

**Construction Activities Stormwater Management Plan (SWMP)
Grading, Erosion and Stormwater Quality Control Plan
Cherry Creek Crossing, Filing No. 1 Lot 111
El Paso County, Colorado
39.0717°N, -104.7640°W**

Owner/Developer:
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Prepare-d by:
The logo for Kiowa Engineering Corporation features the word "Kiowa" in a large, bold, black sans-serif font. Below "Kiowa" is a stylized graphic of a landscape with blue hills and green grass. Underneath the graphic, the words "Engineering Corporation" are written in a smaller, black sans-serif font. The entire logo is underlined with two horizontal lines.

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Kiowa Project No. 14028

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STATE STORMWATER DISCHARGE PERMIT REQUIREMENTS

At least ten days prior to the anticipated start of construction activities (i.e. the initial disturbance of soils associated with clearing, grading, excavation activities, installation of structural Best Management Practices, or other activities), for projects that will disturb one (1.0) acre or more, the owner or operator of the construction activity must submit an application as provided by the Colorado Department of Public Health and Environment, Water Quality Control Division (Division). This form may be reproduced and is also available from the Division's web site. Applications received by the Division are processed and a permit certification and other relevant materials will be sent to the attention of the legally responsible person. The application contains certification of completion of a storm water management plan (SWMP). Do not include a copy of the Stormwater Management Plan, unless requested by the Division.

For information or application materials contact:

Colorado Department of Public Health and Environment
Water Quality Control Division
WQCD-P-B2
4300 Cherry Creek Drive South
Denver, Colorado 80246-1530
<https://www.colorado.gov/pacific/cdphe/wq-construction-general-permits>

Electronic Application – CDPHE website:

<https://www.colorado.gov/pacific/cdphe/WQ%20permits%20construction%20electronic%20application>

I. STORMWATER MANAGEMENT PLAN OBJECTIVES

The objective of the Stormwater Management Plan (SWMP) is “to identify possible pollutant sources that may contribute pollutants to stormwater and identify Best Management Practices (BMPs) that, when implemented, will reduce or eliminate any possible water quality impacts. The SWMP must be completed and implemented at the time the project breaks ground and revised as construction proceeds, to accurately reflect the conditions and practices at the site (CDPHE *Stormwater Management Plan Preparation Guidance*)”. A general schedule or phasing of BMPs will be determined by construction schedule and ground disturbances necessitating required erosion control methods/BMPs. The SWMP shall be implemented until expiration or inactivation of permit coverage. Evaluations of and modifications to this plan may be necessary during the length of the construction project until the site is finally stabilized.

SWMP Plan Availability: A copy of the Stormwater Discharge Permit from the State of Colorado, SWMP Report, SWMP Site Map, SWMP Notes and Details; and inspection reports shall be kept on site by the SWMP Administrator and be made available at any time for use by the operator/SWMP Administrator and to be available for inspection by federal, state and local agencies. If an office location is not available at the site, the SWMP must be managed so that it is available at the site when construction activities are occurring (for example: by keeping the SWMP in the superintendent’s vehicle). The permittee shall retain copies of the SWMP and all reports required by the Permit and records of all data used to complete the Permit application for three (3) years minimum after expiration or inactivation of permit coverage, unless the community requires a longer period.

This SWMP should be viewed as a “living document” that is continuously being reviewed and modified as a part of the overall process of evaluating and managing stormwater quality issues at the site. The SWMP Administrator shall amend the SWMP when there is a change in design, construction, operation or maintenance of the site which would require the implementation of new or revised BMPs or if the SWMP proves to be ineffective in achieving the general objectives of controlling pollutants in stormwater discharges associated with construction activity or when BMPs are no longer necessary and are removed. If the SWMP Administrator feels that modifications to the BMPs shown on the SWMP are necessary to provide for a more effective plan, the process will include: 1) Evaluate pollutant sources, 2) Select BMPs, 3) Document BMPs, 4) Implement BMPs.

SWMP revisions must be made prior to changes in the site conditions, except for “Responsive SWMP Changes” as follows:

- SWMP revision must be made immediately after changes are made in the field to address BMP installation and/or implementation issues; or
- SWMP revisions must be made as soon as practicable, but in no case more than 72 hours, after change(s) in BMP installation and/or implementation occur at the site that require development of materials to modify the SWMP
 - ◊ A notation must be included in the SWMP prior to the site change(s) that includes the time and date of the change(s) in the field, and identification of the BMP(s) removed or added and the location(s) of the BMP(s). Modifications to the SWMP shall be submitted to the County within seven days.

An El Paso County Grading Permit is required along with a Colorado Discharge Permit System (CDPS), Stormwater Discharge Associated with Construction Activities Permit from the Colorado Department of Public Health and Environment for this project. The general conditions associated with the permits must be followed through the duration of the land disturbing activities at the site. For additional details or more specific information on the CDPS permit, consult the CDPS General Permit No. COR-030000. County Grading Permit: Signoff and acceptance of the Grading, Erosion and

Stormwater Quality Control Plan by the County constitutes a Grading Permit authorizing the approved land disturbance and implementation of the approved erosion and stormwater quality control measures.

A. State Permit Applicant

The State Permit applicant (also referred to as the Permittee) must be a legal entity that meets the definition of the owner and/or operator of the construction site, in order for this application to legally cover the activities occurring at the site. The applicant must have day-to-day supervision and control over activities at the site and implementation of the SWMP. Although it is acceptable for the applicant to meet this requirement through the actions of a contractor, as discussed in the examples below, the applicant remains liable for violations resulting from the actions of their contractor and/or subcontractors. Examples of acceptable applicants include:

Owner or Developer - An owner or developer who is operating as the site manager or otherwise has supervision and control over the site, either directly or through a contract with an entity such as those listed below.

General Contractor or Subcontractor - A contractor with contractual responsibility and operational control (including SWMP implementation) to address the impacts construction activities may have on stormwater quality.

Other Designated Agents/Contractors - Other agents, such as a consultant acting as construction manager under contract with the owner or developer, with contractual responsibility and operational control (including SWMP implementation) to address the impacts construction activities may have on stormwater quality.

Refer to the CDPHE, *Stormwater Management Plan Preparation Guidance* for additional information.

The Permittee shall be legally responsible for compliance with the State Permit.

B. SWMP Terms

Best Management Practices (BMPs): BMPs 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 BMPs appropriate for a particular construction site are largely dependent of the types of potential pollutant sources present, the nature of the construction activity, and specific-site conditions.

Nonstructural BMPs, such as preserving natural vegetation, preventive maintenance and spill response procedures, schedules of activities, prohibition of specific practices, education, and other management practices are mainly operational or managerial techniques.

Structural BMPs include treatment processes and practices ranging from diversion structures and silt fences, to retention ponds and inlet protection.

Construction Start Date: This is the day when ground disturbing activities are expected to begin, including grubbing, stockpiling, excavating, demolition, and grading activities.

Disturbance Area Determination: Aside from clearing, grading and excavation activities, disturbed areas also include areas receiving overburden (e.g., stockpiles), demolition areas, and areas with heavy equipment/vehicle traffic and storage that disturb existing vegetative cover.

Final Stabilization Date: In terms of permit coverage, this is when the site is finally stabilized. This 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 (refer to Final Stabilization Section). Permit coverage must be maintained until the site has reached Final Stabilization. Even if only one part of the project is being done, the estimated final stabilization date must be for the overall project. If permit coverage is still required once your part is completed, the permit certification may be transferred or reassigned to a new responsible entity(s).

SWMP Drawings: Also known as the SWMP Site Map.

C. Contractor Required Items

The Contractor shall include and/or provide the following items prior to beginning land disturbing activities:

- Add the SWMP Administrator and Alternate with phone numbers to this plan.
- Construction Dates – Verify the construction dates indicated in this report. Update as necessary to reflect the planned schedule.
- Material Handling and Spill Prevention procedures – See Section IV-4. Review and modify as necessary.

II. SITE DESCRIPTION

A. Nature of the Construction Activity

The proposed improvement will include overlot grading for, 235 linear feet of 48” reinforced concrete pipe with a 48” flared end section, a concrete manhole and a low tailwater basin.

i. Site Location

The site is an 8.35-acre commercial site located at 3415 Double Tree Court in the northwest corner of the intersection of Hodgen Road and Colorado State Highway 83 in El Paso County, Colorado. The site is located within a portion of Section 22, Township 11 South, Range 66 West of the 6th Principal Meridian, in Colorado Springs, Colorado. The El Paso County Assessor parcel number is 61220 07 015. The location of the site is shown on the Vicinity Map (Figure 1).

ii. Adjacent Areas

The project is bordered by residential land on the west, north and east and undeveloped grazing land on the south.

B. Sequence of Major Activities

The major construction activities associated with this project are shown in the table below along with an approximate timing of the sequence. In general, the SWMP Administrator and the Contractor will identify the precise schedule to be used during the term of this project and modify this schedule as needed. Minimal clearing and grubbing may be necessary to install the initial erosion control features.

Approximate Sequence of Major Construction Activities:

Installation of Initial BMPs	October 2018
Clearing and Grubbing	October 2018
Site Grading and Detention Construction	October 2018- January 2019

Seeding, Mulching and Blanket Installation
End Construction (refer to *Final Stabilization...* section)

January 2019

January 2019

The temporary erosion control measures can be removed when Final Stabilization has occurred. Refer to the Final Stabilization section for a description of the requirements.

C. Estimate of Area and Volume Disturbed

The total site area associated with the project and to be disturbed is approximately 7.5 acres. The estimated area of disturbance corresponds to that necessary to perform the overlot grading, construct the manhole, 54" concrete reinforced pipe, and low tailwater basin. Locations of disturbed areas are as shown on the SWMP Site Map. All other areas are planned to remain undisturbed.

Earthwork cut and fill operations will require 73 cubic yards of Cut and 43,000 cubic yards of Fill for a net of 42,927 cubic yards Fill. The net Fill will be imported from off-site sources.

D. Soil Data and Groundwater

Soils within the property are classified to be within Hydrologic Soils Group B as shown in the El Paso County Soils Survey. The soils are identified as Cruickton sandy loam and Ellicott loamy coarse sand. These soils have a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately well drained soils that have moderately fine texture to moderately coarse texture and a moderate to high hazard of erosion.

The pre-construction 100-year runoff coefficient for the site is 0.25 and the post-construction runoff coefficient is roughly 0.25.

E. Existing Vegetation and Ground Cover

The existing vegetation is high plains grassland that was formerly as used for ranching. Several pine trees are also present on site. An existing gravel road traverses the site. The vegetation around the site is in fair to good condition depending on the location and appears to be mowed regularly. The ground slopes are rolling and generally mild. The overall vegetative cover is estimated at about 75%.

It is recommended that the contractor take pictures of the existing vegetative cover prior to construction and any calculations they feel necessary to make the Final Stabilization comparison (refer to Final Stabilization section for additional information). The contractor will be responsible for providing the documentation to make this comparison to the County and the State of Colorado, Water Quality Control Division.

F. Potential Pollution Sources

The potential pollution sources for the site that may have an impact to stormwater include the following items:

1. Ground disturbing activities and grading - Sediment
2. Off-site vehicle tracking - Sediment
3. Vehicle maintenance or fueling - Fuel, oil, chemicals
4. Storage of disposal items - Sediment
5. Soil, aggregate and sand stockpiling - Sediment
6. Construction Dewatering - Sediment
7. Storage of fertilizers, materials or chemicals - Chemicals
8. Concrete washouts - Concrete, slurry
9. Haul routes - Sediment, fuel, oil
10. Landscaping - Fertilizers, sediment, over-watering, pesticides

11. Portolet – Chemicals, human waste

G. Non-stormwater Discharges

In the present condition there are no known non-stormwater discharges from the project site, such as springs and landscape irrigation return flows. During construction, the following non-stormwater discharges from the project site could occur.

1. Construction dewatering – is not anticipated. If groundwater should be encountered, a CDPHE construction dewatering permit will be required prior to performing the dewatering activities. A dewatering bag or other approved BMP shall be used.
2. Release of concrete washout water – Is anticipated. The washout water should be contained within the concrete washout BMP.
3. Runoff from water used for dust control – Not anticipated. The contractor should limit the amount of water used for dust control to an amount less than would result in runoff. Perimeter control BMPs are planned to filter water that may runoff.

If any other non-stormwater discharges from the site become apparent during the term of construction, the occurrence and mitigation shall be addressed by the SWMP Administrator.

H. Receiving Waters

The project area will drain by overland flow into an existing storm sewer under Double Tree Court which will then discharge to West Cherry Creek, is tributary of Cherry Creek.

Immediate Receiving water(s): West Cherry Creek

Ultimate Receiving Water(s): Cherry Creek

There are no irrigation canals or ditches within the site. The site is not located within a regulatory floodplain based on Flood Insurance Rate Map 08041C0285F, with an effective date of March 17, 1997.

III. SWMP SITE MAP CONTENTS

The SWMP Site Map and SWMP Drawings are considered a part of this plan. It identifies the following:

1. Construction site boundaries;
2. All areas of ground disturbance;
3. Existing and proposed topography;
4. Areas used for storage of building materials, equipment, soil, stockpiles or waste;
5. Locations of all structural BMPs;
6. Locations of non-structural BMPs where applicable;
7. Locations of springs, streams, wetlands, detention basins, roadside ditches and other surface waters.

The SWMP Site Map must be updated and or red-lined by the SWMP Administrator on a regular basis to reflect current conditions of the site at all times. The SWMP site maps are contained at the rear of this report.

IV. STORMWATER MANAGEMENT CONTROLS

A. SWMP Administrator

The Permittee shall designate the SWMP Administrator. The SWMP Administrator is typically the Contractor or his/her designated representative and is responsible for developing, implementing, maintaining and revising the SWMP. The SWMP Administrator is the contact person with the County and State for all matter pertaining to the SWMP. The SWMP Administrator is the person responsible for the SWMP accuracy, completeness and implementation. Therefore, the SWMP Administrator should be a person with authority to adequately manage and direct day to day stormwater quality management activities at the site. The SWMP Administrator shall have the authority to act on behalf of the Permittee(s) to ensure the site remains in compliance with the CDPS Stormwater Discharge Associated with Construction Activities Permit and the County's Grading Permit. An Alternate SWMP Administrator who is able to serve in the same capacity as the SWMP Administrator shall also be selected.

The SWMP Administrator shall be present at the project site a majority of the time and (along with the Alternate SWMP Administrator) shall provide the County with a 24-hour emergency contact number.

If the SWMP Administrator or Alternate changes for any reason, it shall be noted/redlined on this Plan. The County shall be notified in writing of any change.

SWMP Administrator: _____

Phone: _____

Alternate SWMP Administrator: _____

Phone: _____

B. Identification of Potential Pollutant Sources:

At a minimum, the following sources and activities shall be evaluated for the potential to contribute pollutants to stormwater discharges and identified in the SWMP if found to have such potential. The sources of any potential pollutants must be controlled through BMP selection and implementation. Each pollutant source recognized through this process as having the potential to contribute pollutants to stormwater, must be identified in the SWMP along with the specific stormwater management control (BMPs) that will be implemented to adequately control the source. (Note: the actual evaluation of the potential pollutant sources does NOT need to be included in the SWMP – just the resultant pollutant sources and their associated BMPs.). The SWMP Administrator shall determine the need for and locations of each of the following potential pollutant sources during the construction project.

Could it Contribute?	Potential Pollutant Source	BMP Implemented to Control Source
Yes	All disturbed and stored soils	Silt fence, sediment basins, sediment control logs, rock socks, seed and mulch
Yes	Vehicle tracking of sediments	Vehicle tracking control, street sweeping
No	Management of contaminated soils	
Yes	Loading and unloading operations	Stabilized staging area, materials storage area, vehicle tracking control, silt fence
Yes	Outdoor storage activities (building materials, fertilizers, chemicals, etc.)	Stabilized staging area, materials storage area, silt fence
Yes	Vehicle and equipment maintenance and fueling	Stabilized staging area, materials storage area, silt fence
Not expected	Significant dust or particulate generating processes	Control by sprinkling with water and other appropriate means.
Yes	Routine maintenance activities involving fertilizers, pesticides, detergents, fuels, solvents, oils, etc	Use as recommended by manufacturer and in areas specified, silt fence
Yes	On-site waste management practices (waste piles, liquid wastes, dumpsters, etc)	Stabilized staging area, silt fence, non-structural BMPs
Yes	Concrete truck/equipment washing, including the concrete truck chute and associated fixtures and equipment	Concrete washout area, stabilized staging area, vehicle tracking control, silt fence
No	Dedicated asphalt and concrete batch plants	
Yes	Non-industrial waste sources such as worker trash and portable toilets	Stabilized staging area, construction fence, non-structural BMPs
Yes	Other areas or procedures where potential spills can occur	Non-structural BMPs, construction fence

C. Best Management Practices (BMPs) for Pollution Prevention

1. A list of the Structural BMPs for erosion and sediment control implemented on the site to minimize erosion and sediment are as follows. Refer to the SWMP Drawings for Installation and Maintenance requirements for each structural BMP and refer to the SWMP drawings for the location of the BMPs.
 - a) Concrete Washout Area (CWA): An approved portable concrete washout system, or a shallow excavation with a small perimeter berm to isolate concrete truck washout operations.
 - b) Erosion Control Blanket (ECB): Slopes equal to greater than the steepness indicated on the plans shall be protected with an erosion control blanket.
 - c) Seeding and Mulching (SM): Temporary seeding and mulching can be used to stabilize disturbed areas that may become inactive for an extended period. Permanent seeding should be used to stabilize areas at final grade that will not otherwise be stabilized.
 - d) Silt Fence (SF): A temporary sediment barrier constructed of woven fabric stretched across supporting posts.

- e) Materials Storage Area/Stabilized Staging Area (MSA/SSA): Consists of stripping topsoil and spreading a layer of granular material in the area to be used for a trailer, parking, storage, unloading and loading.
- f) Sediment Basins (SB): Temporary sediment basins to be provided at two locations to store runoff and sediment during earthwork operations. Basin will be checked after storm events and if required cleared of sediment from the storage pool and around the outlet riser.
- g) Vehicle Tracking Control (VTC): Consists of a rock pad that is intended to help strip mud from tires prior to vehicles leaving the construction site. Installed at all entrance/exit points to the site. The number of access points shall be minimized.

Minimal clearing and grubbing may be necessary prior to installing the initial erosion control features.

No clearing, grading, excavation, filling or other land disturbing activities shall be permitted until signoff and acceptance of the Grading, Erosion and Stormwater Quality Control Plan is received from the County.

Once signoff and acceptance is received, the approved erosion and sediment control measures must be installed before land-disturbing activities are initiated so that no adverse effect of site alteration will impact surrounding property.

2. Non-structural practices for erosion and sediment control to be used to minimize erosion and sediment transport are:

Seeding and mulching in areas that will not be hard surfaced. Minimize the amount of existing vegetation to be removed during construction, leaving native vegetation in place when possible. Only the existing vegetation that is specified or requiring removal shall be disturbed or removed. If possible, leave existing ground cover in place or remove just prior to grading to minimize the length of soil exposure.

3. Phased BMP Implementation:

The SWMP Administrator shall update the BMP Implementation if necessary to meet and/or address the Contractor's schedule. The SWMP shall be updated as necessary to reflect the BMPs installed.

- a) Installation of Initial BMPs

Prior to any construction activities, erosion control facilities shall be installed. Minimal clearing and grubbing may be necessary prior to installing the initial erosion control features. Stabilization of cleared or grubbed areas to be completed the same day if possible. The "initial" BMPs include, but may not be limited to, construction fence, silt fence, vehicle tracking control, stabilized staging area, sediment basins, materials storage area and concrete washout area. Designate areas for construction trailer (if used), trash container, portolets, vehicle and equipment parking and material storage. If these areas are not indicated on the plan, the contractor must "red line" the plan with the locations. Provide a confined area for maintenance and fueling of equipment from which runoff will be contained and filtered. BMP / Erosion Control facility waste shall be disposed of properly.

b) Clearing and grubbing (Site Clearing)

The measures included in the previous sequence shall be maintained and continue. The removed cleared and grubbed items, soil and fence shall be disposed of properly. If a soil stockpile area is needed, the area shall be protected as shown in the Details and the stockpile area shall be redlined onto the plan. Existing vegetation to remain shall be protected. Wind erosion shall be controlled on the site by sprinkling and other appropriate means.

c) Site Grading Construction

The measures included in the previous sequence shall be maintained and continue. Dewatering is not expected to occur during the grading. A CDPHE construction dewatering permit is required prior to performing the dewatering activities should such activities become necessary.

d) Landscaping

The measures included in the previous sequence shall be maintained and continue, unless the work requiring the measure is completed. Seeding, mulching and blanketing shall be installed. Avoid excess watering and placing of fertilizers and chemicals.

e) Final Stabilization

The necessary erosion control measures included in the previous sequence shall continue until Final Stabilization is reached. Refer to Final Stabilization section for requirements.

The SWMP Administrator shall amend the SWMP if necessary and as required, refer to Section I.

4. Materials handling and spill prevention:

The SWMP Administrator will inspect daily to ensure proper use and disposal of materials on-site including solvents, fertilizers, chemicals, waste materials and equipment maintenance or fueling procedures. All materials stored on-site will be stored in a neat and orderly manner in the original containers with the original manufacturer's label, and if possible under a roof or other enclosure to prevent contact with stormwater. Chemicals should be stored within berms or other secondary containment devices to prevent leaks and spills from contacting stormwater runoff. Before disposing of the container, all of a product will be used up whenever possible and manufacture's recommendations for proper disposal will be followed according to state and local regulations.

Material and equipment necessary for spill cleanup will be kept in the material storage area on-site. Manufacturer's recommendations for spill cleanup will be posted and site personnel will be made aware of the procedures along with the location of the information and cleanup supplies.

The contractor shall have spill prevention and response procedures that include the following:

- a) Notification procedures to be used in the event of an accident. At the very least, the SWMP Administrator should be notified. Depending on the nature of the spill and the material involved, the Colorado Department of Public Health and Environment (24-hour spill reporting line – 877-518-5608), downstream water users or other agencies may also need to be notified.
- b) Instructions for clean-up procedures and identification of spill kit location(s).
- c) Provisions for absorbents to be made available for use in fuel areas and for containers to be available for used absorbents
- d) Procedures for properly washing out concrete truck chutes and other equipment in a manner and location so that the materials and wash water cannot discharge from the site and never into a storm drain system or stream.

5. Dedicated concrete or asphalt batch plants:

No dedicated concrete or asphalt batch plants will be used.

6. Vehicle tracking control:

Off-site vehicle tracking of sediment shall be minimized and is as shown on the SWMP Site Map. Vehicle Tracking Control shall be installed at the construction access points. The contractor shall minimize the number of construction access points to reduce the amount of sediment tracked from the site. Streets shall be kept clean and free of mud, soil and construction waste. Street sweeping or other acceptable methods shall be used to prevent sediment from being washed from the project site. Streets shall not be washed down with water. Street cleaning operations shall occur if necessary or as directed by the County.

7. Waste management and disposal including concrete washout:

A concrete washout area is specified on the SWMP. Concrete wash water shall not be discharged to state waters, to storm sewer systems or from the site as surface runoff. The washout area shall be an approved portable concrete washout system or a shallow excavation with a small perimeter berm to isolate concrete truck washout operations. At the end of construction, all concrete shall be removed from the site and disposed of at an approved waste site. Signs shall be placed at the washout to clearly indicate the concrete washout area to operators of concrete trucks and pump rigs. Refer to the standard detail for requirements.

All construction site waste both liquid and solid must be contained in approved waste containers and disposed of off-site according to state and local regulations. Portable sanitary facilities shall be provided at the site throughout the construction phase and must comply with state and local sanitary or septic system.

8. Groundwater and stormwater dewatering:

Groundwater dewatering is not anticipated on the site to complete the overlot grading. If groundwater is encountered, locations and practices to be implemented to control stormwater pollution from excavations, etc. must be noted on the SWMP. A separate CDPHE construction discharge (dewatering) permit would be required for groundwater dewatering and shall be obtained by the SWMP Administrator. Construction dewatering water cannot be discharged to surface water or to storm sewer systems without separate permit coverage. The discharge of Construction

Dewatering water to the ground, under specific conditions, may be allowed by the Stormwater Construction Permit when appropriate BMPs are implemented. Refer to USDCM Volume III (UDFCD) for County acceptable means of dewatering.

V. FINAL STABILIZATION AND LONG TERM STORMWATER MANAGEMENT

"Final stabilization is reached when all ground surface disturbing activities at the site have been completed and uniform vegetative cover has been established with an individual plant density of at least 70 percent of pre-disturbance levels, or equivalent permanent, physical erosion reduction methods have been employed." When vegetation is used to achieve final stabilization, the 70% vegetation requirement applies to a uniform plant density, which means that all areas of the site that rely on a vegetative cover to achieve stabilization must be uniformly vegetated. The contractor will be responsible for providing the documentation to make this comparison to the County and the State of Colorado, Water Quality Control Division. The stormwater permit allows the permittee to use alternatives to vegetation to achieve final stabilization. All alternatives to vegetation must meet specific criteria to be considered equivalent to vegetation, specifically: stabilization must be permanent, all disturbed areas must be stabilized and alternatives must follow good practices as described in the CDPHE Memo, dated March 5, 2013 (see References).

Temporary seeding for the project site shall include seeding and mulching. For the application methods, soil preparation and seeding and mulching requirements, refer to SWMP Drawings. All slopes of three-to-one (3:1) or steeper must be covered with an erosion control blanket.

Management of storm water after completion of construction will be accomplished by utilizing the practices listed below.

- Upon completion of construction, the site shall be inspected to ensure that all equipment, waste materials and debris have been removed.
- The site will be inspected to make certain that all graded surfaces have been landscaped or seeded with an appropriate ground cover.
- All silt fence, rock socks, etc. and all other control practices and measures that are to remain after completion of construction will be inspected to ensure their proper functioning.
- The contractor shall remove erosion control measures that are not required to remain.

After all construction activities are completed on the site, but final stabilization has not been achieved, the contractor shall make a thorough inspection of the stormwater management system at least once every month.

The contractor shall be responsible for maintaining the BMPs and stormwater controls in good working order and shall also be responsible for the costs incurred until such time as final stabilization is reached. Once final stabilization has been achieved the contractor shall be responsible for removal of the erosion control measures.

Should any of the erosion control facilities (BMPs) become in disrepair prior to the establishment of the native or natural erosion control measures, the Contractor is responsible for the cost of such maintenance. The Contractor is also responsible for the clean-up of offsite areas affected by any sediment that may leave the site. Control of erosion from areas disturbed by channel or storm sewer construction will be the responsibility of the respective contractor. All erosion control measures shown on the plan shall be installed and maintained in accordance with Best Management Practices.

Inactivation of permit coverage: Coverage under the Stormwater Construction Permit may be inactivated by the permittee when the site has attained final stabilization, all temporary erosion and sediment control measures have been removed, and all components of the SWMP are complete.

VI. RECOMMENDED INSPECTION AND MAINTENANCE PROCEDURES

A. Minimum Inspection Schedule

1. Frequency. Contractor should inspect and document Construction BMPs at the following times and intervals.
 - a) After installation of any Construction BMP;
 - b) At least once every 14 days, but a more frequent inspection schedule may be necessary to ensure that BMPs continue to operate as needed to comply with the permit.
 - c) Within 24 hours after a precipitation or snowmelt event that produces runoff or causes surface erosion.
2. Consult State Permit No. COR-030000 for alternate inspection requirements at temporarily idle sites, at completed sites, or for winter conditions.
3. Refer to the Standard Details for the maintenance procedures associated with each BMP.
4. Inspection Procedures. The inspection must include observation of:
 - a) The construction site perimeter and discharge points (including discharges into a storm sewer system);
 - b) All disturbed areas;
 - c) Areas used for material/waste storage that are exposed to precipitation
 - d) Other areas determined to have a significant potential for stormwater pollution, such as concrete washout locations, or locations where vehicles enter or leave the site;
 - e) Erosion and sediment control measures identified in the SWMP; and any other structural BMPs that may require maintenance, such as secondary containment around fuel tanks, or the condition of spill response kits.

The inspection must determine if there is evidence of, or the potential for, pollutants entering the drainage system. BMPs should be reviewed to determine if they still meet the design and operational criteria in the SWMP, and if they continue to adequately control pollutants at the site. Any BMPs not operating in accordance with the SWMP must be addressed as soon as possible, immediately in most cases, to minimize the discharge of pollutants, and the SWMP must be updated as described.

5. Record Keeping and Documenting Inspections: Keeping accurate and complete records serves several functions. First, keeping records of spills, leaks, inspections, etc. is a requirement of the State Stormwater Construction Permit; therefore, enforcement action, including fines, could result if records are not adequate. Second, by keeping accurate and detailed records, you will have documentation of events which could prove invaluable should complications arise concerning the permit, lawsuits, etc.
6. Inspection Checklist/Report. The Permittee must document inspection results and maintain a record of the results for a period of 3 years following expiration or inactivation of permit coverage. These records must be made available to CDPHE, the County or EPA upon request. The SWMP Administrator should record the inspection results on a site-specific standardized inspection report or County Inspection Checklist to be maintained and kept on the construction site. An example template for the inspection report format is included in Appendix. The SWMP Administrator should develop a site-specific inspection report that itemizes the selected

Construction BMPs for their site. At a minimum, the following information from each inspection should be recorded on the site-specific report:

- a) Date of inspection;
- b) Name and title of inspector;
- c) Location(s) of discharges of sediment or other pollutants from the site;
- d) Location(s) of BMPs that need to be maintained;
- e) Location(s) of BMPs that failed to operate as designed or proved inadequate for a particular location;
- f) Location(s) where additional BMPs are needed that were not in place at the time of inspection;
- g) Deviations from the minimum inspection schedule as provided in the permit;
- h) Descriptions of corrective actions for any item above, date(s) of corrective actions taken, and measures taken to prevent future violations, including requisite changes to the SWMP, as necessary and
- i) After adequate corrective action(s) has been taken, or where a report does not identify any incidents requiring corrective actions, the report shall contain a signed statement indicating the site is in compliance with the permit to the best of the signer's knowledge and belief.

7. Inspection Checklists/Reports to County: Completed Inspection Checklists will be submitted electronically to the assigned County Engineering inspector within 5 business days of the inspection. The inspections checklists must also be kept on-site.

B. BMP Operation and Maintenance

The SWMP Administrator is responsible for operation and maintenance of construction BMPs. The SWMP Administrator will inspect the site per inspection and monitoring protocol outlined above and will make any necessary repairs to construction BMPs immediately after a defect or other need for repair is discovered. The project site and the adjacent streets impacted by the construction shall be kept neat, clean and free of debris. The erosion control measures and facilities will be maintained in good working order until final stabilization. Any items that are not functioning properly or are inadequate will be promptly repaired or upgraded. Records of inspections must be kept and be available for review by the State of Colorado Water Quality Control Division or the County.

VII. REFERENCES

- 1) CDPS General Permit: Stormwater Discharges Associated with Construction Activity Permit No. COR-030000. Colorado Department of Public Health and Environment, dated July 1, 2007. Administratively continued effective July 1, 2012.
- 2) CDPHE, Stormwater Discharges Associated with Construction Activity, Stormwater Management Plan Preparation Guidance, prepared by CDPHE, dated April 2011.
- 3) CDPHE Memorandum, Final Stabilization requirements for stormwater construction permit termination, Alternatives to the 70% plant density re-vegetation requirement, prepared by CDPHE, dated March 5, 2013.
- 4) Chapters 6 and 12 of Volume 1 and 2, City of Colorado Springs, Drainage Criteria Manual, by City of Colorado Springs, current edition.

- 5) Volume 3, Urban Storm Drainage Criteria Manual, by Urban Drainage and Flood Control District, current edition.
- 6) City of Colorado Springs/El Paso County Drainage Criteria Manual, 1987.
- 7) El Paso County Area Soil Survey, prepared by the Natural Resources Conservation Service.

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APPENDIX

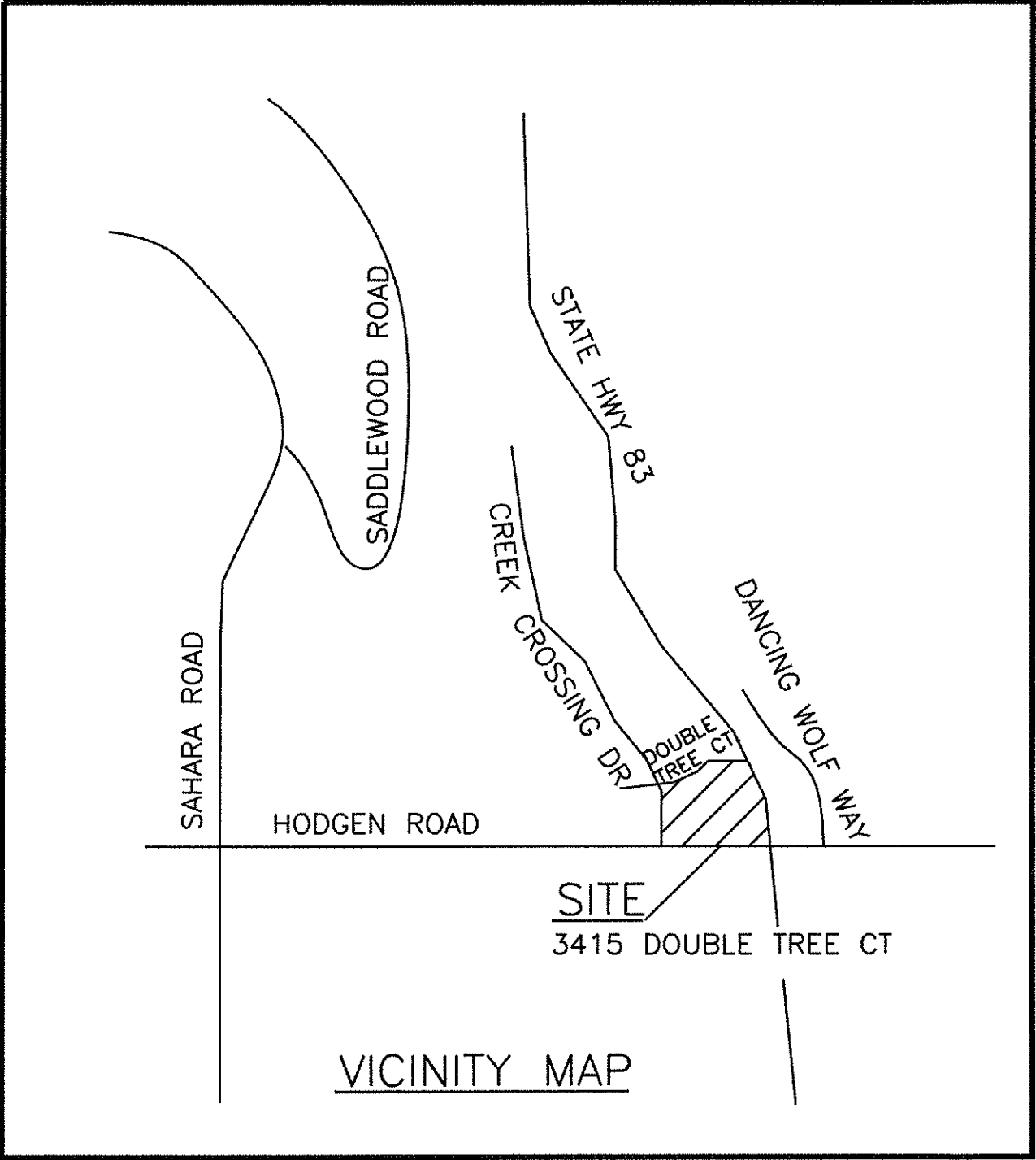
Vicinity Map

APPENDIX A

Example – Exhibit A: Erosion and Sediment Control Field Inspection Report

Example – Exhibit B: Corrective Action Report

APPENDIX
Vicinity Map



SITE
3415 DOUBLE TREE CT

VICINITY MAP

APPENDIX A

Example – Exhibit A: Erosion and Sediment Control Field Inspection Report

Example – Exhibit B: Corrective Action Report

**Exhibit A
Erosion and Sediment Control Field Inspection Report**

Project Name:	Date of Inspection:
Project Address/Location:	Time of Inspection:
Contractor:	Name of Inspector:

Reason for Inspection:

BMP for Erosion Control	Practice Used		Maintenance or Sediment Removal Required		Explain Required Action
	Yes	No	Yes	No	
Concrete Washout Area					
Construction Fence					
Diversion Ditch/Swales/Berms					
Erosion Control Blankets					
Inlet Protection					
Reinforced Rock Berms					
Reinforced Rock Berms - Culvert					
Sediment Basin					
Sediment Control Log					
Seed & Mulch (Temp. or Permanent)					
Silt Fence					
Sodding					
Stabilized Staging Area					
Straw Bale Barrier					
Surface Roughening					
Vehicle Tracking Control Pad					

Contractor's Comments:

Inspector's Comments:

I certify this Erosion and Sediment Control Field Inspection Report is complete and accurate, to my knowledge and belief.

Inspector Signature and Date:	Reviewed By:
-------------------------------	--------------

**Exhibit B
Corrective Action Report**

Site: _____

Inspector: _____

Date: _____

.....
Erosion Control Measure/Facility Requiring Attention:

Recommended Corrective Action:

Scheduled Completion Date: _____ Date Completed: _____

.....
Erosion Control Measure/Facility Requiring Attention:

Recommended Corrective Action:

Scheduled Completion Date: _____ Date Completed: _____

.....
Erosion Control Measure/Facility Requiring Attention:

Recommended Corrective Action:

Scheduled Completion Date: _____ Date Completed: _____

- GENERAL NOTES**
- ALL MATERIALS AND WORKMANSHIP SHALL BE IN CONFORMANCE WITH THE CITY OF COLORADO SPRINGS SPECIFICATIONS (CURRENT EDITION).
 - THE CONTRACTOR SHALL HAVE IN HIS POSSESSION AT ALL TIMES ONE (1) SIGNED COPY OF THE PLANS AND SPECIFICATIONS WHICH HAVE BEEN APPROVED BY THE CITY OF COLORADO SPRINGS (CITY).
 - THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AS-BUILT INFORMATION ON A SET OF RECORD DRAWINGS.
 - THE CONTRACTOR SHALL NOTIFY THE OWNER (CITY) AND ENGINEER OF ANY PROBLEM IN CONFORMING TO THE APPROVED PLANS FOR ANY ELEMENT OF THE PROPOSED IMPROVEMENTS PRIOR TO ITS CONSTRUCTION.
 - THE CONTRACTOR SHALL PROTECT ALL EXISTING FACILITIES IN THE GENERAL AREA OF CONSTRUCTION. THE CONTRACTOR SHALL REPAIR ANY DAMAGE CAUSED BY CONSTRUCTION OPERATIONS AT NO COST TO THE PROJECT.
 - UTILITY LINES AS SHOWN ON THESE DRAWINGS ARE PLOTTED FROM THE BEST AVAILABLE INFORMATION. THE CONTRACTOR SHALL CALL 811 FOR UTILITY LOCATIONS AT LEAST TWO WORKING DAYS PRIOR TO ANY DIGGING. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION AND SHALL PROTECT THEM FROM DAMAGE DURING CONSTRUCTION.
 - A CITY OF COLORADO SPRINGS UTILITIES INSPECTOR IS REQUIRED TO BE ON SITE DURING EXCAVATION AND CONSTRUCTION AROUND GAS AND ELECTRIC FACILITIES. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE WITH THE GAS AND ELECTRIC DEPARTMENT FORTY-EIGHT (48) HOURS PRIOR TO CONSTRUCTION.
 - ALL EARTHWORK, ROADWAY AND TRENCHING OPERATIONS SHALL BE IN CONFORMANCE WITH THE SPECIFICATIONS AND GEOTECHNICAL REPORT.
 - DEPTH OF MOISTURE-DENSITY CONTROL FOR THIS PROJECT SHALL BE AS FOLLOWS: FULL DEPTH OF ALL EMBANKMENTS, BASES OF CUTS AND FILLS 0.5 FOOT.
 - EXCAVATION REQUIRED FOR COMPACTION OF BASES OF CUTS AND FILLS WILL BE CONSIDERED AS SUBSIDIARY TO THAT OPERATION AND WILL NOT BE PAID FOR SEPARATELY.
 - THE TESTING OF COMPACTION FOR THIS PROJECT WILL BE PER AASHTO T 99.
 - ALL EXISTING MANHOLES TO BE MARKED WITH T-POSTS AND CAUTION TAPE PRIOR TO COMMENCING WITH THE CONSTRUCTION.
 - CONTRACTOR SHALL BE RESPONSIBLE FOR THE ESTABLISHMENT, MAINTENANCE AND DEMOBILIZATION OF CONSTRUCTION STAGING AREA(S) WITH THE CITY OF COLORADO SPRINGS.
 - WATER SHALL BE USED AS A DUST PALLIATIVE WHERE REQUIRED. WATER WILL NOT BE PAID FOR SEPARATELY, BUT WILL BE SUBSIDIARY TO THE EXCAVATION ITEM.
 - THE SOIL TO BE PLACED AS TOPSOIL MATERIAL SHALL BE FREE OF REFUSE, STUMPS, ROOTS, ROCKS, BRUSH, WEEDS, HARD CLODS, TOXIC SUBSTANCES OR OTHER MATERIAL WHICH WOULD BE DETRIMENTAL TO ITS USE ON THE PROJECT. IT SHALL HAVE A MINIMUM P.I. OF 5 BUT SHALL NOT BE SUCH HEAVY CLAY AS TO PRECLUDE PLACEMENT WITH A SHOULDER MACHINE.
 - SALVAGEABLE MATERIAL: MATERIAL THAT CAN BE SAVED OR SALVAGED. UNLESS OTHERWISE SPECIFIED IN THE CONTRACT, ALL SALVAGEABLE MATERIAL SHALL BECOME THE PROPERTY OF THE CONTRACTOR.
 - TOPOGRAPHIC DATA INDICATED ON THESE DRAWINGS WAS COMPILED FROM A FIELD SURVEY. CONTRACTOR MUST VERIFY EXTENT OF WORK WITHIN THESE AREAS, DIMENSIONS, ELEVATIONS, AND LOCATIONS OF EXISTING STRUCTURES, PIPELINES, AND UTILITIES ARE APPROXIMATE. WHERE SUCH DIMENSIONS OR LOCATIONS DETERMINE THE LIMITS OF THE WORK, SUCH DIMENSIONS OR LOCATIONS SHALL BE VERIFIED IN THE FIELD PRIOR TO CONSTRUCTION.
 - THE LOCATIONS OF EXISTING STRUCTURES, PIPELINES, UTILITIES, ETC., SHOWN ON THE DRAWINGS HAVE BEEN APPROXIMATED. THERE MAY BE OTHER STRUCTURES, PIPELINES, UTILITIES, ETC., NOT SHOWN ON THE DRAWINGS WHICH PRESENTLY EXIST IN THE AREA OF CONSTRUCTION. THE ENGINEER AND/OR OWNER ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN. THE CONTRACTOR WILL BE RESPONSIBLE FOR LOCATING AND PROTECTING ALL UNEXPECTED EXISTING STRUCTURES, PIPELINES, UTILITIES, ETC., IN THE PROJECT SITE.
 - THE CONTRACTOR SHALL CAREFULLY PRESERVE ALL MONUMENTS, BENCHMARKS, PROPERTY MARKERS, REFERENCE POINTS, AND STAKES. IN CASE OF HIS DESTRUCTION OF THESE, THE CONTRACTOR WILL BE RESPONSIBLE FOR RESETTING SAME, AT NO COST TO THE OWNER, AND SHALL BE RESPONSIBLE FOR ANY LOSS OF TIME THAT MAY BE CAUSED.
 - THE CONTRACTOR SHALL NOTIFY THE ENGINEER WHERE UTILITIES CONFLICT WITH THE WORK IN CONFORMANCE WITH THE SPECIFICATIONS. WHERE FIELD VERIFICATION IS NOTED ON THE PLANS, THIS SHALL REQUIRE THE CONTRACTOR TO DETERMINE THE LOCATION OF THE FACILITY IN QUESTION PRIOR TO CONSTRUCTION. A DETERMINATION SHALL BE MADE BY THE CONTRACTOR IF THE CURRENT DESIGN WILL CONFLICT WITH THE EXISTING FACILITY AND NOTIFY THE ENGINEER IN WRITING.
 - ALL EXISTING AREAS DISTURBED OUTSIDE THE LIMITS OF CONSTRUCTION ACTIVITIES SHALL BE REVEGETATED IN CONFORMANCE WITH THE SPECIFICATIONS AT NO ADDITIONAL COST TO THE PROJECT.
 - ALL EXISTING ROADWAYS, SIDEWALKS AND CURBS DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED OR RECONSTRUCTED IN CONFORMANCE WITH THE SPECIFICATIONS.
 - SIGNAGE SHALL FOLLOW THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" LATEST EDITION AND THE CITY OF COLORADO SPRINGS TRAFFIC ENGINEERING SIGNAGE & PAVEMENT MARKING STANDARDS. CONTRACTOR SHALL SUBMIT TO THE CITY A TRAFFIC CONTROL PLAN PRIOR TO COMMENCING WITH THE WORK.
 - WHERE APPROPRIATE, NEATLY SAW CUT ALL EXISTING CONCRETE AND ASPHALT. THE PLACEMENT OF ADDITIONAL PAVING SHALL BE DONE TO A NEAT WORK LINE, SAW CUTTING A MINIMUM OF ONE (1) FOOT. SAW CUTTING WILL NOT BE PAID FOR SEPARATELY BUT WILL BE CONSIDERED INCIDENTAL TO THE WORK. REPAIR/REPLACE ALL DISTURBED EXISTING ITEMS WITH LIKE MATERIALS AND THICKNESSES. EXISTING CONCRETE PAVEMENT SHALL BE SCORED THEN BROKEN AT JOINT TO CREATE A SURFACE FOR THE CONSTRUCTION JOINT.
 - THE EXISTING CONCRETE CHANNEL REMOVAL SHALL BE DONE TO A NEAT WORK LINE, SAWCUTTING THE FULL DEPTH OF EXISTING CONCRETE.
 - CONTRACTOR SHALL PROTECT EXISTING BUILDINGS, STRUCTURES, ADJOINING PROPERTIES AND PUBLIC THOROUGHFARES FROM DAMAGE DURING CONSTRUCTION.
 - ALL DISCHARGES TO DRAINAGE COURSES AND STORM SEWER SYSTEMS MUST COMPLY WITH THE APPLICABLE PROVISIONS OF THE COLORADO WATER QUALITY CONTROL ACT AND THE COLORADO DISCHARGE PERMIT REGULATIONS, AND ARE SUBJECT TO INSPECTION BY THE CITY OF COLORADO SPRINGS, EL PASO COUNTY, CDOT AND CDPHE. EL PASO COUNTY AND COLORADO SPRINGS HAVE MS-4 PERMITS. CONTRACTOR SHALL DEVISE AND IMPLEMENT A PERMANENT PLAN FOR PERIODIC REMOVAL AND DISPOSAL OF SEDIMENT FROM EROSION CONTROL FACILITIES AND FOR MAINTENANCE OF EROSION CONTROL FACILITIES.
 - SURFACE AND GROUNDWATER AT THE SITE MAY CREATE A NEED FOR DEWATERING DURING CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR THE MAINTENANCE OF TEMPORARY DEWATERING STRUCTURES, NECESSARY PERMITS AND PROVIDE FOR SAFE AND STABLE DISCHARGE OF WATER FROM THE CONSTRUCTION SITE. THE COST OF DEWATERING IS INCIDENTAL TO THE CONSTRUCTION AND WILL NOT BE PAID FOR UNDER A SPECIFIC ITEM IN THE BID DOCUMENTS.
 - NO PAVEMENT DROP-OFFS WILL BE ALLOWED TO REMAIN OVERNIGHT. DROP-OFFS TO BE TEMPORARILY FILLED WITH ASPHALT AT 3:1 MINIMUM SLOPE WITH DELINEATOR POLES MARKING THE UPPER EDGE OF DROP-OFF.
 - BENCHMARK: FIMS MONUMENT NUMBER VP21 EL=6108.17 (NAVD 29)

STRUCTURAL CONCRETE NOTES:

ALL CONSTRUCTION INVOLVING THE PLACEMENT OF STRUCTURAL CONCRETE SHALL BE COMPLETED IN ACCORDANCE WITH SECTION 600 OF THE CITY OF COLORADO SPRINGS ENGINEERING DIVISION STANDARD SPECIFICATIONS, AND AS SUPPLEMENTED BY THE COLORADO DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROADWAY AND BRIDGE CONSTRUCTION.

STEEL REINFORCING SHALL BE GRADE 60 FOR ALL REINFORCING STEEL GREATER THAN #4. A TABLE SPECIFYING MINIMUM SPLICE LENGTHS HAS BEEN PROVIDED ON THE STRUCTURAL DETAIL SHEETS.

CAST-IN-PLACE CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH (f_c) OF 4,000 PSI AT 28 DAYS. ALL CONCRETE PLACED AGAINST SOIL SHALL BE TYPE II OR TYPE V PORTLAND CEMENT. ALL EXPOSED CORNERS SHALL BE FORMED WITH A 3/4" CHAMFER UNLESS OTHERWISE SPECIFIED.

EXPANSION JOINT MATERIAL SHALL MEET AASHTO SPECIFICATION M-213.

BACKFILL AGAINST STRUCTURES SHALL NOT COMMENCE UNTIL ALL SUPPORTING DIAPHRAGMS ARE IN PLACE AND CONCRETE HAS OBTAINED ITS FULL SEVEN DAY STRENGTH. BACKFILL SHALL BE PLACED EQUALLY ON EACH SIDE OF RETAINING WALL STRUCTURES AND CUTOFF WALLS UNTIL THE FINAL GRADE IS REACHED.

FOOTING EXCAVATIONS SHALL BE EXAMINED BY THE GEOTECHNICAL ENGINEER WITH A 24-HOUR MINIMUM NOTIFICATION FOR SOIL AND/OR CONCRETE TESTING. PLACEMENT OF CONCRETE IN THE ABSENCE OF TESTING SHALL BE COMPLETED AT THE SOLE RISK OF THE CONTRACTOR.

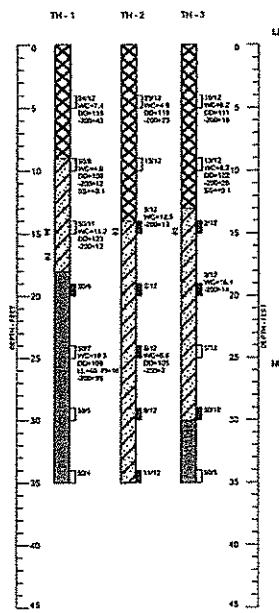
ABBREVIATIONS
 EC --- EPOXY COATED O.F. --- OUTSIDE FACE E.F. --- EACH FACE
 E.W. --- EACH WAY I.F. --- INSIDE FACE N.F. --- NEAR FACE
 T.O.C. --- TOP OF CONCRETE B.O.C. --- BOTTOM OF CONCRETE
 CONT. --- CONTINUOUS

PRIOR TO THE PLACEMENT OF CONCRETE THE SOIL SHALL BE SCARIFIED TO A MINIMUM DEPTH OF 6-INCHES. THE MOISTURE CONTENT SHALL BE ADJUSTED TO WITHIN PLUS OR MINUS 2 PERCENT OF THE OPTIMUM MOISTURE CONTENT AND RECOMPACTED TO AT LEAST 95 PERCENT RELATIVE COMPACTION (AASHTO-T-180).

STRUCTURAL BACKFILL AGAINST CONCRETE STRUCTURES SHALL CONFORM TO THE RECOMMENDED COMPACTION STANDARD SUMMARIZED IN "GEOTECHNICAL INVESTIGATION KING STREET REGIONAL DETENTION FACILITY" PREPARED BY CTL-THOMPSON, INC., PROJECT NO. CS18676-125, FEB. 7, 2017.

GENERAL UTILITY NOTES:

- ALL STORM WORK SHALL COMPLY WITH THE SPECIFICATIONS AND CITY STANDARDS AND SPECIFICATIONS, CURRENT EDITION.
- ALL WATER AND WASTEWATER WORK SHALL COMPLY WITH THE SPRINGS UTILITIES STANDARDS AND SPECIFICATIONS, CURRENT EDITION.
- THE CONTRACTOR AND SURVEY CREW SHALL VERIFY ELEVATIONS OF EXISTING SANITARY SEWER, STORM SEWER, WATER LINES AND MANHOLES TO BE TIED TO PRIOR TO CONSTRUCTION OR STAKING OF PIPE.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR RECORDING AS-BUILT INFORMATION ON A SET OF RECORD DRAWINGS.
- THE CONTRACTOR SHALL CONTACT ALL APPROPRIATE UTILITY COMPANIES, UTILITY DISTRICT AND THE CITY PRIOR TO THE BEGINNING OF ANY CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ANY EXISTING UTILITY (INCLUDING DEPTHS) WHICH ARE WITHIN THE PROPOSED CONSTRUCTION AREA. ALL EXISTING UTILITIES SHALL BE PROTECTED FROM DAMAGE BY THE CONTRACTOR. DAMAGED UTILITIES SHALL BE REPAIRED BY THE CONTRACTOR AT HIS OWN EXPENSE.
- THE LOCATIONS OF EXISTING UTILITIES ARE BASED UPON THE BEST AVAILABLE INFORMATION, ARE SHOWN IN AN APPROXIMATE WAY ONLY, AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UTILITIES.
- PIPE BACKFILLING SHALL NOT OCCUR UNTIL PIPE HAS BEEN INSPECTED.
- BEGIN LAYING PIPE AT THE LOWEST POINT, WITH THE BELLS POINTING UPHILL. LAY THE PIPE IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATIONS AND RECOMMENDATIONS. LAY PIPE TRUE TO LINE AND GRADE AS SHOWN ON THE DWGS.
- ALL STORM SEWER AND SANITARY SEWER PIPE LENGTHS AND SLOPES ARE FIGURED FROM CENTER OF MANHOLE, BEND, WYE AND THE INSIDE WALL OF INLETS. PIPE LENGTHS ARE GIVEN AS A HORIZONTAL LENGTH AND ARE APPROXIMATE. PIPE LENGTHS INCLUDE THE FLARED END SECTION.
- ALL STORM AND SANITARY SEWER PIPE BEDDING TO BE CLASS B BEDDING, UNLESS OTHERWISE NOTED. REFER TO CITY OF COLORADO SPRINGS STANDARD DRAWING D-30 FOR RCP, DWG D-31 FOR BOX CULVERT AND DWG D-32 FOR FLEXIBLE PIPE.
- REFER TO THE SPECIFICATIONS FOR GRANULAR BEDDING MATERIAL REQUIREMENTS FOR THE PIPE BEDDING.
- RCP STORM SEWER PIPE SHALL BE CLASS B, UNLESS OTHERWISE NOTED.
- ALL RCP SECTIONS SHALL BE JOINED IN SUCH A MANNER THAT THE ENDS ARE FULLY ENTERED AND THE INNER SURFACES ARE REASONABLY FLUSH. RUBBER GASKETS SHALL BE USED ON ALL PIPE JOINTS CONFORMING TO ASTM C-433. AVERAGE JOINT GAP THAT EXCEEDS 1/2 INCH SHALL BE FILLED WITH AN APPROVED FLEXIBLE PLASTIC SEALANT.
- CONSTRUCTION AND MATERIALS USED IN ALL STORM MANHOLES SHALL BE PER CITY STANDARDS AND SPECIFICATIONS. ALL MANHOLES SHALL HAVE SHAPED INVERTS.
- MANHOLE RIM ELEVATIONS SHOWN ARE APPROXIMATE ONLY AND ARE NOT TO BE TAKEN AS FINAL ELEVATIONS. RING AND COVER TO BE SET IN CENTERED CONCRETE RINGS WITH RAM-NECK FOR ADJUSTMENT TO MATCH FINAL PAVEMENT ELEV.
- WHERE APPROPRIATE, NEATLY SAW CUT ALL EXISTING CONCRETE AND ASPHALT. THE PLACEMENT OF ADDITIONAL PAVING SHALL BE DONE TO A NEAT WORK LINE, SAW CUTTING A MINIMUM OF ONE (1) FOOT. SAW CUTTING WILL NOT BE PAID FOR SEPARATELY BUT WILL BE CONSIDERED INCIDENTAL TO THE WORK. REPAIR/REPLACE ALL DISTURBED EXISTING ITEMS WITH LIKE MATERIALS AND THICKNESSES. ANY ASPHALT REMOVED IS TO BE REPLACED TO MEET THE SPECIFICATIONS OF THE COLORADO DEPT. OF TRANSPORTATION. EXISTING CONCRETE PAVEMENT SHALL BE SCORED THEN BROKEN AT JOINT TO CREATE A ROUGH SURFACE FOR THE CONSTRUCTION JOINT.
- ALL ASPHALT WORK REQUIRING PATCHING WILL BE PERFORMED TO A NEAT WORK LINE. THE EXISTING ASPHALT SHALL BE SAW CUT. ALL ASPHALT PATCH WORK SHALL BE AT LEAST 2' WIDE AFTER THE COMPLETION OF WORK. NEW CURB CAN BE PLACED FLUSH WITH THE EXISTING ASPHALT IF IT IS TO A NEAT WORK LINE.
- WITH NOTIFICATION OF THE RESPECTIVE OWNER, ADJUST RIMS OF ALL CLEANOUTS, MANHOLES AND VALVE COVERS WITHIN PAVEMENT TO 1/4 TO 1/2 INCH BELOW THE FINISHED GRADE AND CROSS SLOPE PRIOR TO FINAL LIFT PAVING AND ADJUST TO MATCH FINISH GRADE IN UNPAVED AREAS.



- LEGEND:**
- ALL SAND, SILT TO VERY FINE OR CLAYEY, MEDIAN GRADE, MOST CASE LOGS TO NEARLY SPHON.
 - SAND, CLEAN OR SLIGHTLY SILTY TO SILTY, BEST GRADE, COVERED, MOST CASE LOGS TO NEARLY SPHON, SP. SA-SL-SH.
 - FINELY SANDSTONE, CLAYEY TO VERY CLAYEY, OCCASIONAL CLAYEY LENSES, LOGS TO VERY NEARLY SPHON.
 - GRAVE SAND, THE SYMBOLS INDICATED IN BROWS OF A HORIZONTAL NUMBER FALLING 25 INCHES WERE REQUIRED TO OBTAIN A 3 SAMPLES, SAMPLER 18 INCHES.
 - GRAVE SAND, THE SYMBOLS INDICATED IN BROWS OF A HORIZONTAL NUMBER FALLING 25 INCHES WERE REQUIRED TO OBTAIN A 3 SAMPLES, SAMPLER 18 INCHES.
 - CONCRETE LEVEL, MEASURED AT THE END OF DRILLING.
 - PRECONCRETE LEVEL, MEASURED EIGHTY DAYS AFTER DRILLING.
- NOTES:**
- THE BOREHOLES WERE DRILLED JANUARY 12, 2018 USING A 4-INCH DIAMETER, CONTINUOUS-FLOW AUGER AND A DRILL PIPE.
 - THESE LOGS ARE SUBJECT TO THE EXPLANATIONS, LIMITATIONS AND CONCLUSIONS CONTAINED IN THE REPORT.
 - NO - HORIZONTAL MOISTURE CONTENT, (%)
 - NO - HORIZONTAL MOISTURE, (%)
 - NO - HORIZONTAL PLASTICITY INDEX, (%)
 - NO - HORIZONTAL SAND, (%)
 - NO - HORIZONTAL SILT, (%)
 - NO - HORIZONTAL CLAY, (%)
 - NO - HORIZONTAL WATER-SOLUBLE SULFATE CONTENT, (%)

Summary Logs of Exploratory Boreholes

SOIL RIPRAP

THE SOIL MATERIAL SHALL BE NATIVE OR TOPSOIL AND MIXED WITH SIXTY FIVE PERCENT (65%) RIPRAP AND THIRTY FIVE PERCENT (35%) SOIL BY VOLUME.

SOIL RIPRAP SHALL CONSIST OF A UNIFORM MIXTURE OF SOIL AND RIPRAP WITHOUT VOIDS.

CONTRACTOR SHALL COOPERATE WITH ENGINEER IN OBTAINING AND PROVIDING SAMPLES OF ALL SPECIFIED MATERIALS.

CONTRACTOR SHALL SUBMIT CERTIFIED LABORATORY TEST CERTIFICATES FOR ALL ITEMS REQUIRED FOR SOIL RIPRAP.

RIPRAP USED SHALL BE THE TYPE DESIGNATED ON THE DRAWINGS AND SHALL CONFORM TO TABLE SHOWN TO THE RIGHT.

THE RIPRAP DESIGNATION AND TOTAL THICKNESS OF RIPRAP SHALL BE AS SHOWN ON THE DRAWINGS. THE MAXIMUM STONE SIZE SHALL NOT LARGER THAN THE THICKNESS OF THE RIPRAP.

NEITHER WIDTH NOR THICKNESS OF A SINGLE STONE OF RIPRAP SHALL BE LESS THAN ONE-THIRD (1/3) OF ITS LENGTH.

THE SPECIFIC GRAVITY OF THE RIPRAP SHALL BE TWO AND ONE-HALF (2.5) OR GREATER.

MINIMUM DENSITY FOR ACCEPTABLE RIPRAP SHALL BE ONE HUNDRED AND SIXTY FIVE (165) POUNDS PER CUBIC FOOT.

RIPRAP SPECIFIC GRAVITY SHALL BE ACCORDING TO THE BULK-SATURATED, SURFACE-DRY BASIS, IN ACCORDANCE WITH AASHTO T85.

THE RIPRAP SHALL HAVE A PERCENTAGE LOSS OF NOT MORE THAN FORTY PERCENT (40%) AFTER FIVE HUNDRED (500) REVOLUTIONS WHEN TESTED IN ACCORDANCE WITH AASHTO T96.

THE RIPRAP SHALL HAVE A PERCENTAGE LOSS OF NOT MORE THAN TEN (10%) AFTER FIVE (5) CYCLES WHEN TESTED IN ACCORDANCE WITH AASHTO T104 FOR LEDGE ROCK USING SODIUM SULFATE.

THE RIPRAP SHALL HAVE A PERCENTAGE LOSS OF NOT MORE THAN TEN PERCENT (10%) AFTER TWELVE (12) CYCLES OF FREEZING AND THAWING WHEN TESTED IN ACCORDANCE WITH AASHTO T103 FOR LEDGE ROCK, PROCEDURE A. ROCK SHALL BE FREE FROM CALCITE INTRUSIONS.

RUBBLE FOR USE AS SOIL/RIPRAP SHALL BE GRADED TO MEET THE EQUIVALENT ROCK RIPRAP GRADATION. RUBBLE PROPOSED FOR USE IN PLACE OF ROCK RIPRAP SHALL BE STOCKPILED FOR OBSERVATION BY THE ENGINEER PRIOR TO THE COMMENCEMENT OF THE WORK

GRADATION:
 A. EACH LOAD OF RIPRAP SHALL BE REASONABLY WELL GRADED FROM THE SMALLEST TO THE LARGEST SIZE SPECIFIED.
 B. STONES SMALLER THAN THE TWO TO TEN PERCENT (2%-10%) SIZE WILL NOT BE PERMITTED IN AN AMOUNT EXCEEDING TEN PERCENT (10%) BY WEIGHT OF EACH LOAD.
 C. CONTROL OF GRADATION SHALL BE BY VISUAL INSPECTION, HOWEVER IN THE EVENT THE ENGINEER DETERMINES THE RIPRAP TO BE UNACCEPTABLE, THE ENGINEER SHALL PICK TWO (2) RANDOM TRUCKLOADS TO BE DUMPED AND CHECKED FOR GRADATION.

1) MECHANICAL EQUIPMENT AND LABOR NEEDED TO ASSIST IN CHECKING GRADATION SHALL BE PROVIDED BY THE CONTRACTOR AT NO ADDITIONAL COST.

BROKEN ASPHALT PAVEMENT SHALL NOT BE ACCEPTABLE FOR USE IN THE WORK.

ROUNDED RIPRAP (RIVER ROCK) IS NOT ACCEPTABLE, UNLESS SPECIFICALLY DESIGNATED ON THE DRAWINGS.

CLASSIFICATION AND GRADATION OF RIPRAP

RIPRAP DESIGNATION	% SMALLER THAN GIVEN SIZE BY WEIGHT	INTERMEDIATE ROCK DIMENSION (INCHES)	d50* (INCHES)
TYPE VL	70-100	12	6**
	50-70	9	
	35-50	6	
	2-10	2	
TYPE L	70-100	15	9**
	50-70	12	
	35-50	9	
	2-10	3	
TYPE M	70-100	21	12**
	50-70	18	
	35-50	12	
	2-10	4	
TYPE H	100	21	18
	50-70	24	
	35-50	18	
	2-10	6	
TYPE VH	100	42	24
	50-70	33	
	35-50	24	
	2-10	9	

* d50=MEAN PARTICLE SIZE (INTERMEDIATE DIMENSION) BY WEIGHT.
 ** MIX VL, L AND M RIPRAP WITH 35% TOPSOIL (BY VOLUME) AND BURY WITH 4-6 INCHES OF TOPSOIL, ALL VIBRATION COMPACTED & REVEGETATE. (TABLE MD-7: CLASSIFICATION AND GRADATION OF ORDINARY RIPRAP. UDFCD, DRAINAGE CRITERIA MANUAL, VOL. 1)

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Kiowa Engineering Corporation
 1801 South 21st Street
 Colorado Springs, Colorado 80904
 P: 719.576.7242

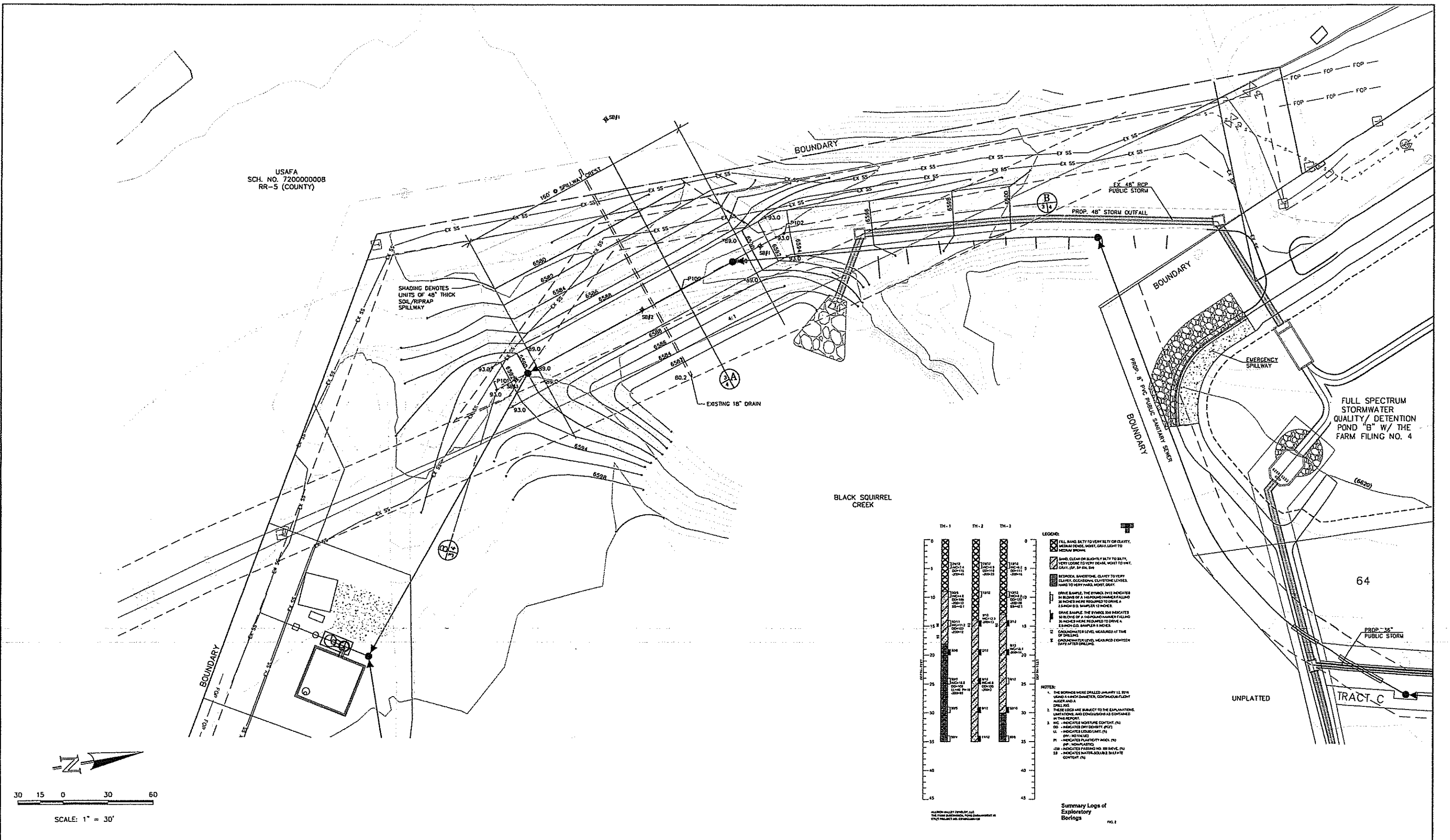
Designer: RNW Date: 7/6/18
 Codd: EAK Date: 7/6/18
 Checker: RNW Date: 7/6/18

PROJECT: BLACK SQUIRREL CREEK LIFT STATION EMBANKMENT DESIGN

NOTES & SUMMARY OF QUANTITIES

DRAINAGE BASIN: BLACK SQUIRREL CREEK

JOB NO. 18017 SHEET 2 OF 8



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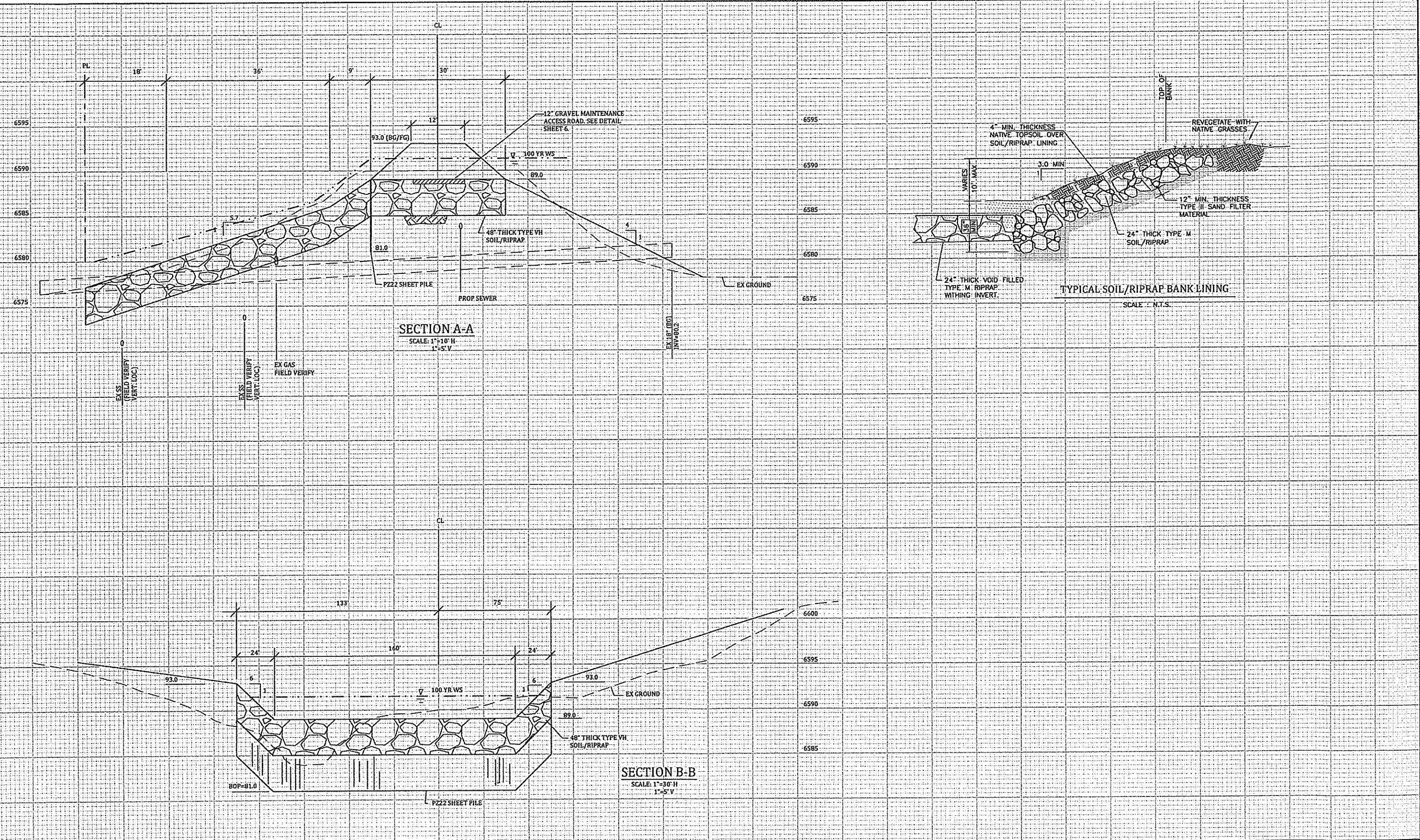
PROJECT: BLACK SQUIRREL CREEK
 LIFT STATION EMBANKMENT DESIGN

SITE LAYOUT

DRAINAGE BASIN: BLACK SQUIRREL CREEK

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SECTION A-A
SCALE: 1"=10' H
1"=5' V

SECTION B-B
SCALE: 1"=30' H
1"=5' V

TYPICAL SOIL/RIPRAP BANK LINING
SCALE: N.T.S.

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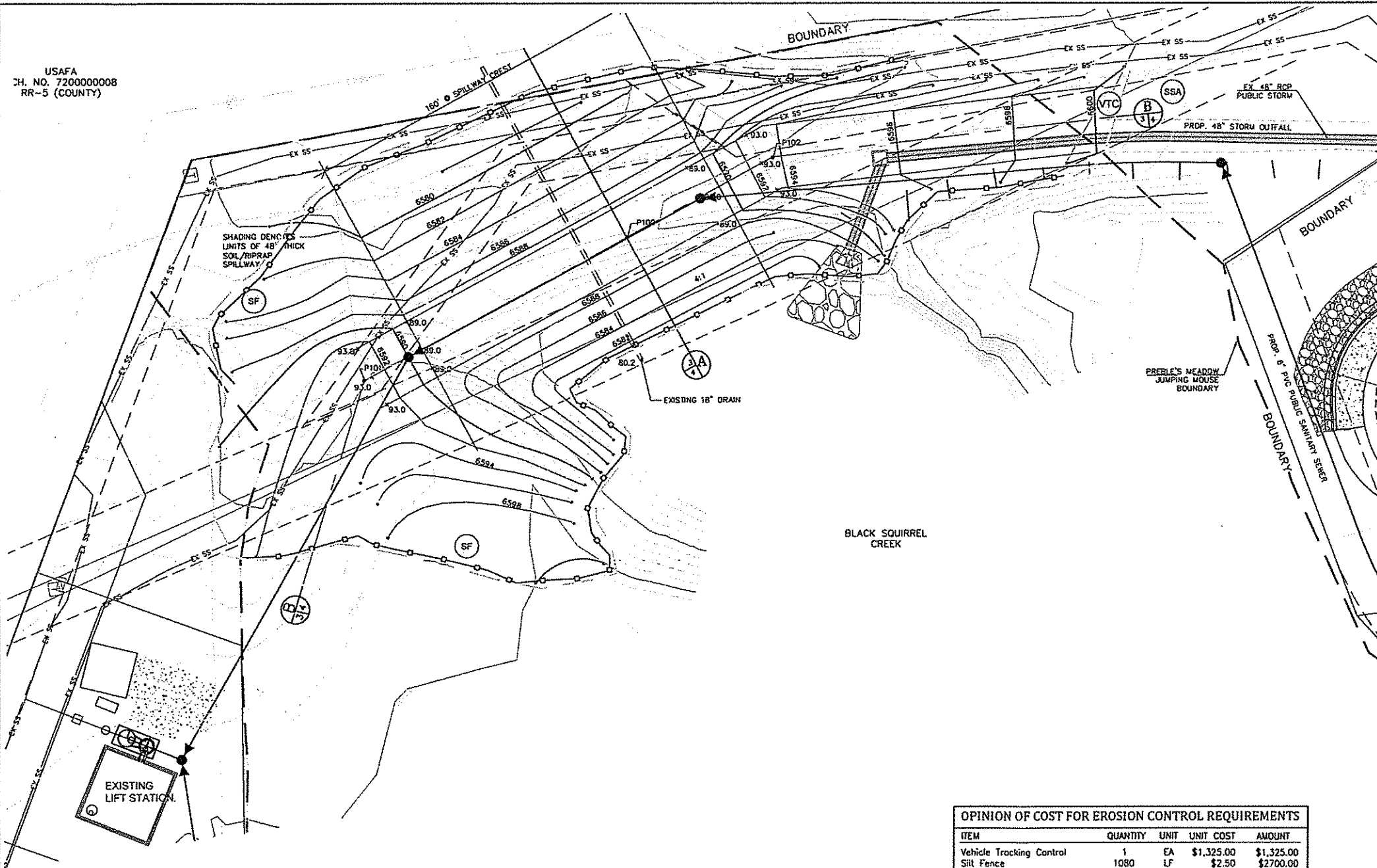
PROJECT: BLACK SQUIRREL CREEK
LIFT STATION EMBANKMENT DESIGN

EMBANKMENT SECTIONS

DRAINAGE BASIN: BLACK SQUIRREL CREEK
JOB NO. 18017 SHEET 4 OF 8

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USAFA
 CH. NO. 720000008
 RR-5 (COUNTY)



- EROSION CONTROL LEGEND**
- LIMITS OF DISTURBANCE
 - - - - - PROPERTY LINE
 - (VTC) VEHICLE TRACKING CONTROL
 - (IP) INLET PROTECTION
 - (SSA) STABILIZED STAGING AREA
 - (SF) SILT FENCE
- NOTES:**
- CONTRACTOR TO IDENTIFY MATERIAL AND SOIL STOCKPILE AREA ON THE SWMP PRIOR TO COMMENCEMENT OF MOBILIZATION.
 - CONTRACTOR TO IDENTIFY LOCATION OF STABILIZED STAGING AREA ON THE SWMP PRIOR TO COMMENCEMENT OF MOBILIZATION.

Standard Grading, Erosion And Stormwater Quality Control Plan Notes

- Any land disturbance by any owner, developer, builder, contractor, or other person shall comply with the Basic Grading, Erosion and Stormwater Quality Control Requirements and General Prohibitions noted in the Drainage Criteria Manual Volume II.
- No clearing, grading, excavation, filling, or other land disturbing activities shall be permitted until sign off and acceptance of the Grading Plan and Erosion and Stormwater Quality Control Plan is received from EDRD.
- The installation of the first level of temporary erosion control facilities and BUP's shall be installed and inspected prior to any earth disturbance operations taking place. Call City Stormwater Inspections, 385-5980, 48 hours prior to construction.
- Sediment (mud and dirt) transported onto a public road, regardless of the size of the site, shall be cleaned immediately.
- Concrete wash water shall not be discharged to or allowed to runoff to State Waters, including any surface or subsurface storm drainage system or facilities.
- Soil erosion control measures for all slopes, channels, ditches, or any disturbed land area shall be completed within twenty-one (21) calendar days after final grading or final earth disturbance has been completed. Disturbed areas and stockpiles which are not of final grade but will remain dormant for longer than thirty (30) days shall also be mulched within twenty-one (21) days after interim grading. An area that is going to remain in an interim state for more than sixty (60) days shall also be seeded. All temporary soil erosion control measures and BUP's shall be maintained until permanent soil erosion control measures are implemented.
- The grading and erosion control plan will be subject to re-review and re-acceptance by EDRD should any of the following occur: grading does not commence within twelve (12) months of the City Engineer's acceptance of the plan, a change in property ownership, proposed development changes, or proposed grading revisions.
- The Plan shall not substantially change the depth of cover, or access existing utility lines. Acceptance of this plan does not constitute approval to grade in any utility easement or right-of-way. Approvals to grade within utility easements must be obtained from the appropriate utility company. It is not permissible for any person to modify the grade of the earth on any Colorado Springs Utilities easement or Utility right-of-way without their written approval. The plan shall not increase or divert water towards utility facilities. Any changes to existing utility facilities to accommodate the plan must be approved by the affected utility owner prior to implementing the plan. The cost to relocate or protect existing utilities or to provide interim access is the applicant's expense.

OPINION OF COST FOR EROSION CONTROL REQUIREMENTS

ITEM	QUANTITY	UNIT	UNIT COST	AMOUNT
Vehicle Tracking Control	1	EA	\$1,325.00	\$1,325.00
Silt Fence	1080	LF	\$2.50	\$2700.00
Stabilized Staging Area	0	SY	\$2.00	\$0.00
Seeding and Mulching	1.3	AC	\$785.00	\$1029.00
			Subtotal	\$5054.00
			Maintenance (40% of E.C.)	\$2022.00
			TOTAL	\$7581.00

Engineer's Statement
 This Erosion and Stormwater Quality Control/Grading Plan was prepared under my direction and supervision and is correct to the best of my knowledge and belief. If such work is performed in accordance with the grading and erosion control plan, the work will not become a hazard to life and limb, endanger property, or adversely affect the safety, use, or stability of a public way, drainage channel, or other property.

Signature: _____ Date: _____
 Printed Name: _____ Seat: _____

Developer's/Owner's Statement
 The owner will comply with the requirements of the Erosion and Stormwater Quality Control Plan including temporary BUP inspection requirements and final stabilization requirements. I acknowledge the responsibility to determine whether the construction activities on these plans require Colorado Discharge Permit System (CDPS) permitting for stormwater discharges associated with Construction Activity.

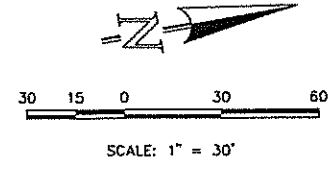
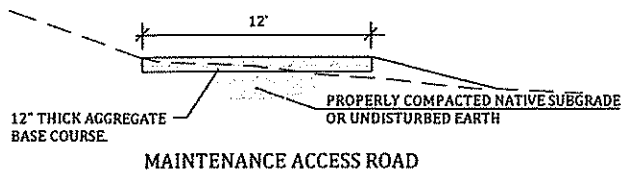
Owner Signature: _____ Date: _____
 Name of Owner: Y _____ Date: _____
 OBA: _____ Phone: 719 _____
 Title: _____ Email: _____
 Address: _____ Fax: _____

City of Colorado Springs Grading and Erosion Control Review
 This grading plan is filed in accordance with section 7.7.1503 (enacted as ord. 02-56) of the code of the City of Colorado Springs, 2001, as amended. Erosion control is reviewed in accordance with the Drainage Criteria Manual, Vol. I (May 2014) and Vol. II (May 2014); latest revisions.

For the City Engineer
 Name: _____ Date: _____

MAINTENANCE TRAIL COORDINATES

POINT #	N	E	DESCRIPTION
100			BEGIN MAINTENANCE TRAIL
102			
102			



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Kiowa Engineering Corporation
 1824 South 51st Street
 Colorado Springs, Colorado 80904
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Designer: RNW Date: 7/6/18
 Cadd: EAK Date: 7/6/18
 Checker: RNW Date: 7/6/18

PROJECT: BLACK SQUIRREL CREEK LIFT STATION EMBANKMENT DESIGN

GRADING AND EROSION CONTROL PLAN

DRAINAGE BASIN: BLACK SQUIRREL CREEK

JOB NO. 18017 SHEET 6 OF 8

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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 BINDWEED, JOHNSON GRASS, Knap 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 REGULATING AGENCY UPON REQUEST.
- DRILL SEEDING MIX SHALL CONFORM TO THE TABLE ON THE RIGHT.
- IF THE SEED AVAILABLE ON THE MARKET DOES NOT MEET THE MINIMUM PURITY AND GERMINATION PERCENTAGES SPECIFIED, THE SUBCONTRACTOR MUST COMPENSATE FOR A LESSE 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 REGULATING AGENCY'S GESC INSPECTOR.
- THE FORMULA USED FOR DETERMINING THE QUANTITY OF PURE LIVE SEED (PLS) SHALL BE (POUNDS OF SEED) X (GERMINATION) X (PURITY) = POUNDS OF PURE LIVE SEED (PLS).
- PERMANENT SEED MIX SHALL BE USED UNLESS OTHERWISE APPROVED BY THE REGULATING AGENCY.
- 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). HAIL ROADS AND OTHER COMPACTED AREAS SHALL BE LOOSENEED TO A DEPTH OF 6 INCHES PRIOR TO SPREADING TOPSOIL.
- SOIL IS TO BE THOROUGHLY LOOSENEED (TILLED) TO A DEPTH OF AT LEAST 6 INCHES PRIOR TO SEEDING. THE TOP 6 INCHES OF THE SEED BED SHALL BE FREE OF ROCKS GREATER THAN 4 INCHES AND SOIL CLODS GREATER THAN 2 INCHES. SEEDING OVER ANY COMPACTED AREAS THAT HAVEN'T 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 10 INCHES OR MORE IN LENGTH. MULCH SHALL BE APPLIED AND MECHANICALLY ANCHORED TO A DEPTH OF AT LEAST 2 INCHES. MULCH SHALL BE APPLIED AT A RATE OF 4000 LB. OF STRAW PER ACRE.
- IF THE PERMITTEE DEMONSTRATES TO THE REGULATING AGENCY 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.
- SEEDING AND MULCHING SHALL BE COMPLETED WITHIN 30 DAYS OF INITIAL EXPOSURE OR 7 DAYS AFTER GRADING IS SUBSTANTIALLY COMPLETE IN A GIVEN AREA (AS DEFINED BY THE REGULATING AGENCY). THIS MAY REQUIRE MULTIPLE MOBILIZATIONS FOR SEEDING AND MULCHING.
- MULCH SHALL BE APPLIED WITHIN 24 HOURS OF SEEDING.
- TACKIFIER SHOULD BE UTILIZED TO HELP WITH STRAW DISPLACEMENT.

SEEDING AND MULCHING MAINTENANCE NOTES

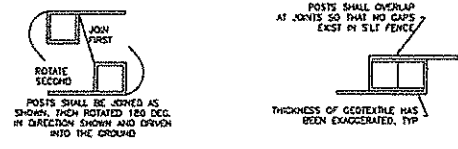
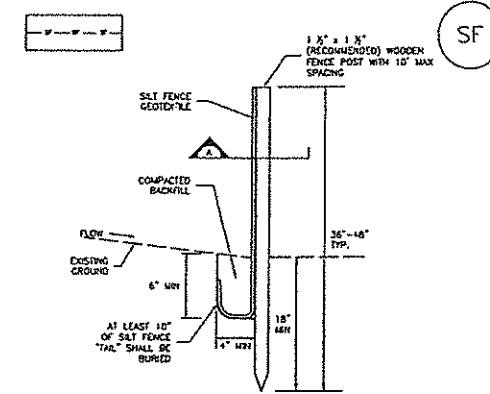
- SEEDED AND MULCHED AREAS SHALL BE INSPECTED FOR REQUIRED COVERAGE MONTHLY FOR A PERIOD OF TWO YEARS FOLLOWING INITIAL SEEDING. REPAIRS AND RE-SEEDING AND MULCHING SHALL BE UNDERTAKEN AFTER THE FIRST GROWING SEASON FOR ANY AREAS FAILING TO MEET THE REQUIRED COVERAGE.
- REQUIRED COVERAGE FOR STANDARD, OPEN SPACE AND LOW GROWTH SEED MIXES SHALL BE DEFINED AS FOLLOWS:
 - THREE (3) PLANTS PER SQUARE FOOT WITH A MINIMUM HEIGHT OF 3 INCHES. THE 3 PLANTS PER SQUARE FOOT SHALL BE OF THE VARIETY AND SPECIES FOUND IN THE DOUGLAS COUNTY-APPROVED MIX.
 - NO BARE AREAS LARGER THAN 4 SQUARE FEET (TWO-FEET BY TWO-FEET OR EQUIVALENT).
 - FREE OF ERODED AREAS.
 - FREE FROM INFESTATION OF NOXIOUS WEEDS IN ACCORDANCE WITH SECTION 6.4 OF THE GESC CRITERIA MANUAL.
- REQUIRED COVERAGE FOR TURF GRASS AREAS SHALL BE DEFINED AS FOLLOWS:
 - AT LEAST 80% VEGETATIVE COVER OF GRASS SPECIES PLANTED.
 - NO BARE AREAS LARGER THAN 4 SQUARE FEET (TWO-FEET BY TWO-FEET OR EQUIVALENT).
 - FREE OF ERODED AREAS.
 - FREE FROM INFESTATION OF NOXIOUS WEEDS IN ACCORDANCE WITH SECTION 6.4 OF THE GESC CRITERIA MANUAL.
- RILL AND GULLY EROSION SHALL BE FILLED WITH TOPSOIL PRIOR TO RESEEDING. THE RESEEDING METHOD SHALL BE APPROVED BY THE COUNTY.

SEED MIX		
AREAS DISTURBED BY THE EARTHWORK SHALL BE PERMANENTLY REVEGETATED WITH NATIVE GRASSES. NATIVE SEED MIX FOR THIS PROJECT SHALL BE AS FOLLOWS:		
SPECIES		DIS/ACRE
SHEEP FESCUE	<i>Festuca ovina</i>	6.6
CANBY BLUEGRASS	<i>Poa canbyi</i>	9.5
THICKSPIKE WHEATGRASS	<i>Elymus lanceolatus</i>	5.7
WESTERN WHEATGRASS	<i>Pascopyrum smithii</i>	7.9
BLUE GRAMA	<i>Chorizanum gracilis</i>	11
SVITCH GRASS	<i>Panicum virgatum</i>	10
SIDE-OATS GRAMA	<i>Boutelou curtipendula</i>	2.0
ANNUAL RYE	<i>Lolium multiflorum</i>	10.0
		28.7 lbs
SEEDING APPLICATION: DRILL SEED 1/4" TO 1/2" INTO TOPSOIL. IN AREAS INACCESSIBLE TO A DRILL, HAND BROADCAST AT DOUBLE THE RATE AND RAKE 1/4" TO 1/2" INTO THE TOPSOIL.		
MULCHING APPLICATION: 1-1/2 TONS NATIVE HAY PER ACRE, MECHANICALLY CRIMPED INTO THE TOPSOIL OR HYDRAMULCH.		

SEEDING AND MULCH  

Silt Fence (SF)

SC-1



SILT FENCE

SECTION A

SF-1. SILT FENCE

SC-1

Silt Fence (SF)

- SILT FENCE INSTALLATION NOTES**
- SILT FENCE MUST BE PLACED AWAY FROM THE TOE OF THE SLOPE TO ALLOW FOR WATER FLOW. SILT FENCE AT THE TOE OF A SLOPE SHOULD BE INSTALLED IN A FLAT LOCATION AT LEAST SEVERAL FEET (2-5 FT) FROM THE TOE OF THE SLOPE TO ALLOW ROOM FOR POINTS AND DEPOSITION.
 - A UNIFORM 6" X 4" ANCHOR TRENCH SHALL BE EXCAVATED USING TRENCH DIRT SILT FENCE INSTALLATION DEVICE, NO ROAD GRADER, BACKHOES, OR SIMILAR EQUIPMENT SHALL BE USED.
 - COMPACT ANCHOR TRENCH BY HAND WITH A "JUMPING JACK" OR BY WHEEL ROLLING. EQUIPMENT SHALL BE SURE THAT SILT FENCE REMAINS BEING PULLED OUT OF ANCHOR TRENCH BY HAND.
 - SILT FENCE SHALL BE PULLED TIGHT AS IT IS ANCHORED TO THE STAKES THERE SHOULD BE NO NOTICEABLE SAG BETWEEN STAKES AFTER IT HAS BEEN ANCHORED TO THE STAKES.
 - SILT FENCE FABRIC SHALL BE ANCHORED TO THE STAKES USING 1" HEAVY DUTY STAPLES OR NAILS WITH 1" HEADS. STAPLES AND NAILS SHOULD BE PLACED 3" ALONG THE FABRIC DOWN THE STAKE.
 - AT THE END OF A RUN OF SILT FENCE ALONG A CONTOUR, THE SILT FENCE SHOULD BE TURNED PERPENDICULAR TO THE CONTOUR TO CREATE A "J-HOOK". THE "J-HOOK" EXTENDING PERPENDICULAR TO THE CONTOUR SHOULD BE OF SUFFICIENT LENGTH TO KEEP RUNOFF FROM FLOWING AROUND THE END OF THE SILT FENCE. (TYPICALLY 10' - 20').
 - SILT FENCE SHALL BE INSTALLED FROM TO ANY LAND DISTURBING ACTIVITIES.
- SILT FENCE MAINTENANCE NOTES**
- INSPECT BMPs EACH WEEKEND, 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.
 - WHEN BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.
 - SEDIMENT ACCUMULATED UPSTREAM OF THE SILT FENCE SHALL BE REMOVED AS NEEDED TO MAINTAIN THE FUNCTIONALITY OF THE BMP. TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY 6".
 - REPAIR OR REPLACE SILT FENCE WHEN THERE ARE SIGNS OF WEAR, SUCH AS SAGGING, TEARING, OR COLLAPSE.
 - SILT FENCE IS TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION, OR IS REPLACED BY AN EQUIVALENT PERIMETER SEDIMENT CONTROL BMP.
 - WHEN SILT FENCE IS REMOVED, ALL DISTURBED AREAS SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION.
- DETAILS ADAPTED FROM TOWN OF ANKER, COLORADO AND CITY OF ALABAMA, NOT AVAILABLE IN ANKER.
- NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UNITED STATES MODEL DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

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1024 South 21st Street
Colorado Springs, Colorado 80904
(719) 525-7542

PROJECT: BLACK SQUIRREL CREEK LIFT STATION EMBANKMENT DESIGN

EROSION CONTROL DETAILS

DRAINAGE BASIN: BLACK SQUIRREL CREEK

JOB NO. 18017 SHEET 7 OF 8

