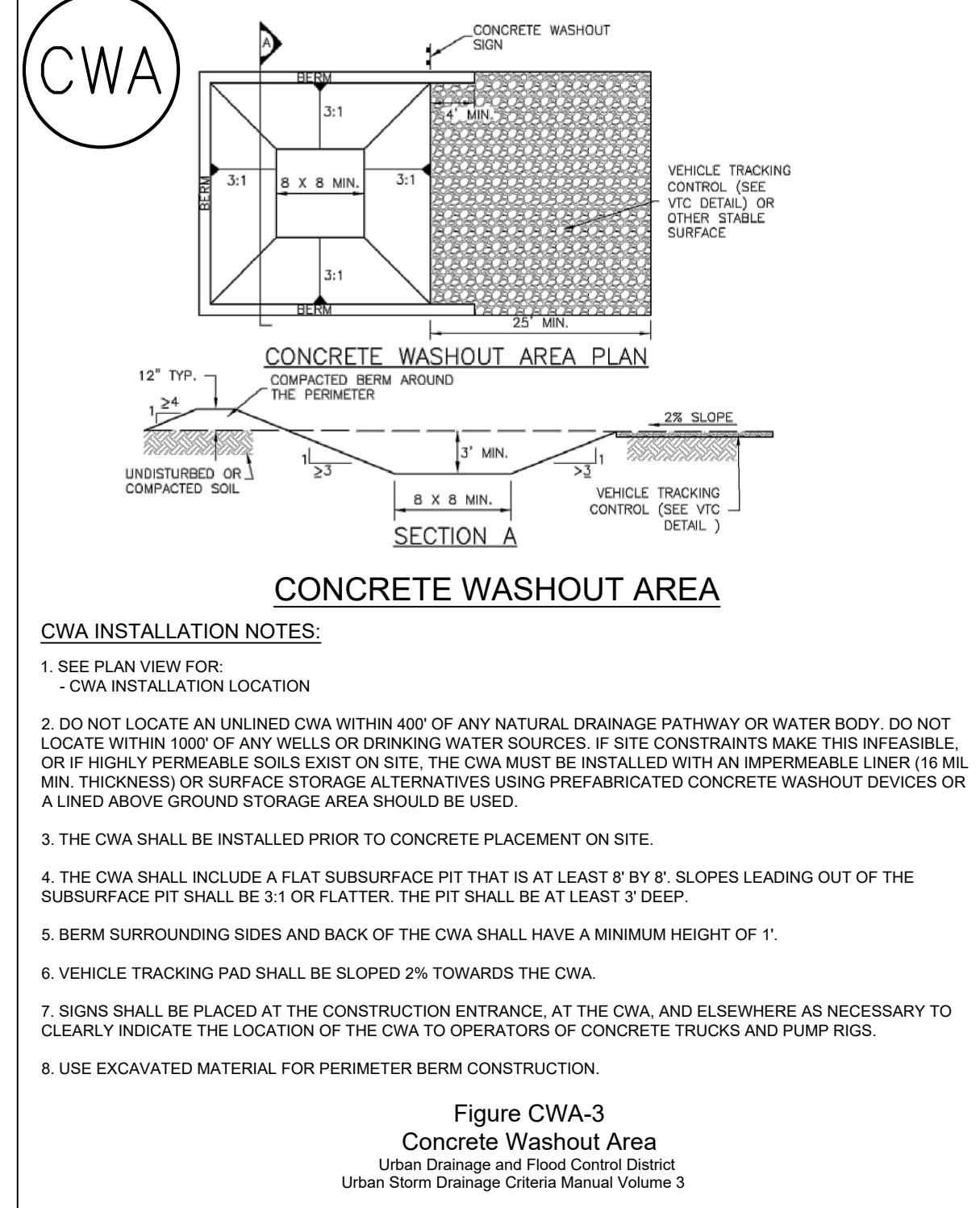
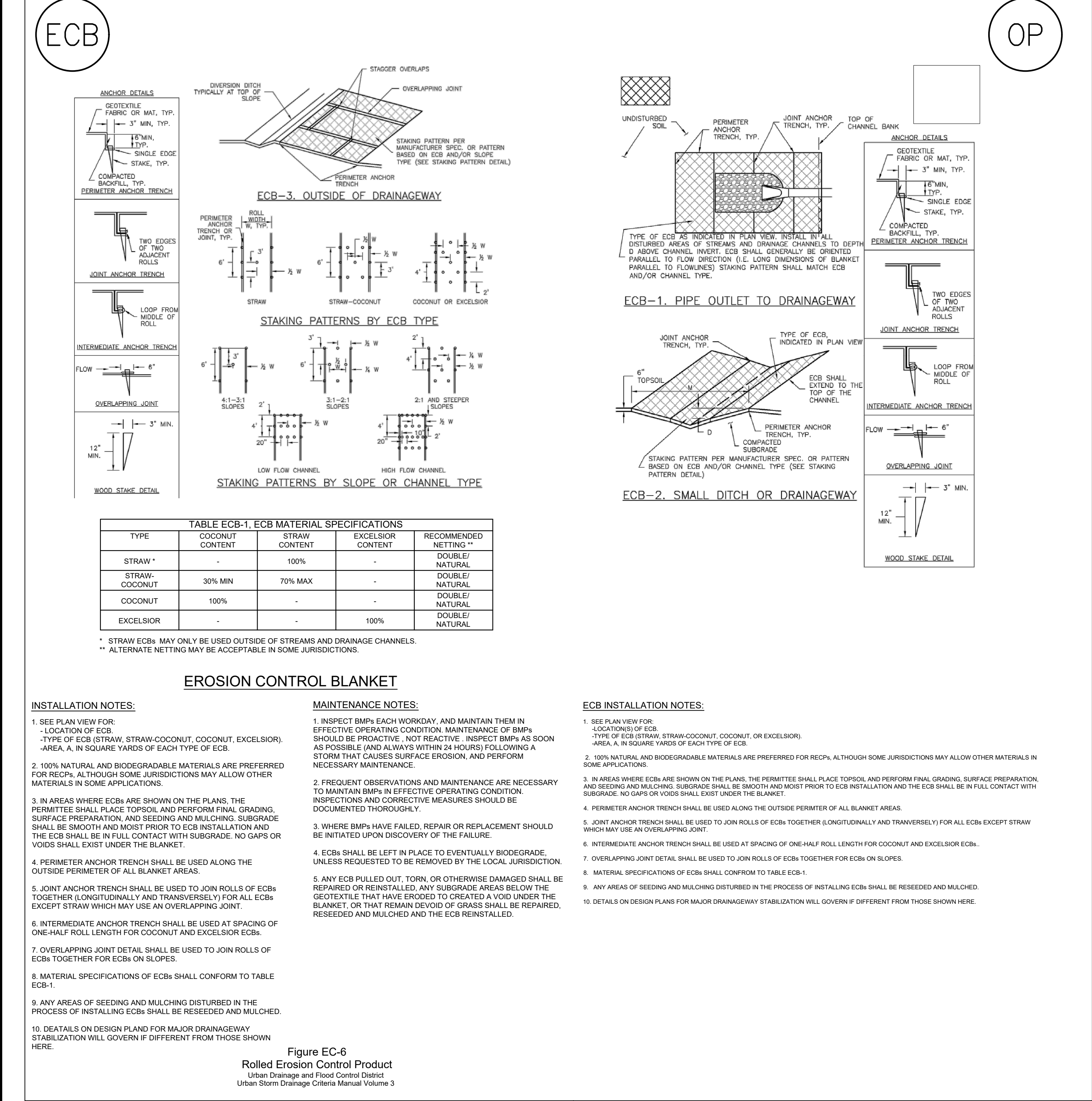
PREPARED BY:

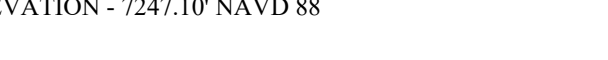



SEAL

FOR AND ON BEHALF OF
MATRIX DESIGN GROUP, INC.
PROJECT No. 20.1105.004

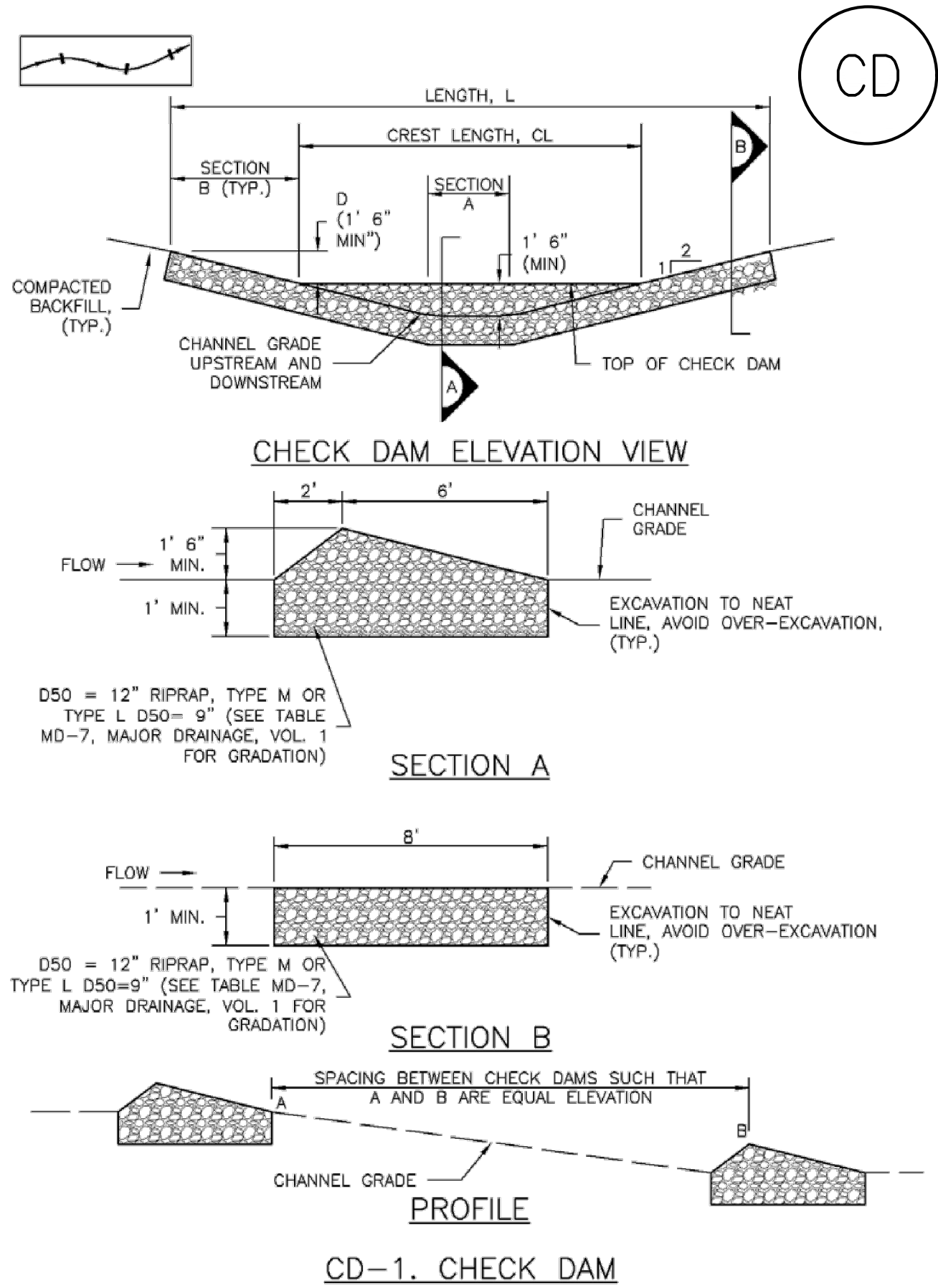
GRANDWOOD RANCH			
EL PASO COUNTY FINAL GRADING & EROSION CONTROL PLANS			
GRADING & EROSION CONTROL PLAN			
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DRAWN BY:	TS	HORIZ 1" = 100'	DRAWING No. GEC03
CHECKED BY:	NS	VERT. N/A	SHEET 6 OF 9



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OWNER: SYLVAN VISTA, INC. WILLIAM F. HEREBIC II, MANAGER 14160 GLENEAGLE DRIVE COLORADO SPRINGS, CO 80921				
PREPARED BY:				
SEAL				
FOR AND ON BEHALF OF MATRIX DESIGN GROUP, INC. PROJECT No. 20.1105.004				
				
DESIGNED BY: CP SCALE DATE ISSUED: SEPTEMBER, 2020 DRAWING No.				
DRAWN BY: TS HORIZ. N/A SHEET 8 OF 9 ECD02				
CHECKED BY: NS VERT. N/A				

Check Dams (CD)

EC-12



CHECK DAM INSTALLATION NOTES

- SEE PLAN VIEW FOR:
 - LOCATION 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 SWMP SHALL BE INSTALLED AFTER CONSTRUCTION FENCE, BUT PRIOR TO ANY UPSTREAM LAND DISTURBING ACTIVITIES.
- RIPRAP UTILIZED FOR CHECK DAMS SHOULD BE OF APPROPRIATE SIZE FOR THE APPLICATION. TYPICAL TYPES OF RIPRAP USED FOR CHECK DAMS ARE TYPE M (D50 12") OR TYPE L (D50 9").
- RIPRAP PAD SHALL BE TRENCHED INTO THE GROUND A MINIMUM OF 1'.
- THE ENDS OF THE CHECK DAM SHALL BE A MINIMUM OF 1' 6" HIGHER THAN THE CENTER OF THE CHECK DAM.

CHECK DAM MAINTENANCE NOTES

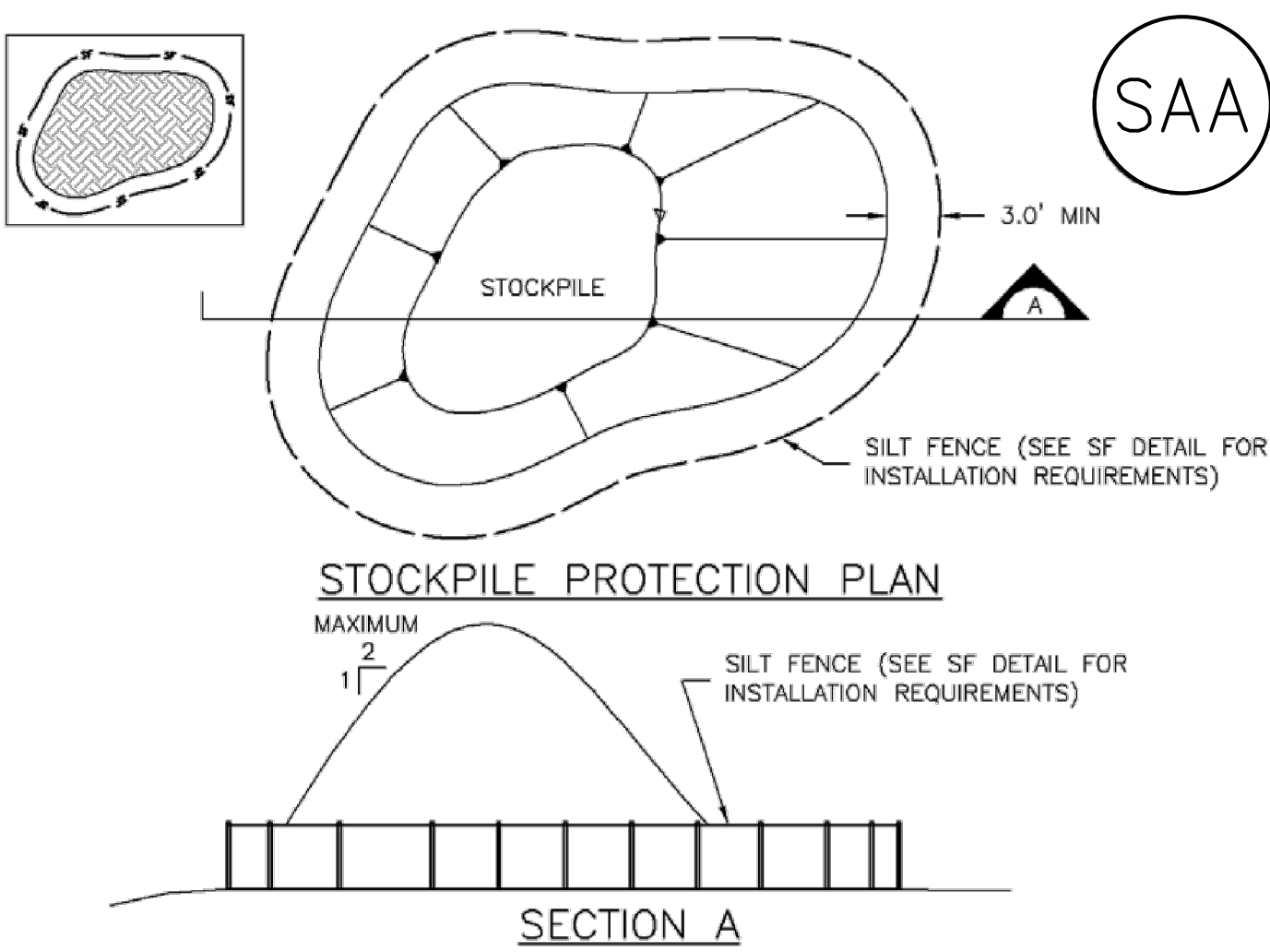
- INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.
- FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
- WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.
- SEDIMENT ACCUMULATED UPSTREAM OF THE CHECK DAMS SHALL BE REMOVED WHEN THE SEDIMENT DEPTH 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 APPROVED BY THE LOCAL JURISDICTION.
- WHEN CHECK DAMS ARE REMOVED, EXCAVATIONS SHALL BE FILLED WITH SUITABLE COMPACTED BACKFILL. DISTURBED AREA SHALL BE SEEDED AND MULCHED AND COVERED WITH GEOTEXTILE OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

(DETAILS ADAPTED FROM DOUGLAS COUNTY, COLORADO, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCO STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

Stockpile Management (SP)

MM-2



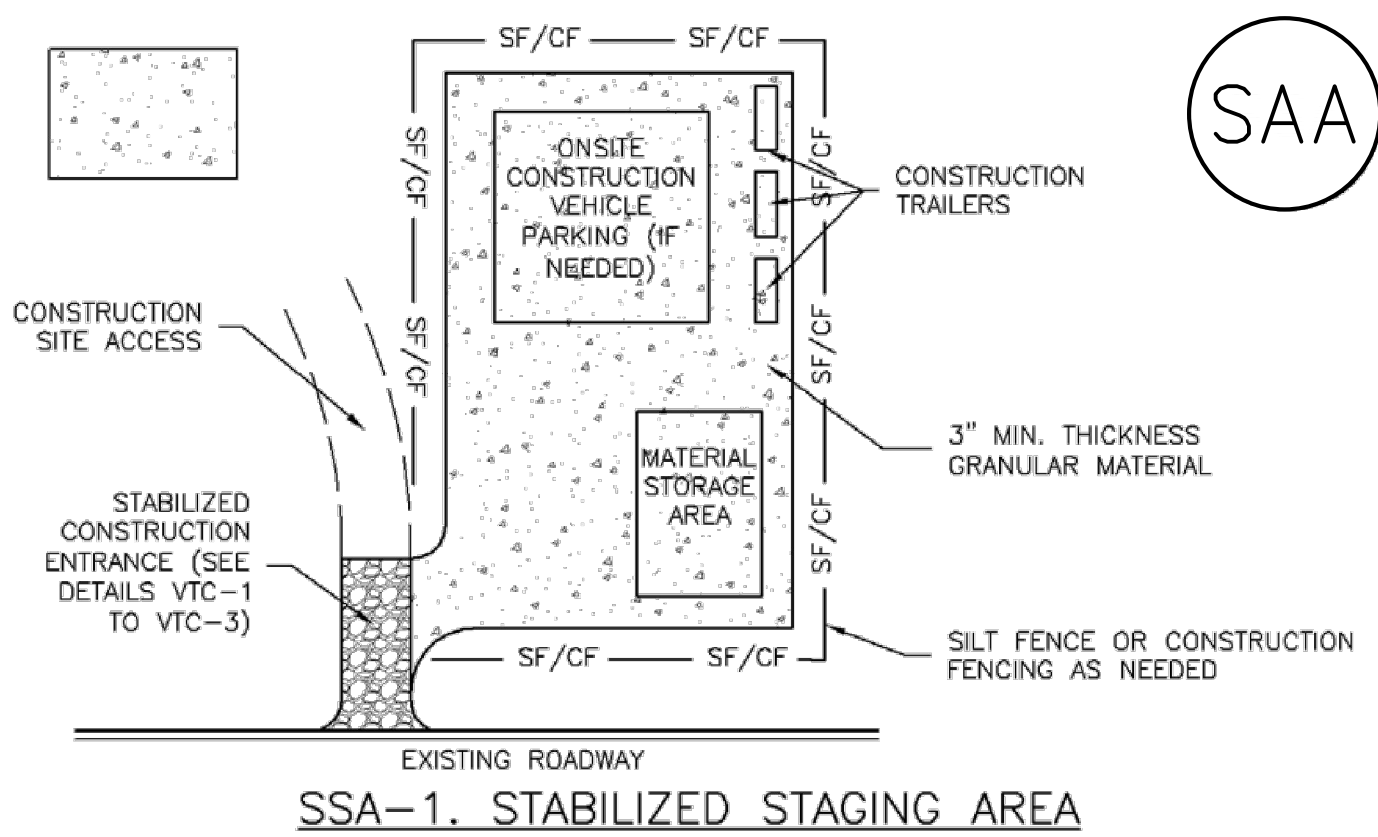
SP-1. STOCKPILE PROTECTION

STOCKPILE PROTECTION INSTALLATION NOTES

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

Stabilized Staging Area (SSA)

SM-6

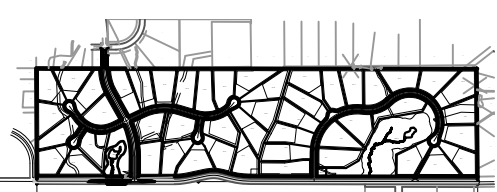



STABILIZED STAGING AREA INSTALLATION NOTES

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

STABILIZED STAGING AREA MAINTENANCE NOTES

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

REFERENCE DRAWINGS X-Title-W-Final X-1105-EX SITE DESIGN	####	####	####	####	SHEET KEY 	BENCHMARK NGS T 294 ELEVATION - 7247.10' NAVD 88 BASIS OF BEARING: A LINE THAT IS 20° NORTH OF AND PARALLEL WITH THE EAST-WEST CETNER LINE OF SECTION 19, T11S, R66W, N89°56:32'W - 5135.84'. THE DIRECTION IS A GRID BEARING OF THE COLORADO STATION PLANE COORDINATE SYSTEM, CENTRAL ZONE, N.A.D. 1983. THE LINE IS MONUMENTED BY 5/8" DIAMETER REBAR, 18" IN LENGTH WITH 1-1/2" ALUMINUM CAPS "LWA PLS 28658"	OWNER: SYLVAN VISTA, INC. WILLIAM F. HEREBIC II, MANAGER 14160 GLENEAGLE DRIVE COLORADO SPRINGS, CO 80921 PREPARED BY: 	SEAL	GRANDWOOD RANCH								
	####	####	####	####					EL PASO COUNTY FINAL GRANDING & EROSION CONTROL PLANS								
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SWMP Inspection & Maintenance Log

Stormwater Management Plan Inspection and Maintenance Log

The Trails at Aspen Ridge

Colorado Springs, CO

(Record inspections, items found maintenance and corrective actions taken. Also, record any training received by Contractor personnel with regard to erosion control, materials handling and any inspections by outside agencies)

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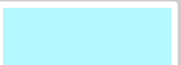
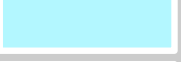





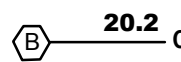
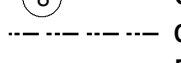
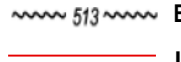



Soil Survey of El Paso County Area Soils Map

FEMA FIRM Floodplain Maps



FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS	 	Without Base Flood Elevation (BFE) Zone A, V, A99 With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, Culvert, or Storm Sewer
OTHER FEATURES		Levee, Dike, or Floodwall
		20.2 Cross Sections with 1% Annual Chance
		17.5 Water Surface Elevation
		Coastal Transect
		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary

NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at <http://msc.fema.gov>. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates refer to the Flood Insurance Study Report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Basemap information shown on this FIRM was provided in digital format by USDA, Farm Service Agency (FSA). This information was derived from NAIP, dated April 11, 2018.

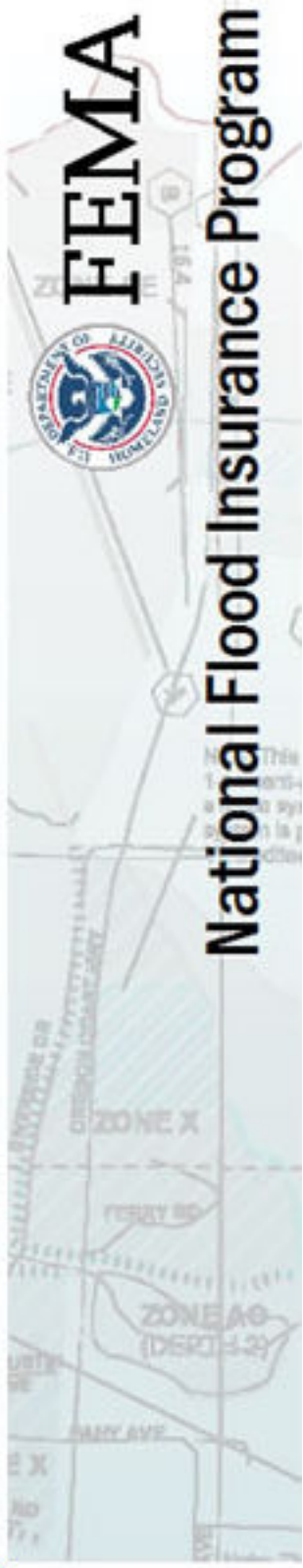
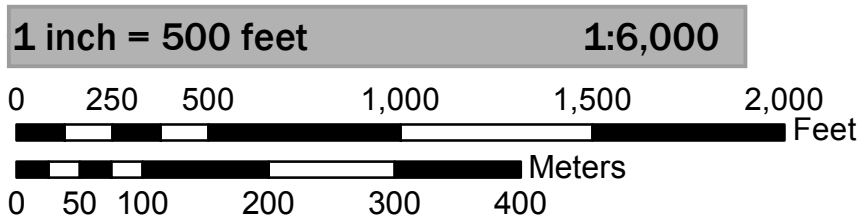
This map was exported from FEMA's National Flood Hazard Layer (NFHL) on 3/8/2019 10:41:59 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time. For additional information, please see the Flood Hazard Mapping Updates Overview Fact Sheet at <https://www.fema.gov/media-library/assets/documents/118418>

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date.

SCALE

Map Projection:
GCS, Geodetic Reference System 1980;
Vertical Datum: NAVD83
For information about the specific vertical datum for elevation features, datum conversions, or vertical monuments used to create this map please see the Flood Insurance Study(FIS) Report for your community at <https://msc.fema.gov>

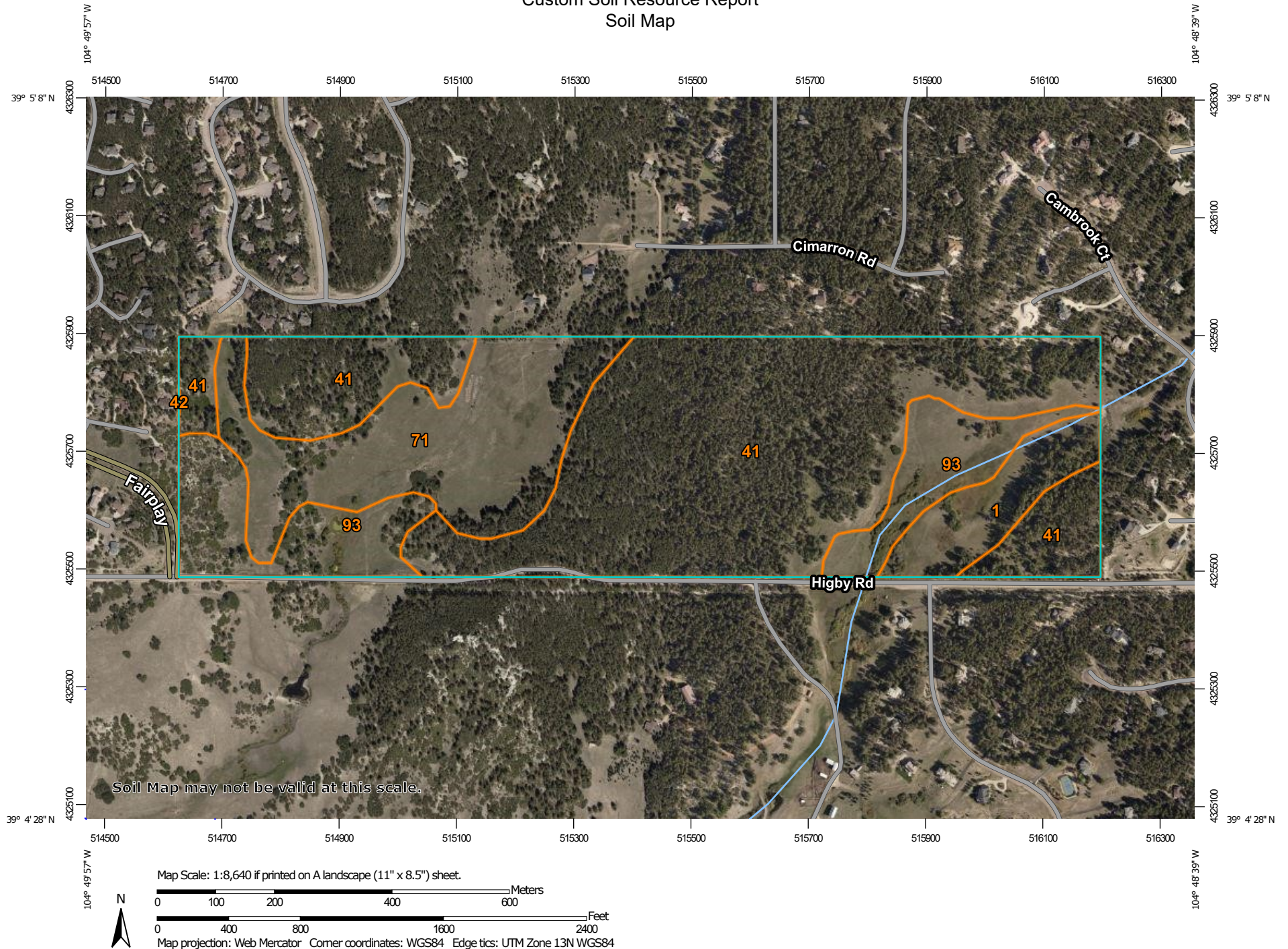


NATIONAL FLOOD INSURANCE PROGRAM FLOOD INSURANCE RATE MAP

EL PASO COUNTY, COLORADO
AND INCORPORATED AREAS
PANEL 279 OF 1275

Panel Contains:		
COMMUNITY	NUMBER	PANEL
EL PASO COUNTY	080059	0279
COLORADO		
TOWN OF MONUMENT	080064	0279
COLORADO		

Custom Soil Resource Report Soil Map



Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features

 Blowout

 Borrow Pit

 Clay Spot

 Closed Depression

 Gravel Pit

 Gravelly Spot

 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water

 Perennial Water

 Rock Outcrop

 Saline Spot

 Sandy Spot

 Severely Eroded Spot


 Sinkhole

 Slide or Slip

 Sodic Spot

 Spoil Area

 Stony Spot

 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

Water Features

 Streams and Canals

Transportation

 Rails


 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 17, Sep 13, 2019

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

Date(s) aerial images were photographed: Aug 19, 2018—Sep 23, 2018

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1	Alamosa loam, 1 to 3 percent slopes	10.1	6.4%
41	Kettle gravelly loamy sand, 8 to 40 percent slopes	91.6	57.5%
42	Kettle-Rock outcrop complex	0.0	0.0%
71	Pring coarse sandy loam, 3 to 8 percent slopes	33.4	20.9%
93	Tomah-Crowfoot complex, 8 to 15 percent slopes	24.2	15.2%
Totals for Area of Interest		159.3	100.0%

Map Unit Descriptions

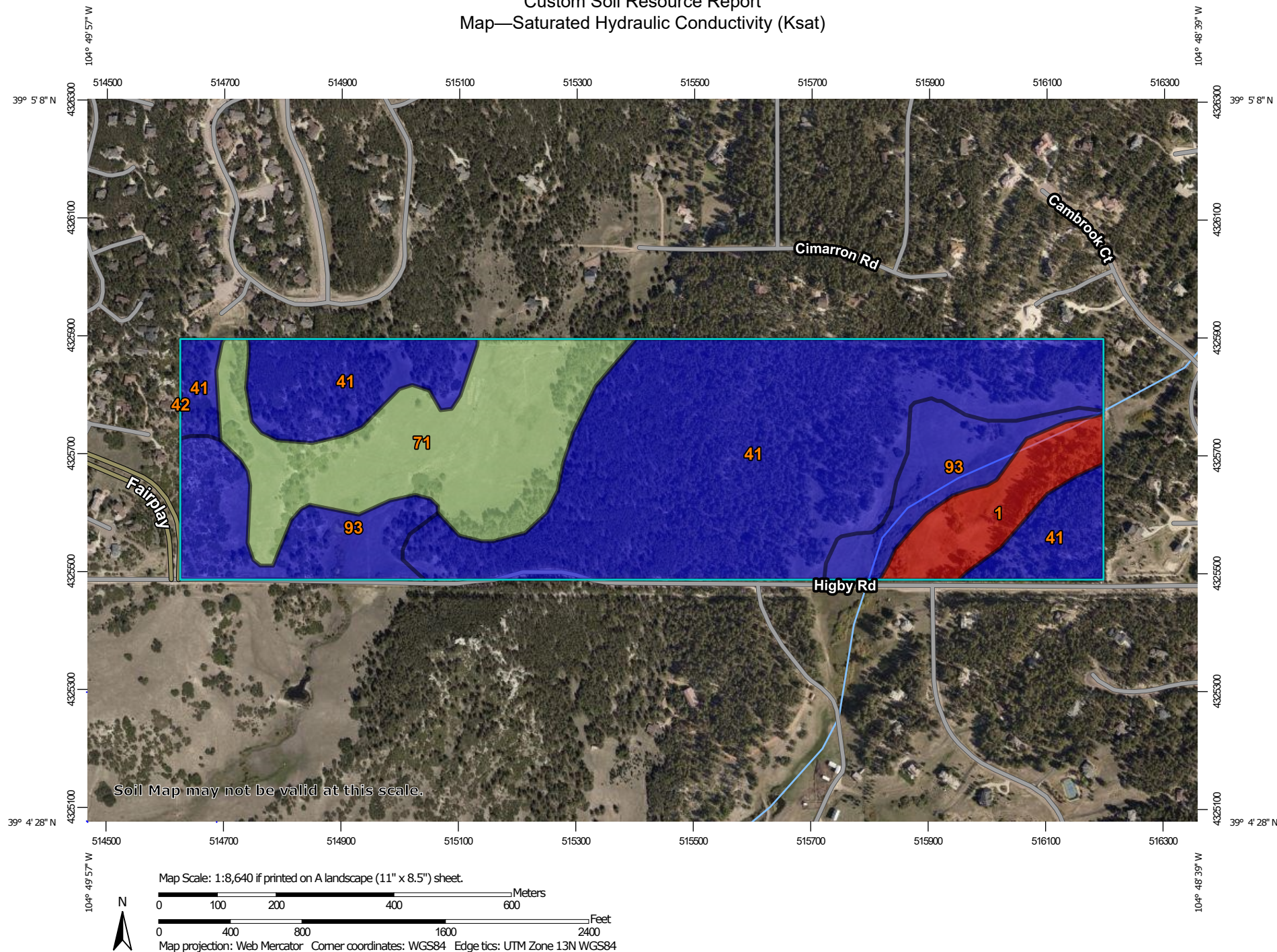
The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

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

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

Custom Soil Resource Report

Map—Saturated Hydraulic Conductivity (Ksat)




Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)





 Area of Interest (AOI)

Background





 Aerial Photography

Soils





Soil Rating Polygons

-  ≤ 9.0000
-  > 9.0000 and ≤ 28.0000
-  > 28.0000 and ≤ 92.0000
-  Not rated or not available


Soil Rating Lines

-  ≤ 9.0000
-  > 9.0000 and ≤ 28.0000
-  > 28.0000 and ≤ 92.0000
-  Not rated or not available






Soil Rating Points

-  ≤ 9.0000
-  > 9.0000 and ≤ 28.0000
-  > 28.0000 and ≤ 92.0000
-  Not rated or not available

Water Features

 Streams and Canals

Transportation

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

MAP INFORMATION

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

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

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Table—Saturated Hydraulic Conductivity (Ksat)

Map unit symbol	Map unit name	Rating (micrometers per second)	Acres in AOI	Percent of AOI
1	Alamosa loam, 1 to 3 percent slopes	9.0000	10.1	6.4%
41	Kettle gravelly loamy sand, 8 to 40 percent slopes	92.0000	91.6	57.5%
42	Kettle-Rock outcrop complex	92.0000	0.0	0.0%
71	Pring coarse sandy loam, 3 to 8 percent slopes	28.0000	33.4	20.9%
93	Tomah-Crowfoot complex, 8 to 15 percent slopes	92.0000	24.2	15.2%
Totals for Area of Interest			159.3	100.0%

Rating Options—Saturated Hydraulic Conductivity (Ksat)

Units of Measure: micrometers per second

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Fastest

Interpret Nulls as Zero: No

Layer Options (Horizon Aggregation Method): Surface Layer (Not applicable)

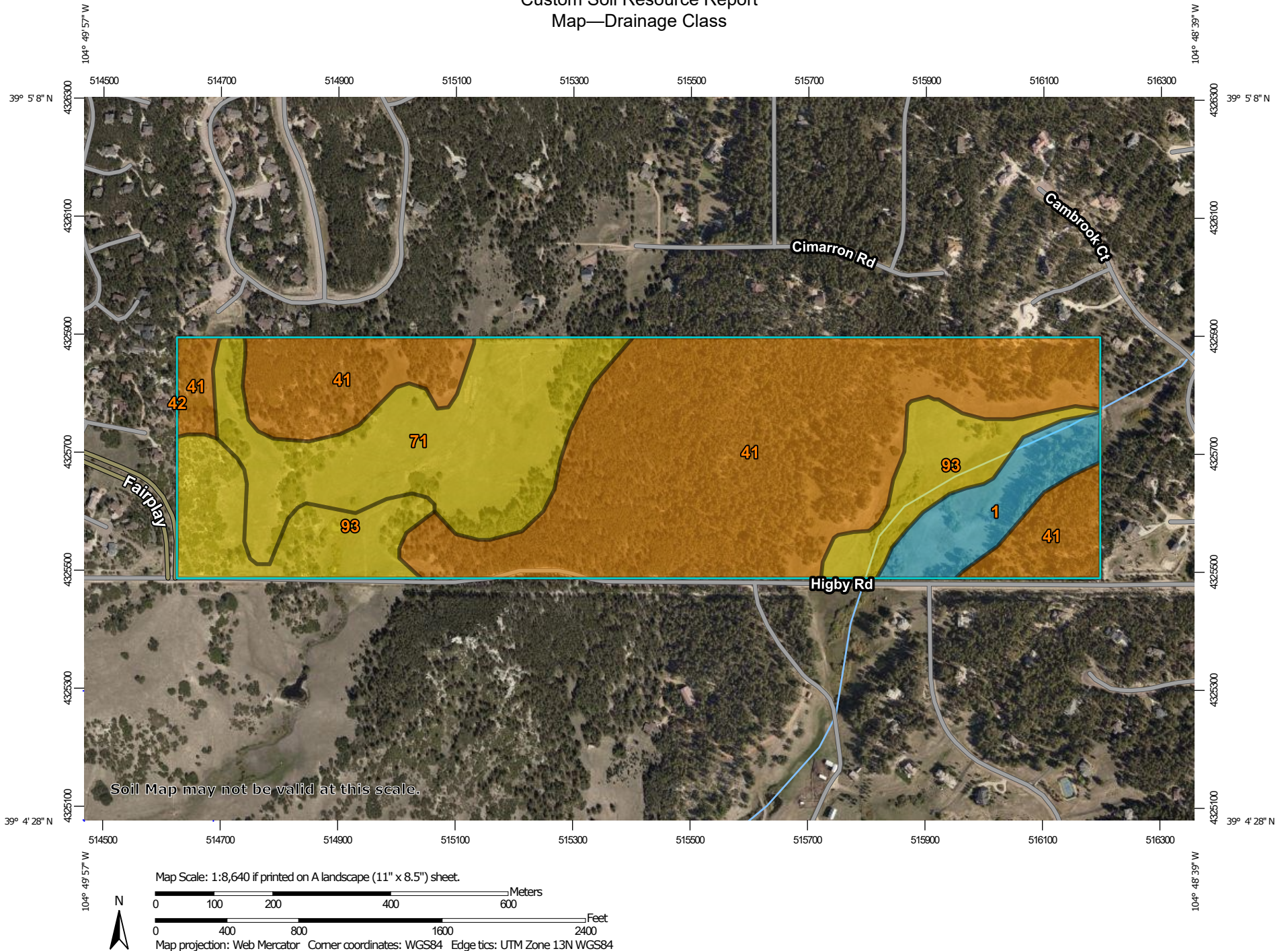
Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Drainage Class

"Drainage class (natural)" refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized-excessively drained,

Custom Soil Resource Report Map—Drainage Class



Custom Soil Resource Report



















MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

Soil Rating Polygons


	Excessively drained		Excessively drained
	Somewhat excessively drained		Somewhat excessively drained
	Well drained		Well drained
	Moderately well drained		Moderately well drained
	Somewhat poorly drained		Somewhat poorly drained
	Poorly drained		Poorly drained
	Very poorly drained		Very poorly drained
	Subaqueous		Subaqueous
	Not rated or not available		Not rated or not available

Soil Rating Lines






	Excessively drained
	Somewhat excessively drained
	Well drained
	Moderately well drained
	Somewhat poorly drained
	Poorly drained
	Very poorly drained
	Subaqueous
	Not rated or not available

Soil Rating Points

Water Features

 Streams and Canals

Transportation

	Rails
	Interstate Highways
	US Routes
	Major Roads
	Local Roads

Background

 Aerial Photography

MAP INFORMATION

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Table—Drainage Class

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
1	Alamosa loam, 1 to 3 percent slopes	Poorly drained	10.1	6.4%
41	Kettle gravelly loamy sand, 8 to 40 percent slopes	Somewhat excessively drained	91.6	57.5%
42	Kettle-Rock outcrop complex	Somewhat excessively drained	0.0	0.0%
71	Pring coarse sandy loam, 3 to 8 percent slopes	Well drained	33.4	20.9%
93	Tomah-Crowfoot complex, 8 to 15 percent slopes	Well drained	24.2	15.2%
Totals for Area of Interest			159.3	100.0%

Rating Options—Drainage Class

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Hydrologic Soil Group

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

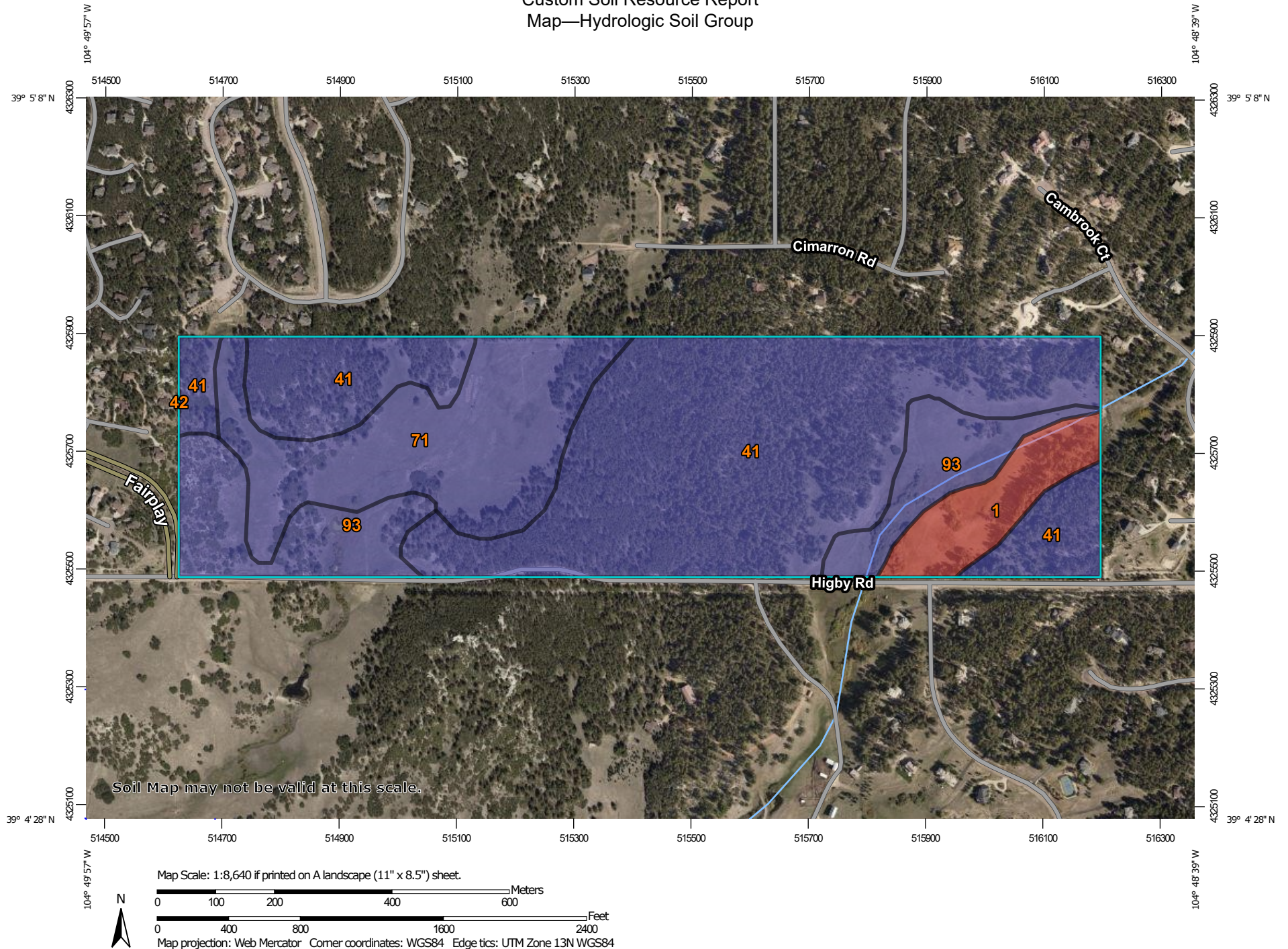
The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or


Custom Soil Resource Report Map—Hydrologic Soil Group



Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

Soil Rating Polygons





 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Lines


 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Points






 A
 A/D
 B
 B/D

 C
 C/D
 D
 Not rated or not available

Water Features

 Streams and Canals

Transportation

 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads

Background

 Aerial Photography

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Table—Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
1	Alamosa loam, 1 to 3 percent slopes	D	10.1	6.4%
41	Kettle gravelly loamy sand, 8 to 40 percent slopes	B	91.6	57.5%
42	Kettle-Rock outcrop complex	B	0.0	0.0%
71	Pring coarse sandy loam, 3 to 8 percent slopes	B	33.4	20.9%
93	Tomah-Crowfoot complex, 8 to 15 percent slopes	B	24.2	15.2%
Totals for Area of Interest			159.3	100.0%

Rating Options—Hydrologic Soil Group*Aggregation Method: Dominant Condition**Component Percent Cutoff: None Specified**Tie-break Rule: Higher*

CDPHE General Permit