

STORMWATER MANAGEMENT PLAN

For the

WOODMEN HILLS METROPOLITAN DISTRICT

Lift Station #1 Replacement

November 2018

Prepared By:



CONSULTANTS, INC.

STORMWATER MANAGEMENT PLAN
Woodmen Hills Metropolitan District
Lift Station #1 Replacement

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CONTACT INFORMATION

Applicant/Owner Information

Name: Woodmen Hills Metropolitan District
Address: 8046 Eastonville Rd, Peyton, CO 80831
Contact: Jerry Jacobson, District Manager
Telephone: 719-495-2500

Prepared by

Name: JDS-Hydro Consultants, Inc.
Address: 545 E. Pikes Peak Ave., Ste. 300, Colorado Springs, CO 80903
Contact: Ryan Mangino, P.E.
Telephone: 719-227-0072 ext. 103
Email: rmangino@jdshydro.com

Designated Operator

Name: Woodmen Hills Metropolitan District
Address: 8046 Eastonville Rd, Peyton, CO 80831
Contact: Jerry Jacobson, Operator in Responsible Charge
Telephone: 719-495-2500

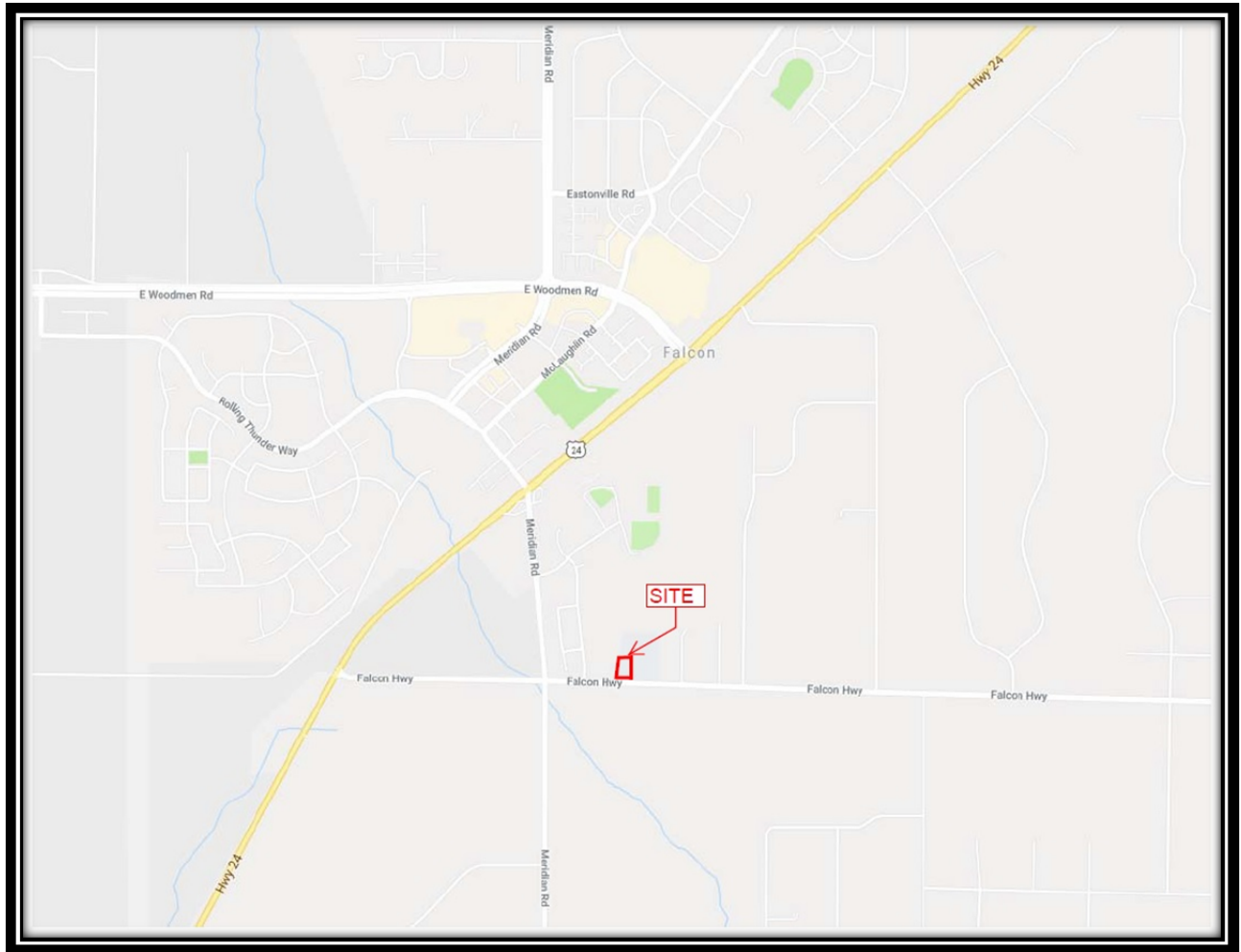
Contractor

Name: TBD
Address: TBD
Contact: TBD
Telephone: TBD

1.0 SITE LOCATION AND DESCRIPTION

1.1 Site Location

The subject facility is a proposed wastewater pump station (lift station) to replace an existing lift station on the same site. The existing and replacement lift stations are owned and operated by the Woodmen Hills Metropolitan District. The site is located approximately 14 miles north east of downtown Colorado Springs in Falcon, CO, approximately 0.8 miles south of the Woodmen Road/Hwy 24 intersection. The vicinity map below shows the site location:



1.2 Description of Construction

The proposed replacement lift station includes below-grade concrete structures, process pumps and piping, and an above-grade building housing electrical and control equipment. Additionally, onsite parking and driveways will be constructed from aggregate base.

1.3 Steps for Construction

- Erosion Control BMP's
- Mobilization

- Construction Staking
- Excavation
- Concrete forming and placement
- Backfill and grading
- Utility installation
- Building erection
- Process piping
- Interior building finish
- Final grading and revegetation

1.4 Estimates of Excavation

The total acreage of disturbed land for the construction of the facility is approximately 0.96 acres. All disturbance and grading will take place on the existing lift station site, as well as within a temporary construction easement granted by the neighboring elementary school.

Cut – 1,109 cu. yds.

Fill – 964 (*1.15 for fluff) = 1,109 cu. yds. _____

Net – 0 cu. yds. Cut/Fill

1.5 Drainage Characteristics

The site borders Falcon Highway to the south and a drainage way owned by the El Paso County Parks Department to the west.

Existing drainage sheet-flows to the south and west into the drainage way mentioned above. There are no existing drainage facilities (storm pipes, inlets, culverts, etc.) on the site.

Most of the site drains directly to the drainage way to the west, while a small portion drains into a roadside ditch on the north side of Falcon Highway, and eventually west into the drainage way.

Proposed drainage will generally remain the same as the existing drainage. The addition of an above-grade building will add 756 square-feet of new impervious area to the site. However, detention facilities are not proposed for this project.

In order to offset the additional impervious area and avoid detention facilities, installation of permeable material is proposed around the building in lieu of the typical gravel driveway.

The permeable material will consist of over 3,300 square feet of 5-inch thick gravel, and a 1-inch “permeable paver” with 3/8-inch gravel at finished grade. This system will allow storm water to infiltrate almost immediately and filter into the soils beneath instead of flowing immediately offsite. The volume of the permeable material at an assumed 40% void ratio is roughly 4,500 gallons, or 1,500 cubic feet.

There are multiple reasons that detention is not desired for this project, including:

- Lack of area
 - The lift station and buried infrastructure take up most of the site
- Proximity to existing drainage way, 100-year floodplain, and wetlands
 - A detention pond serving the facility would have to be constructed in existing floodplain and wetlands, disturbing the wetlands and potentially impacting existing floodplain elevations.

1.6 Soils Description

Soils near the surface of the site are mostly clayey to very clayey sands underlain by interbedded layers of sandstone and claystone bedrock. Sandstone bedrock underlays the surface soils and was encountered between 7 and 10 feet below existing grade. The soils are generally very permeable due to the relatively high sand content. *Appendix B* contains a geotechnical Soils Report for the project area.

None of the existing or proposed slopes will be 3H:1V or steeper.

1.7 Vegetation

Existing vegetation consists primarily of sparse native grasses (~50% ground cover).

1.8 Pollutants

During construction, the largest possible source of non-storm water pollution would be leakage of oils and other fluids from construction equipment and vehicles. Refueling of equipment will occur within the staging area.

The contractor will also be responsible for cleanup of any off-site vehicle tracking on paved roads. No other sources of pollution such as vehicle washing, chemical storage or waste disposal are anticipated. Portable restroom facilities will be used by the construction crew during the construction phase.

The contractor shall be responsible for any spill cleanup from construction equipment, in accordance with applicable local, county, and state regulations.

1.9 Discharge

Dewatering will be necessary for the excavation. The contractor shall obtain a Construction Dewatering Permit from CDPHE and shall comply with all conditions of that permit.

1.10 Receiving Waters

Drainage generally flows northeast to southwest into an adjacent drainage way, also being an unnamed tributary to Black Squirrel Creek. There are no existing drainage facilities (storm pipes, inlets, culverts, etc.) on the site.

A very small portion of the site is located within the 100-Year floodplain. However, no grading or improvements are proposed within the floodplain.

2.0 EROSION CONTROL PLAN

This Stormwater Management Plan contains a Grading & Erosion Control Plan in *Appendix D* and should be used in conjunction with the design drawings. There will be no anticipated storage of wastes, nor will there be any asphalt or concrete batch plants located on the site. Location of erosion control facilities are shown on the plans.

3.0 BEST MANAGEMENT PRACTICES

3.1 Erosion and Sediment Controls

All erosion and sediment control will be installed immediately before any excavation. Silt fencing will be placed at areas shown on the construction drawings.

Non-structure practices to control erosion and sedimentation will incorporate reseeding of ground cover in disturbed areas in accordance with the project specifications as soon as possible, or at least during the same season. Additional methods will include brooms and shovels to relocate small amounts of soil erosion.

3.2 Material Handling and Spill Prevention

The most probable sources of non-storm water pollution are daily maintenance operations. If mobile fuel trucks are used to service equipment, absorbent materials and containers for the storage of used absorbent material will be nearby. Place debris, overburden, soil stockpiles and waste materials away from areas of runoff.

3.3 Final Stabilization and Long-Term Storm Water Management

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 at final grade, but will remain dormant for longer than 30 days, shall also be mulched within 21 days after interim grading. An area that is going to remain in an interim state for more than 60 days shall also be seeded. All temporary soil erosion control measures and BMPs shall be maintained until permanent soil erosion control measures are implemented.

Vegetative cover density shall be a minimum of seventy percent (70%) of pre-disturbed levels to be considered stabilized.

3.4 Other Controls

There are several Best Management Practices than can be employed to prevent or mitigate the source of pollutants and contamination of storm water runoff. Some of these are:

- All refuse dumpsters and receptacles shall be equipped with functional lids to prevent rain and snow from entering. Lids must be closed when dumpsters and receptacles are not actively in use.
- Storage containers, drums, and bags shall be stored away from direct traffic routes to prevent accidental spills. Ensure packages and containers are intact.
- Empty drums shall be covered to prevent collection of precipitation.
- Containers shall be stored on pallets to prevent corrosion of containers, which can result when containers come in contact with moisture on the ground.
- Regularly scheduled removal of construction trash and debris.
- Tracking control must be implemented by the contractor to prevent unnecessary soil from entering paved surfaces. The measures to be used will be preventing equipment in the construction area from moving off-site. If the contractor cannot do this, then a vehicle tracking pad will be required according to El Paso County specifications. Brooms and shovels may be required for tracking control.

The contractor is certainly not limited to these measures which may require adjusting the BMP's as the project progresses and implement further controls as prudence and good judgment deem necessary.

3.5 Inspection and Maintenance

A thorough inspection of the storm water management system shall be performed every 14 days as well as after any rain or snowmelt event that causes surface erosion.

- Erosion of side slopes shall be repaired.
- Silt fences shall be cleaned whenever sediment has reached a depth of six (6) inches at the fence, and broken wooden parts or torn fabric shall be repaired or replaced.
- Any accumulated trash or debris shall be removed from these protected areas.
- In the case where additional BMP's are required in areas later determined as a risk but not included in the drawings, contractor will be required to install BMP's at these locations. These areas may include: excavated dirt piles, protection of existing drainage systems, and roadway drainage.

An Inspection and Maintenance Log is attached to this Storm Water Management Plan.

A copy of this SWMP is to be located at all times with the Foreman/Superintendent responsible for maintaining conditions set forth in this document. Said copy should be contained in a lockbox in the "Staging/Stockpile Area" noted on the plans.

This SWMP shall be revised by informing Engineer of deviations to original plan. Engineer will then update this report and all applicable drawings, forms, tables, etc... as deemed necessary.

**WOODMEN HILLS METROPOLITAN DISTRICT
LIFT STATION #1 REPLACEMENT
STORM WATER MANAGEMENT PLAN
INSPECTION AND MAINTENANCE LOG**

[illegible]

APPENDIX A

EROSION AND STORMWATER QUALITY CONTROL PERMIT (ESQCP)

EL PASO COUNTY DEPARTMENT OF TRANSPORTATION

APPLICATION AND PERMIT

PERMIT NUMBER _ESQ-17-021 _____

APPLICANT INFORMATION

Applicant Contact Information	
Owner	Woodmen Hills Metropolitan District
Name (person of responsibility)	Jerry Jacobson
Company/Agency	Woodmen Hills Metropolitan District
Position of Applicant	District Manager
Address (physical address, not PO Box)	8046 Eastonville Road
City	Peyton
State	Colorado
Zip Code	80831
Mailing address, if different from above	N/A
Telephone	719-495-2500
FAX number	719-495-1344
Email Address	Jerry@whmd.org
Cellular Phone number	

CONTRACTOR INFORMATION

Contractor	
Name (person of responsibility)	TBD
Company	TBD
Address (physical address, not PO Box)	TBD
City	TBD
State	TBD
Zip Code	TBD
Mailing address, if different from above	N/A
Telephone	TBD
FAX number	TBD
Email Address	TBD
Cellular Phone number	N/A
Erosion Control Supervisor (ECS)*	N/A
ECS Phone number*	N/A
ECS Cellular Phone number*	N/A

*Required for El Paso County Department of Transportation Projects. Recommended for others.

PROJECT INFORMATION

Project Specifications	
Project Name	WHMD Lift Station #1 Replacement
Legal Description	<p>(BEARINGS ARE BASED ON A SOUTHEAST LINE OF TRACT "C", FALCON VISTA SUBDIVISION AS BEARING N08°19'14E)</p> <p>A tract of land located in the Southwest 1/4 of Section 7, Township 13 South, Range 64 West of the 6TH Principle Meridian, El Paso County, Colorado, described as follows:</p> <p>BEGINNING at the Southeast Corner of Tract C, Falcon Vista Subdivision, a subdivision recorded under reception number 201077380 of the records of El Paso County, Colorado;</p> <p>Thence N08°19'14"E, 164.17 feet along a southeast line of said Tract C; Thence N89°55'51"E, 76.44 feet; Thence S00°04'09"E, 119.27 feet; Thence S08°40'36"W, 46.83 feet; Thence N88°08'16"W, 93.33 feet to the TRUE POINT OF BEGINNING.</p> <p>AREA = 14,365 Sq. ft. more or less</p>
Address (or nearest major cross streets)	TBD Falcon Highway and Meridian Road
Acreage (total and disturbed)	39.37-Acre Tract 0.33-Acre Easement (Site) 0.95 Acres Disturbed
Schedule	Construction Start: Spring 2019 Construction Completion: Fall 2019
Project Purpose	The purpose of the project is to replace a failing lift station with a new facility of the same capacity on the same site. This lift station serves existing schools, residents, and businesses, and sends wastewater to the WHMD Regional Water Reclamation Facility.
Description of Project	The proposed replacement lift station includes below-grade concrete structures, process pumps and piping, and an above-grade building housing electrical and control equipment.
Tax Schedule Number	4307300006

FOR OFFICE USE ONLY

The following signature from the ECM Administrator signifies the approval of this ESQCP. All work shall be performed in accordance with the permit, the El Paso County Engineering Criteria Manual (ECM) Standards, City of Colorado Springs Drainage Criteria Manual, Volume 2 (DCM2) as adopted by El Paso County Addendum, approved plans, and any attached conditions. The approved plans are an enforceable part of the ESQCP. Construction activity, except for the installation of initial construction BMPs is not permitted until issuance of a Construction permit and Notice to Proceed.

Signature of ECM Administrator: _____ Date _____

1.1 REQUIRED SUBMISSIONS

In addition to this completed and signed application, the following items must be submitted to obtain an ESQCP:

- Permit fees
- Stormwater Management Plan (SWMP) meeting the requirements of DCM2 and ECM either as part of the plan set or as a separate document;
- Cost estimates of construction and maintenance of construction and permanent stormwater control measures (Cost estimates shall be provided on a unit cost basis for all stormwater BMPs);
- Financial surety in an amount agreeable to the ECM Administrator based on the cost estimates of the stormwater quality protection measures provided. The financial surety shall be provided in the form of a Letter of Credit, Surety with a Bonding Company, or other forms acceptable to El Paso County;
- Operation and Maintenance Plan for any proposed permanent BMPs; and
- Signed Private Stormwater Quality Structural Best Management Practices Agreement and Easement, if any private permanent BMPs are proposed.

1.2 RESPONSIBILITY FOR DAMAGE

The County and its officers and employees, including but not limited to the ECM Administrator, shall not be answerable or accountable in any manner, for injury to or death of any person, including but not limited to a permit holder, persons employed by the permit holder, persons acting in behalf of the permit holder, or for damage to property resulting from any activities undertaken by a permit holder or under the direction of a permit holder. The permit holder shall be responsible for any liability imposed by law and for injuries to or death of any person, including but not limited to the permit holder, persons employed by the permit holder, persons acting in behalf of the permit holder, or damage to property arising out of work or other activity permitted and done by the permit holder under a permit, or arising out of the failure on the permit holder's part to perform the obligations under any permit in respect to maintenance or any other obligations, or resulting from defects or obstructions, or from any cause whatsoever during the progress of the work, or other activity, or at any subsequent time work or other activity is being performed under the obligations provided by and contemplated by the permit.

To the extent allowed by law, the permit holder shall indemnify, save, and hold harmless the County and its officers and employees, including but not limited to the BOCC and ECM Administrator, from all claims, suits or actions of every name, kind and description brought for or on account of injuries to or death of any person, including but not limited to the permit holder, persons employed by the permit holder, persons acting in behalf of the permit holder and the public, or damage to property resulting from the performance of work or other activity under the permit, or arising out of the failure on the permit holder's part to perform his obligations under any permit in respect to maintenance or any other obligations, or resulting from defects or obstructions, or from any cause whatsoever during the progress of the work, or other activity or at any subsequent time work or other activity is being performed under the obligations provided by and contemplated by the permit, except as otherwise provided by state law. The permit holder waives any and all rights to any type of expressed or implied indemnity against the County, its officers or employees.

1.3 APPLICATION CERTIFICATION

I, as the Applicant or the representative of the Applicant, hereby certify that this application is correct and complete as per the requirements presented in this application and the El Paso County Engineering Criteria Manual and Drainage Criteria Manual, Volume 2 and El Paso County Addendum.

I, as the Applicant or the representative of the Applicant, have read and will comply with all of the requirements of the specified Stormwater Management Plan and any other documents specifying stormwater best management practices to be used on the site including permit conditions that may be required by the ECM Administrator. I understand that the Best Management Practices are to be maintained on the site and revised as necessary to protect stormwater quality as the project progresses. I further understand that a Construction Permit must be obtained and all necessary stormwater quality control BMPs are to be installed in accordance with the SWMP and the El Paso County Engineering Criteria Manual and Drainage Criteria Manual, Volume 2 and El Paso County Addendum before land disturbance begins and that failure to comply will result in a Stop Work Order and may result in other penalties as allowed by law. I further understand and agree to indemnify, save, and hold harmless the County and its officers and employees, including but not limited to the BOCC and ECM Administrator, from all claims, suits or actions of every name, kind and description as outlined in Section 1.2 Responsibility for Damage.



Date: 11/19/18

 Signature of Applicant or Representative

 Ryan Mangino

 Print Name of Applicant or Representative

Permit Fee

Surcharge

Financial Surety _____ Type of Surety _____

Total \$ _____

APPENDIX B

**GEOTECHNICAL INVESTIGATION
LIFT STATION
FALCON HWY., EAST OF MERIDIAN RD.
FALCON, COLORADO**

Prepared For:

WOODMEN HILLS METROPOLITAN DISTRICT
c/o JDS-Hydro Consultants, Inc.
545 East Pikes Peak Avenue, Suite 300
Colorado Springs, Colorado 80903

Attention: Ryan Mangino, P. E.

CTL|T Project No. CS18474-125

September 29, 2015
Revised: September 5, 2018

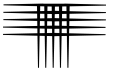


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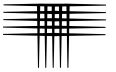
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FIG. 1 – LOCATION OF EXPLORATORY BORINGS

FIG. 2 – SUMMARY LOG OF EXPLORATORY BORINGS

FIGS. 3 & 4 – SWELL CONSOLIDATION TEST RESULTS

TABLE 1 – SUMMARY OF LABORATORY TESTING



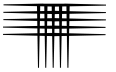
SCOPE

This report presents the results of our revised Geotechnical Investigation for the proposed lift station to be constructed in Falcon, Colorado (Fig. 1). The purpose of our investigation was to evaluate the subsurface conditions in order to provide geotechnical recommendations and criteria for design and construction of the structure foundation and below-grade walls, as well as surface drainage precautions. The scope of our services was described in our proposal (CS-15-0099) dated August 20, 2015. Evaluation of the property for the possible presence of potentially hazardous materials (Environmental Site Assessment) was beyond the scope of this investigation.

This report was prepared from data developed during our field exploration, laboratory testing, engineering analysis, and our experience. The design criteria presented in the report were based on our understanding of the planned construction. If changes occur, we should review the revised plans to determine their effect on our recommendations. The following section summarizes the report. More detailed descriptions of subsurface conditions, as well as our design and construction recommendations, are presented in the report.

SUMMARY

1. Subsurface conditions encountered in our exploratory borings consisted of 3 to 10 feet of clayey to very clayey sand underlain by interbedded layers of sandstone and claystone bedrock.
2. At the time of drilling, groundwater was encountered in both of the borings at depths of 7 and 26 feet below the existing ground surface. When groundwater levels were rechecked one day after the completion of drilling operations, water was again found in both of the borings at depths of 4 and 5 feet. Groundwater levels will fluctuate with seasonal precipitation.
3. A sophisticated dewatering system, such as well points and a sheet piling wall, or a slurry wall cutoff trench will probably be necessary to accomplish excavation and construction to the depth below the groundwater level that is anticipated.



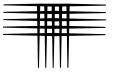
4. We believe the proposed lift station can be constructed on a reinforced concrete mat underlain by the sandstone and claystone bedrock. The design will need to consider lateral earth pressures acting on the below-grade walls and possible buoyant forces resulting from the shallow groundwater.
5. Surface drainage should be designed, constructed, and maintained to provide rapid removal of runoff away from the proposed structure.

SITE CONDITIONS

The proposed lift station is to be constructed at the site of an existing lift station situated on the Falcon Highway, east of Meridian Road, in Falcon, Colorado. The general vicinity of the facility is shown in Fig. 1. Falcon Elementary School occupies the land to the east of the lift station. The land to the west is undeveloped. The ground surface at the site is comparatively flat and level. A shallow detention pond is present near the center of the property. The pond was dry at the time of our field investigation. Structures and equipment associated with the existing lift station are present along the southeast edge of the site. Vegetation on the property consists of grasses and weeds.

PROPOSED CONSTRUCTION

We understand the proposed lift station will include a cast-in-place concrete dry well that extends about 25 to 30 feet below the existing ground surface. This structure will be constructed to replace the existing lift station. The dry well will contain pumping equipment, piping, and valves. A one-story, wood-frame equipment building will be constructed over the top of the dry well. Foundation loads are expected to be light. We have seen no specific plans or details for the construction of the lift station.



SITE GEOLOGY

Published geologic mapping ("Falcon Quadrangle Geologic Map, El Paso County, Colorado," Matthew L. Morgan and Jonathan L. White, Colorado Geological Survey, 2012) indicates the site is underlain locally by alluvial deposits (Upper Holocene; Qa1) that consist of sands, gravels, silts and minor clays. The near-surface soils are underlain by bedrock of the Black Squirrel Formation (Paleocene; Tbs). Conditions encountered in our borings generally confirm the mapping.

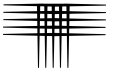
INVESTIGATION

Our field investigation included drilling two exploratory borings at the requested locations. The borings were advanced to a depth of 35 feet using 4-inch diameter, continuous-flight, solid-stem auger and a truck-mounted drill rig. Drilling was observed by our field representative who logged the conditions found in the borings and obtained samples. Summary logs of the borings, results of field penetration resistance tests, and laboratory test data are presented in Fig. 2.

Soil and bedrock samples obtained during drilling were returned to our laboratory and visually classified. Laboratory testing was then assigned to representative samples and included moisture content and dry density, swell-consolidation, sieve analysis (passing the No. 200 sieve), and water-soluble sulfate concentration tests. The swell test samples were wetted under applied loads that approximated the overburden pressure (the weight of overlying soil). Results of the swell-consolidation tests are presented in Figs. 3 and 4. Laboratory test data are summarized in Table 1.

SUBSURFACE CONDITIONS

Subsurface conditions encountered in our exploratory borings consisted of clayey to very clayey sand underlain by interbedded layers of sandstone and claystone bedrock. Some of the pertinent engineering characteristics of the soils



and bedrock encountered, as well as groundwater conditions, are described in the following paragraphs.

Natural Sand

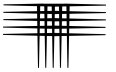
Natural, clayey to very clayey sand was encountered in both of the borings at the ground surface. The sand layer was about 3 to 10 feet thick. The sand was medium dense based on the results of field penetration resistance tests. A sample of the sand tested in our laboratory contained 34 percent silt and clay-sized particles (passing the No. 200 sieve). Our experience indicates the clayey to very clayey sand typically exhibits low to moderate measured swells when wetted.

Bedrock

Interbedded layers of sandy claystone and clayey to very clayey sandstone bedrock were found in both of the borings, below the natural sand soils. In boring TH-1, the initial 4 feet of the bedrock formation were severely weathered. The bedrock was medium hard to very hard, but generally poorly cemented. Two samples of the claystone tested in our laboratory swelled 3.9 and 5.4 percent when wetted under overburden pressure. Two other samples of the claystone contained 76 and 85 percent silt and clay-sized particles (passing the No. 200 sieve).

Groundwater

At the time of drilling, groundwater was encountered in both of the borings at depths of 7 and 26 feet below the existing ground surface. When groundwater levels were rechecked one day after the completion of drilling operations, water was again found in both of the borings at depths of 4 and 5 feet. We believe groundwater is perched above the bedrock in the sand soils and likely occurs within the sandstone bedrock. Groundwater levels will fluctuate with seasonal precipitation.



Seismicity

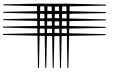
This area, like most of central Colorado, is subject to a degree of seismic activity. We believe the soils on the property classify as Site Class C (dense soil and soft rock profile) according to the 2015 International Building Code (2015 IBC).

EXCAVATION

We understand an excavation depth of about 25 to 30 feet will be required for construction of the proposed lift station dry well. The surficial sands are medium dense and the underlying claystone and sandstone are medium hard to very hard. We anticipate the near-surface soils and underlying bedrock can be excavated using conventional, heavy-duty equipment, above the groundwater level. We expect the sand soils and bedrock will classify as Type C and Type B materials, respectively, using Occupational Safety and Health Administration (OSHA) criteria. OSHA requires temporary construction slopes be no steeper than 1.5:1 (horizontal to vertical) for Type C soils and 1:1 for Type B materials. We believe these slope configurations are applicable in the absence of active seepage.

The sands will likely flow into excavations made below the groundwater surface. Based on our understanding of the planned lift station and conditions encountered in our borings, the excavation is expected to extend about 20 to 25 feet below the groundwater level and bottom in the claystone and sandstone bedrock. The shoring system for the excavation will need to be designed by a professional engineer and account for the locations of existing and planned facilities.

In our opinion, dewatering using local sump pits and pumps will not be effective during construction because of the depth of excavation below the groundwater surface. A more sophisticated dewatering system such as well points and a sheet piling wall, or a slurry wall cutoff trench will likely be needed to accomplish excavation and construction to the depth that is anticipated. Construction docu-



ments should reflect that the contractor will need to employ sophisticated dewatering techniques. The dewatering system will need to account for potential influences on surrounding, off-site water wells, if present.

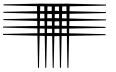
DRY WELL FOUNDATION

We anticipate the proposed dry well associated with the lift station will be a cast-in-place, concrete structure. We believe the dry well can be constructed on a monolithically-placed, reinforced concrete mat foundation underlain by the claystone and sandstone bedrock. We recommend the concrete mat be designed for a maximum allowable soil pressure of 3,000 psf. Soils loosened or disturbed during excavation or the forming process should be removed before placing the mat. The completed excavation should be observed by a representative of our firm to verify the exposed conditions are as expected.

The dry well will likely be subjected to uplift forces resulting from hydrostatic pressure. The dry well should be designed and constructed as a watertight structure capable of resisting the buoyant forces. We recommend a design moist density for overlying backfill of 125 pounds per cubic foot (pcf) for backfill used to “weight” the structure. Backfill that is under water will be buoyant, reducing its effective density by the unit weight of water to about 60 pcf.

BELOW-GRADE CONSTRUCTION

We anticipate the below-grade walls of the dry well will retain about 25 to 30 feet of backfill. The walls will be fixed and unable to rotate. We recommend the walls be backfilled with the on-site, clayey sand and sandstone that has been mechanically broken down to have a maximum particle size of 2 inches, or a similar granular material. We recommend excluding the use of the claystone for wall backfill. The backfill should be moisture conditioned to near optimum and compacted in thin lifts to at least 98 percent of maximum standard Proctor dry density (ASTM D 698). For level granular backfill compacted as specified, we recommend the dry well walls be designed to resist an “at-rest” earth pressure condition corre-



sponding to an equivalent fluid density of at least 55 pcf for the portion of the walls above groundwater and 120 pcf equivalent fluid density for the walls below groundwater level, which includes hydrostatic pressures. Placement and compaction of the wall backfill should be observed and tested by a representative of our office during construction.

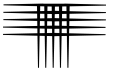
Potential design options for resisting the lateral loads include internal buttresses (full or partial height), external counterforts, T-shaped wall panels, tie-backs (helical or grouted anchors), internal bracing, and thickened walls. This list is not all inclusive and other alternatives are possible.

CONCRETE

Concrete in contact with soils can be subject to sulfate attack. We measured the water-soluble sulfate concentration in one sample from this site at less than 0.1 percent. Sulfate concentrations less than 0.1 percent indicate Class 0 exposure to sulfate attack for concrete in contact with the subsoils, according to ACI 201.2R-01 as published in the 2008 ACI Manual of Concrete Practice. For this level of sulfate concentration, the American Concrete Institute (ACI) indicates Type I cement can be used for concrete in contact with the subsoils. Superficial damage may occur to the exposed surfaces of highly permeable concrete, even though sulfate levels are relatively low. To control this risk and to resist freeze-thaw deterioration, the water-to-cementitious material ratio should not exceed 0.50 for concrete in contact with soils that are likely to stay moist due to surface drainage or high water tables. Concrete subjected to freeze-thaw cycles should be air entrained.

SURFACE DRAINAGE

Performance of the lift station foundation system at this site will be influenced, to a large degree, by the moisture conditions existing within the near-surface soils. Overall surface drainage patterns should be planned to provide for the rapid removal of storm runoff. Water should not be allowed to pond adjacent



to the structure. We recommend the following precautions be observed during construction and maintained at all times after the facility is completed.

1. Excessive wetting or drying of the open foundation excavation should be avoided.
2. Foundation wall backfill should be graded to provide for the rapid removal of runoff. We recommend a slope equivalent to at least 6 inches in the first 10 feet.
3. Roof downspouts from the above-grade, dry well equipment building should discharge well away from the structure. Downspout extensions and/or splash blocks should be provided to help reduce infiltration into the backfill adjacent to the structure.

CONSTRUCTION OBSERVATIONS

We recommend that CTL|Thompson, Inc. provide observation and testing services during construction to allow us the opportunity to verify whether soil conditions are consistent with those found during this investigation. If others perform these observations, they must accept responsibility to judge whether the recommendations in this report remain appropriate.

GEOTECHNICAL RISK

The concept of risk is an important aspect with any geotechnical evaluation primarily because the methods used to develop geotechnical recommendations do not comprise an exact science. We never have complete knowledge of subsurface conditions. Our analysis must be tempered with engineering judgment and experience. Therefore, the recommendations presented in any geotechnical evaluation should not be considered risk-free. Our recommendations represent our judgment of those measures that are necessary to increase the chances that the structure will perform satisfactorily. It is critical that all recommendations in this report are followed during construction.



LIMITATIONS

Our borings were drilled at the requested locations to obtain a reasonably accurate indication of subsurface conditions. The borings are representative of conditions encountered at the exact boring location only. Variations in subsurface conditions not indicated by the borings are possible. We recommend a representative of our office observe the completed foundation excavation to verify subsurface conditions are as anticipated from our borings. Representatives of our firm should be present during construction to provide construction observation and materials testing services.

We believe this investigation was conducted with that level of skill and care normally used by geotechnical engineers practicing in this area at this time. No warranty, express or implied, is made.

If we can be of further service in discussing the contents of this report or in the analysis of the influence of subsurface conditions on design of the lift station from a geotechnical engineering point-of-view, please call.

CTL | THOMPSON, INC

Richard A. Phillips, P. E.
Senior Principal Engineer



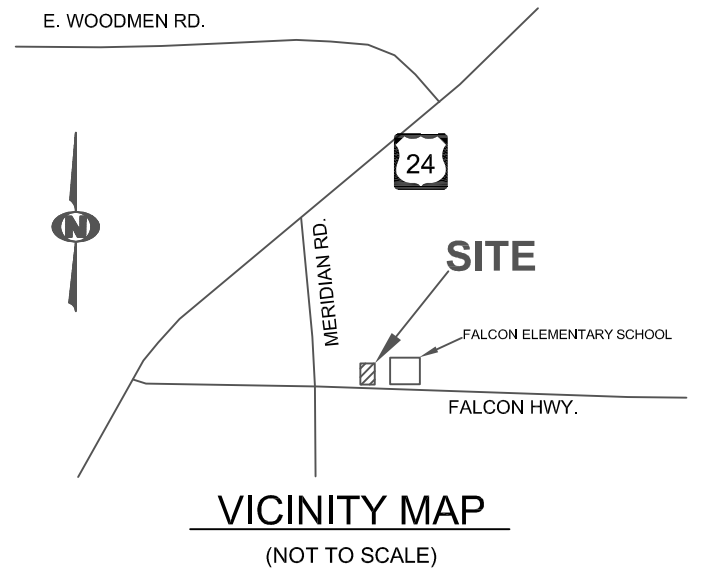
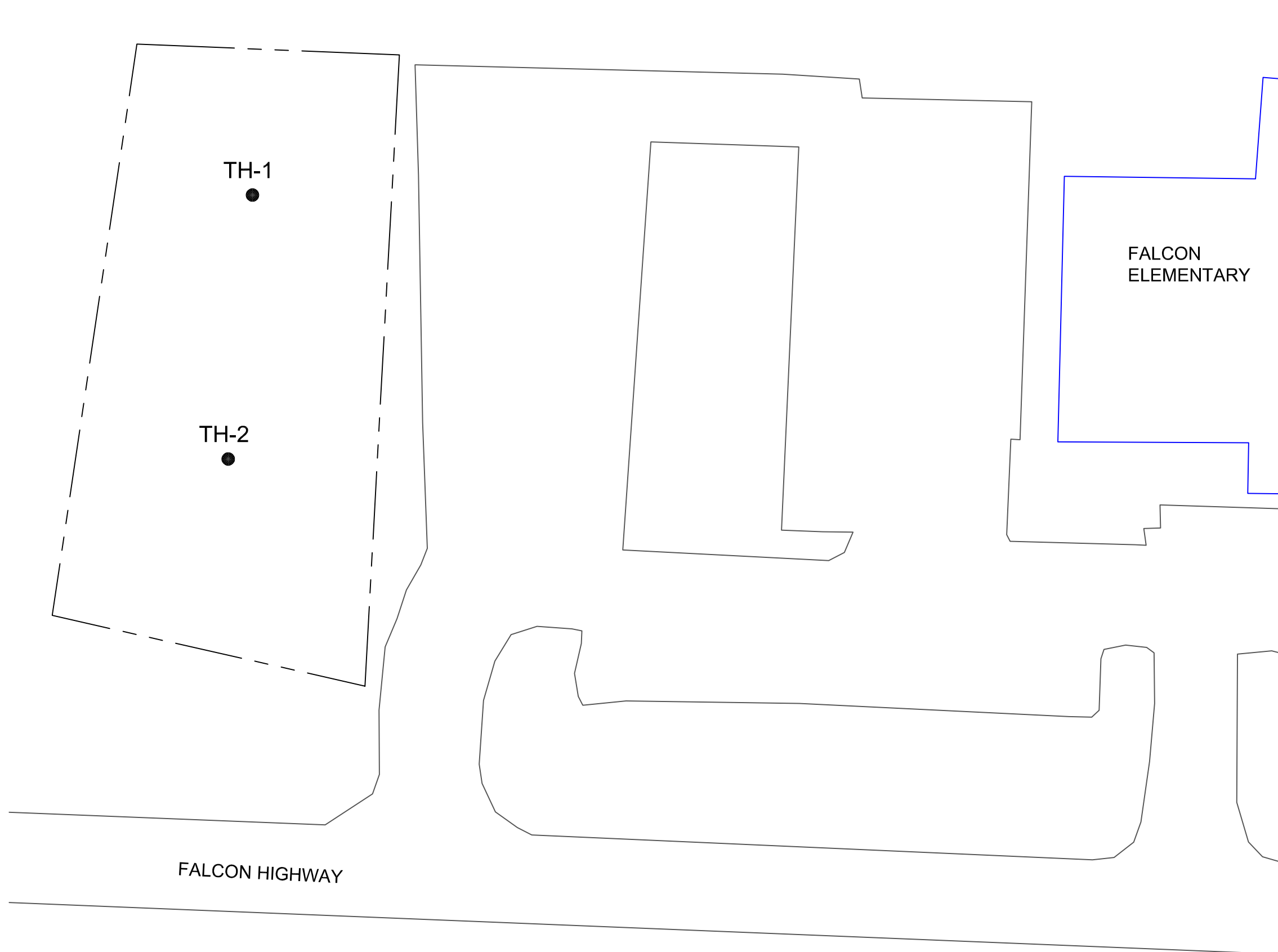
RAP:WCH:lc

(1 copy sent)

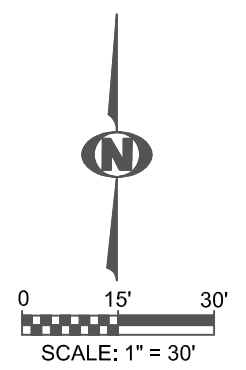
Via email: rmangino@jdshydro.com

Reviewed by:

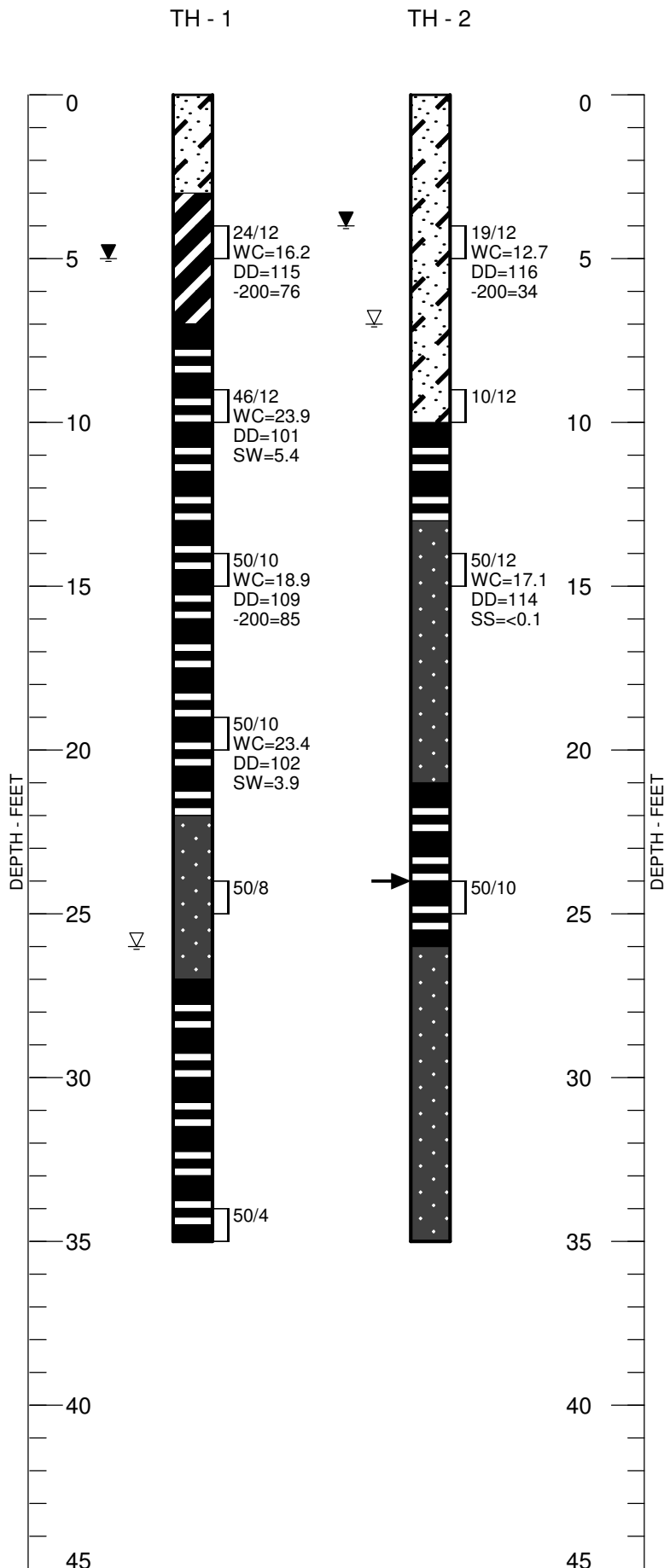
William C. Hoffmann, Jr., P. E.
Senior Principal Engineer



- LEGEND:
- TH-1 ● APPROXIMATE LOCATION OF EXPLORATORY BORING.
 - PROJECT BOUNDARY
 - LOCATION OF EXISTING BUILDING FOOTPRINT.



**Location of
Exploratory
Borings**



LEGEND:



SAND, CLAYEY TO VERY CLAYEY, MEDIUM DENSE, MOIST TO VERY MOIST, MEDIUM BROWN, MEDIUM GRAY. (SC)



SEVERELY WEATHERED CLAYSTONE, SANDY, MEDIUM HARD, MOIST, MEDIUM BROWN.



BEDROCK. CLAYSTONE, SANDY, MEDIUM HARD TO VERY HARD, MOIST, YELLOW BROWN, LIGHT TO DARK GRAY.



BEDROCK. SANDSTONE, CLAYEY TO VERY CLAYEY, MEDIUM HARD TO HARD, SLIGHTLY MOIST, LIGHT TO DARK GRAY.



DRIVE SAMPLE. THE SYMBOL 24/12 INDICATES 24 BLOWS OF A 140-POUND HAMMER FALLING 30 INCHES WERE REQUIRED TO DRIVE A 2.5-INCH O.D. SAMPLER 12 INCHES.



GROUNDWATER LEVEL MEASURED AT TIME OF DRILLING.



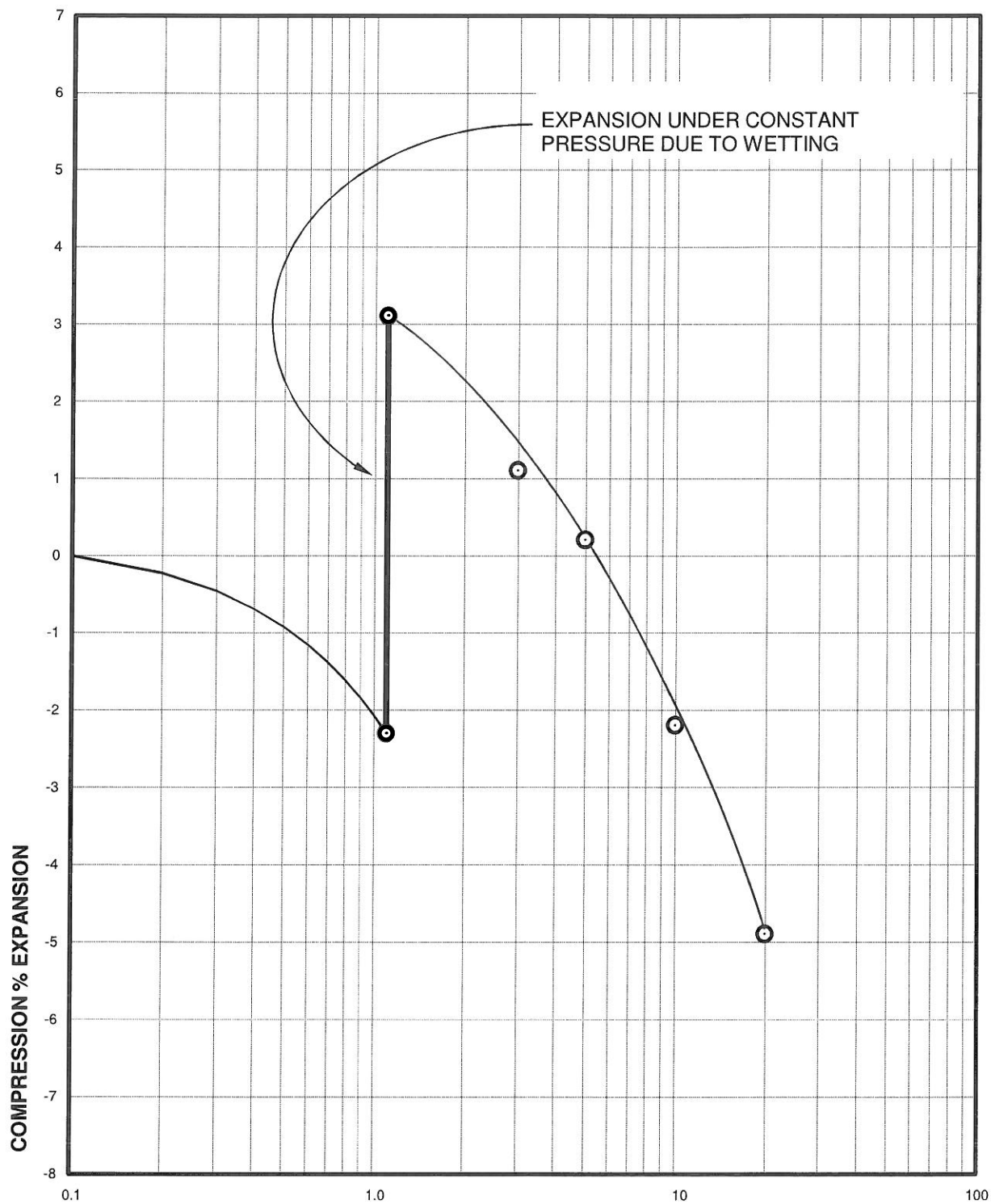
GROUNDWATER LEVEL MEASURED ONE DAY AFTER DRILLING.



INDICATES DEPTH WHERE THE TEST HOLE CAVED DURING DRILLING.

NOTES:

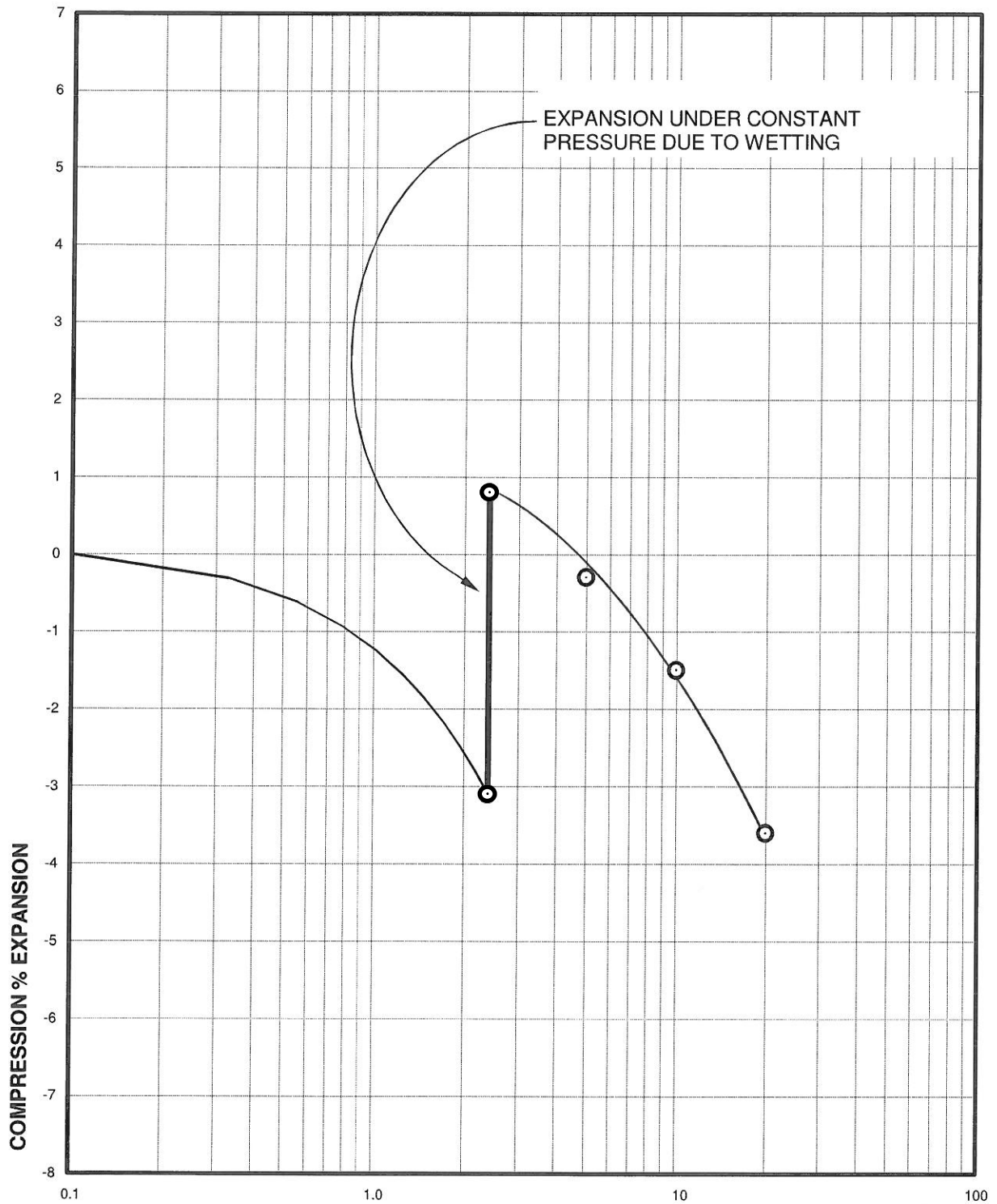
1. THE BORINGS WERE DRILLED SEPTEMBER 3, 2015 USING A 4-INCH DIAMETER, CONTINUOUS-FLIGHT AUGER AND A CME-45, TRUCK-MOUNTED DRILL RIG.
2. THESE LOGS ARE SUBJECT TO THE EXPLANATIONS, LIMITATIONS, AND CONCLUSIONS AS CONTAINED IN THIS REPORT.
3. WC - INDICATES MOISTURE CONTENT. (%)
DD - INDICATES DRY DENSITY. (PCF)
SW - INDICATES SWELL WHEN WETTED UNDER ESTIMATED OVERBURDEN PRESSURE. (%)
-200 - INDICATES PASSING NO. 200 SIEVE. (%)
SS - INDICATES WATER-SOLUBLE SULFATE CONTENT. (%)



APPLIED PRESSURE - KSF
Sample of CLAYSTONE, SANDY
From TH-1 AT 9 FEET

DRY UNIT WEIGHT= 101 PCF
MOISTURE CONTENT= 23.9 %

Swell Consolidation Test Results



APPLIED PRESSURE - KSF
 Sample of CLAYSTONE, SANDY
 From TH-1 AT 19 FEET

DRY UNIT WEIGHT= 102 PCF
 MOISTURE CONTENT= 23.4 %

Swell Consolidation Test Results

[illegible]

SUMMARY OF LABORATORY TESTING

[illegible]

* SWELL MEASURED UNDER ESTIMATED IN-SITU OVERBURDEN PRESSURE.
NEGATIVE VALUE INDICATES COMPRESSION.

APPENDIX C

2015 Financial Assurance Estimate Form (with pre-plat construction)

8/6/2015

Project Information	
WHMD Lift Station #1 Replaement	11/19/2018
Project Name	Date

Section 1 - Grading and Erosion Control BMPs	Quantity	Units		Price		% Complete	Remaining
Earthwork*	2,218.00	CY	@	\$ 5	=	\$ 11,090.00	\$ 11,090.00 *
Permanent Seeding* (inc. noxious weed mgmnt.)	0.21	AC	@	\$ 582	=	\$ 122.22	\$ 122.22 *
Mulching*	0.21	AC	@	\$ 507	=	\$ 106.47	\$ 106.47 *
Permanent Erosion Control Blanket*		SY	@	\$ 6	=	\$	\$ - *
Temporary Erosion Control Blanket		SY	@	\$ 3	=	\$	\$ -
Vehicle Tracking Control	1.00	EA	@	\$ 1,625	=	\$ 1,625.00	\$ 1,625.00
Safety Fence		LF	@	\$ 3	=	\$	\$ -
Silt Fence	865.00	LF	@	\$ 4	=	\$ 3,460.00	\$ 3,460.00
Temporary Seeding		AC	@	\$ 485	=	\$	\$ -
Temporary Mulch		AC	@	\$ 507	=	\$	\$ -
Erosion Bales		EA	@	\$ 21	=	\$	\$ -
Erosion Logs		LF	@	\$ 6	=	\$	\$ -
Rock Ditch Checks		EA	@	\$	=	\$	\$ -
Inlet Protection		EA	@	\$ 153	=	\$	\$ -
Sediment Basin		EA	@	\$ 1,625	=	\$	\$ -
Concrete Washout Basin	1.00	EA	@	\$ 776	=	\$ 776.00	\$ 776.00
			@	\$	=	\$	\$ -
* Subject to defect warranty financial assurance. DO NOT ENTER MORE THAN 80% COMPLETE. A minimum of 20% to be retained up to preliminary acceptance process.							
Section 1 Subtotal					=	\$ 17,179.69	\$ 17,179.69

Section 2 - Public Improvements**	Quantity	Units		Price		% Complete	Remaining
- Roadway Improvements							
Construction Traffic Control	1.00	LS	@	\$ 10,000	=	\$ 10,000.00	\$ 10,000.00 *
Aggregate Base Course	77.00	Tons	@	\$ 18	=	\$ 1,386.00	\$ 1,386.00 *
Asphalt Pavement		Tons	@	\$ 65	=	\$	\$ - *
Raised Median, Paved		SF	@	\$ 7	=	\$	\$ - *
Electrical Conduit, Size =		LF	@	\$ 14	=	\$	\$ - *
Traffic Signal, complete intersection		EA	@	\$ 250,000	=	\$	\$ - *
Regulatory Sign		EA	@	\$ 100	=	\$	\$ - *
Advisory Sign		EA	@	\$ 100	=	\$	\$ - *
Guide/Street Name Sign		EA	@	\$	=	\$	\$ - *
Epoxy Pavement Marking		SF	@	\$ 12	=	\$	\$ - *
Thermoplastic Pavement Marking		SF	@	\$ 22	=	\$	\$ - *
Barricade - Type 3		EA	@	\$ 115	=	\$	\$ - *
Delineator (Type I)		EA	@	\$ 21	=	\$	\$ - *
Curb and Gutter, Type C (Ramp)		LF	@	\$ 21	=	\$	\$ - *
Curb and Gutter, Type A (6" Vertical)		LF	@	\$ 16	=	\$	\$ - *
Curb and Gutter, Type B (Median)		LF	@	\$ 13	=	\$	\$ - *
Pedestrian Ramp		SY	@	\$ 108	=	\$	\$ - *

Cross Pan		SY	@	\$	\$53	=	\$		\$	-	*
Curb Chase		EA	@	\$	\$1,300	=	\$		\$	-	*
Guardrail Type 3 (W-Beam)		LF	@	\$	\$18	=	\$		\$	-	*
Guardrail Type 7 (Concrete)		LF	@	\$	\$67	=	\$		\$	-	*
Guardrail End Anchorage		EA	@	\$	\$1,978	=	\$		\$	-	*
Guardrail Impact Attenuator		EA	@	\$	\$3,564	=	\$		\$	-	*
Sound Barrier Fence		LF	@	\$	\$100	=	\$		\$	-	*
- Storm Drain Improvements											
Concrete Box Culvert (M Standard), Size (W x H)		LF	@	\$		=	\$		\$	-	*
Reinforced Concrete Pipe (RCP) Size		LF	@	\$		=	\$		\$	-	*
18" Reinforced Concrete Pipe		LF	@	\$	\$69	=	\$		\$	-	*
24" Reinforced Concrete Pipe		LF	@	\$	\$84	=	\$		\$	-	*
30" Reinforced Concrete Pipe		LF	@	\$	\$94	=	\$		\$	-	*
36" Reinforced Concrete Pipe		LF	@	\$	\$124	=	\$		\$	-	*
42" Reinforced Concrete Pipe		LF	@	\$	\$134	=	\$		\$	-	*
48" Reinforced Concrete Pipe		LF	@	\$	\$178	=	\$		\$	-	*
54" Reinforced Concrete Pipe		LF	@	\$	\$182	=	\$		\$	-	*
60" Reinforced Concrete Pipe		LF	@	\$	\$216	=	\$		\$	-	*
66" Reinforced Concrete Pipe		LF	@	\$	\$263	=	\$		\$	-	*
72" Reinforced Concrete Pipe		LF	@	\$	\$283	=	\$		\$	-	*
Corrugated Steel Pipe (CSP) Size		LF	@	\$		=	\$		\$	-	*
18" Corrugated Steel Pipe		LF	@	\$	\$66	=	\$		\$	-	*
24" Corrugated Steel Pipe		LF	@	\$	\$96	=	\$		\$	-	*
30" Corrugated Steel Pipe		LF	@	\$	\$101	=	\$		\$	-	*
36" Corrugated Steel Pipe		LF	@	\$	\$136	=	\$		\$	-	*
42" Corrugated Steel Pipe		LF	@	\$	\$147	=	\$		\$	-	*
48" Corrugated Steel Pipe		LF	@	\$	\$169	=	\$		\$	-	*
54" Corrugated Steel Pipe		LF	@	\$	\$193	=	\$		\$	-	*
60" Corrugated Steel Pipe		LF	@	\$	\$227	=	\$		\$	-	*
66" Corrugated Steel Pipe		LF	@	\$	\$278	=	\$		\$	-	*
72" Corrugated Steel Pipe		LF	@	\$	\$330	=	\$		\$	-	*
78" Corrugated Steel Pipe		LF	@	\$	\$381	=	\$		\$	-	*
84" Corrugated Steel Pipe		LF	@	\$	\$432	=	\$		\$	-	*
Flared End Section (FES) RCP †		EA	@	\$		=	\$		\$	-	*
Flared End Section (FES) CSP †		EA	@	\$		=	\$		\$	-	*
End Treatment- Headwall		EA	@	\$		=	\$		\$	-	*
End Treatment- Wingwall		EA	@	\$		=	\$		\$	-	*
End Treatment - Cutoff Wall		EA	@	\$		=	\$		\$	-	*
Curb Inlet (Type R) L=5', Depth < 5 feet		EA	@	\$	\$3,791	=	\$		\$	-	*
Curb Inlet (Type R) L=5', 5'-10' Depth		EA	@	\$	\$5,044	=	\$		\$	-	*
Curb Inlet (Type R) L =5' , 10'-15' Depth		EA	@	\$	\$6,027	=	\$		\$	-	*
Curb Inlet (Type R) L =10', Depth < 5 feet		EA	@	\$	\$5,528	=	\$		\$	-	*
Curb Inlet (Type R) L =10' , 5'-10' Depth		EA	@	\$	\$6,694	=	\$		\$	-	*
Curb Inlet (Type R) L =10' , 10'-15' Depth		EA	@	\$	\$7,500	=	\$		\$	-	*
Curb Inlet (Type R) L =15' , Depth < 5 feet		EA	@	\$	\$7,923	=	\$		\$	-	*
Curb Inlet (Type R) L =15' , 5'-10' Depth		EA	@	\$	\$8,000	=	\$		\$	-	*
Curb Inlet (Type R) L =15' , 10'-15' Depth		EA	@	\$	\$8,800	=	\$		\$	-	*
Curb Inlet (Type R) L =20' , Depth < 5 feet		EA	@	\$	\$8,000	=	\$		\$	-	*
Curb Inlet (Type R) L =20' , 5'-10' Depth		EA	@	\$	\$8,830	=	\$		\$	-	*
Curb Inlet (Type R) L =____', ____' - ____' Depth		EA	@	\$		=	\$		\$	-	*
Curb Inlet (Type R) L =____', ____' - ____' Depth		EA	@	\$		=	\$		\$	-	*
Grated Inlet (Type C), < 5' deep		EA	@	\$	\$3,270	=	\$		\$	-	*
Grated Inlet (Type D), < 5' deep		EA	@	\$	\$3,908	=	\$		\$	-	*
Storm Sewer Manhole, Box Base, Depth < 15 feet		EA	@	\$	\$8,592	=	\$		\$	-	*
Storm Sewer Manhole, Slab Base, Depth < 15 feet		EA	@	\$	\$4,575	=	\$		\$	-	*
Geotextile (Erosion Control)		SY	@	\$	\$5	=	\$		\$	-	*
Rip Rap, d50 Size from 6" to 24"		CY	@	\$	\$98	=	\$		\$	-	*
Rip Rap, Grouted		CY	@	\$	\$215	=	\$		\$	-	*
Drainage Channel Construction, Size (W x H)		LF	@	\$		=	\$		\$	-	*

Channel Lining, Concrete		CY	@	\$	\$450	=	\$		\$	-	*
Channel Lining, Rip Rap		CY	@	\$	\$98	=	\$		\$	-	*
Channel Lining, Grass		AC	@	\$	\$1,287	=	\$		\$	-	*
Channel Lining, Other Stabilization		SY	@	\$	\$3	=	\$		\$	-	*
Detention Outlet Structure		EA	@	\$		=	\$		\$	-	*
Detention Emergency Spillway		EA	@	\$		=	\$		\$	-	*
Permanent Water Quality Facility (Describe)		EA	@	\$		=	\$		\$	-	*
* Subject to defect warranty financial assurance. DO NOT ENTER MORE THAN 80% COMPLETE. A minimum of 20% to be retained up to preliminary acceptance process. + For flared end sections, multiply pipe LF cost by 6											
						=	11,386.00	Covered by Letter of Responsibility		11,386.00	**
		Section 2 Subtotal					\$				

Section 3 - Common Development Improvements (Private or District)***	Quantity	Units		Price		% Complete	Remaining
- Roadway Improvements							
(Include any applicable items from above Public Improvements list, that are to be private and NOT maintained by El Paso County)			@	\$	=	\$	\$ -
			@	\$	=	\$	\$ -
			@	\$	=	\$	\$ -
Concrete Sidewalk		SY	@	\$ \$38	=	\$	\$ -
			@	\$	=	\$	\$ -
			@	\$	=	\$	\$ -
- Storm Drain Improvements							
(Include any applicable items from above Public Improvements list, that are to be private and NOT maintained by El Paso County)			@	\$	=	\$	\$ -
			@	\$	=	\$	\$ -
			@	\$	=	\$	\$ -
18" Corrugated Steel Pipe			@	\$ 66	=	\$	\$ -
			@	\$	=	\$	\$ -
			@	\$	=	\$	\$ -
- Water System Improvements							
Water Main Pipe (PVC), Size 8"		LF	@	\$ \$94	=	\$	\$ -
Water Main Pipe (Ductile Iron), Size 8"		LF	@	\$ \$137	=	\$	\$ -
Gate Valves, 8"		EA	@	\$ \$1,852	=	\$	\$ -
Fire Hydrant Assembly w/ all valves		EA	@	\$ \$6,430	=	\$	\$ -
Water Service Line Installation, including tap and valves		EA	@	\$ 1,253	=	\$	\$ -
Fire Cistern Installation, complete		EA	@	\$	=	\$	\$ -
- Sanitary Sewer Improvements							
Sewer Main Pipe (PVC), Size 8"		LF	@	\$ \$94	=	\$	\$ -
Sanitary Sewer Manhole, Depth < 15 feet		EA	@	\$ \$4,575	=	\$	\$ -
Sanitary Service Line Installation, complete		EA	@	\$ 1,516	=	\$	\$ -
Sanitary Sewer Lift Station, complete		EA	@	\$	=	\$	\$ -
- Landscaping (If Applicable)							
(List landscaping line items and cost - usually only in case of subdivision specific condition of approval, or PUD)		EA	@	\$	=	\$	\$ -
		EA	@	\$	=	\$	
		EA	@	\$	=	\$	\$ -
		EA	@	\$	=	\$	\$ -
		EA	@	\$	=	\$	\$ -
***items in this section are not subject to defect warranty financial assurance							
				Section 3 Subtotal	=	\$	

Financial Assurance Totals

As-built drawings - (FILL IN IF THERE ARE ANY PUBLICLY-MAINTAINED IMPROVEMENTS)

\$

(Inc. survey to verify detention pond volumes.)

Total Construction Financial Assurance **\$28,565.69**

(Sum of all section subtotals)

Total Remaining Construction Financial Assurance **28,565.69**

(Sum of all section totals less credit for items complete)

Total Defect Warranty Financial Assurance **\$4,540.94**

(20% of all items identified as public improvements(*). To be collateralized at time of preliminary acceptance)

Per Direction by EPC as part of this project: Total Financial Assurance Less ROW Improvements (Section 2) **17,179.69****Approvals**

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

Ryan M. Mangino, PE

11/19/2018

Engineer

Date



Approved by Owner / Applicant

Date

11/19/18

Approved by El Paso County Engineer / ECM Administrator

Date

APPENDIX D

J:\JDS-Hydro\Project Files\112 Woodmen Hills\112.96 Lift Station - 1 Replacement\Drawings\11296_1_GEC.dwg 2018/12/03 11:21 AM By: RMM

EROSION CONTROL NOTES:

1. CONSTRUCTION MAY NOT COMMENCE UNTIL A CONSTRUCTION PERMIT IS OBTAINED FROM THE PLANNING & COMMUNITY DEVELOPMENT DEPARTMENT AND A PRE-CONSTRUCTION CONFERENCE IS HELD WITH PCD INSPECTIONS.
2. STORMWATER DISCHARGES FROM CONSTRUCTION SITES SHALL NOT CAUSE OR THREATEN TO CAUSE POLLUTION, CONTAMINATION, OR DEGRADATION OF STATE WATERS. ALL WORK AND EARTH DISTURBANCE SHALL BE DONE IN A MANNER THAT MINIMIZES POLLUTION OF ANY ON-SITE OR OFF SITE WATERS, INCLUDING WETLANDS.
3. NOTWITHSTANDING ANYTHING DEPICTED IN THESE PLANS IN WORDS OR GRAPHIC REPRESENTATION, ALL DESIGN AND CONSTRUCTION RELATED TO ROADS, STORM DRAINAGE AND EROSION CONTROL SHALL CONFORM TO THE STANDARDS AND REQUIREMENTS OF THE MOST RECENT VERSION OF THE RELEVANT ADOPTED EL PASO COUNTY STANDARDS, INCLUDING THE LAND DEVELOPMENT CODE, THE ENGINEERING CRITERIA MANUAL, THE DRAINAGE CRITERIA MANUAL, AND THE DRAINAGE CRITERIA MANUAL VOLUME 2. ANY DEVIATIONS TO REGULATIONS AND STANDARDS MUST BE REQUESTED, AND APPROVED, IN WRITING.
4. A SEPARATE STORMWATER MANAGEMENT PLAN (SWMP) FOR THIS PROJECT SHALL BE COMPLETED AND AN EROSION AND STORMWATER QUALITY CONTROL PERMIT (ESQCP) ISSUED PRIOR TO COMMENCING CONSTRUCTION. DURING CONSTRUCTION THE SWMP IS THE RESPONSIBILITY OF THE DESIGNATED STORMWATER MANAGER, SHALL BE LOCATED ON SITE AT ALL TIMES AND SHALL BE KEPT UP TO DATE WITH WORK PROGRESS AND CHANGES IN THE FIELD.
5. ONCE THE ESQCP HAS BEEN ISSUED, THE CONTRACTOR MAY INSTALL THE INITIAL STAGE EROSION AND SEDIMENT CONTROL BMPS AS INDICATED ON THE GEC. A PRECONSTRUCTION MEETING BETWEEN THE CONTRACTOR, ENGINEER, AND EL PASO COUNTY WILL BE HELD PRIOR TO ANY CONSTRUCTION. IT IS THE RESPONSIBILITY OF THE APPLICANT TO COORDINATE THE MEETING TIME AND PLACE WITH COUNTY PCD INSPECTIONS STAFF.
6. SOIL EROSION CONTROL MEASURES FOR ALL SLOPES, CHANNELS, DITCHES, OR ANY DISTURBED LAND AREA SHALL BE COMPLETED WITHIN 21 CALENDAR DAYS AFTER FINAL GRADING, OR FINAL EARTH DISTURBANCE, HAS BEEN COMPLETED. DISTURBED AREAS AND STOCKPILES WHICH ARE NOT AT FINAL GRADE BUT WILL REMAIN DORMANT FOR LONGER THAN 30 DAYS SHALL ALSO BE MULCHED WITHIN 21 DAYS AFTER INTERIM GRADING. AN AREA THAT IS GOING TO REMAIN IN AN INTERIM STATE FOR MORE THAN 60 DAYS SHALL ALSO BE SEEDED. ALL TEMPORARY SOIL EROSION CONTROL MEASURES AND BMPS SHALL BE MAINTAINED UNTIL PERMANENT SOIL EROSION CONTROL MEASURES ARE IMPLEMENTED AND ESTABLISHED.
7. TEMPORARY SOIL EROSION CONTROL FACILITIES SHALL BE REMOVED AND EARTH DISTURBANCE AREAS GRADED AND STABILIZED WITH PERMANENT SOIL EROSION CONTROL MEASURES PURSUANT TO STANDARDS AND SPECIFICATION PRESCRIBED IN THE DCM VOLUME II AND THE ENGINEERING CRITERIA MANUAL (ECM) APPENDIX I.
8. ALL PERSONS ENGAGED IN EARTH DISTURBANCE SHALL IMPLEMENT AND MAINTAIN ACCEPTABLE SOIL EROSION AND SEDIMENT CONTROL MEASURES INCLUDING BMPS IN CONFORMANCE WITH THE EROSION CONTROL TECHNICAL STANDARDS OF THE DRAINAGE CRITERIA MANUAL (DCM) VOLUME II AND IN ACCORDANCE WITH THE STORMWATER MANAGEMENT PLAN (SWMP).
9. ALL TEMPORARY EROSION CONTROL FACILITIES INCLUDING BMPS AND ALL PERMANENT FACILITIES INTENDED TO CONTROL EROSION OF ANY EARTH DISTURBANCE OPERATIONS, SHALL BE INSTALLED AS DEFINED IN THE APPROVED PLANS, THESWMP AND THE DCM VOLUME II AND MAINTAINED THROUGHOUT THE DURATION OF THE EARTH DISTURBANCE OPERATION.
10. ANY EARTH DISTURBANCE SHALL BE CONDUCTED IN SUCH A MANNER SO AS TO EFFECTIVELY REDUCE ACCELERATED SOIL EROSION AND RESULTING SEDIMENTATION. ALL DISTURBANCES SHALL BE DESIGNED, CONSTRUCTED, AND COMPLETED SO THAT THE EXPOSED AREA OF ANY DISTURBED LAND SHALL BE LIMITED TO THE SHORTEST PRACTICAL PERIOD OF TIME.
11. ANY TEMPORARY OR PERMANENT FACILITY DESIGNED AND CONSTRUCTED FOR THE CONVEYANCE OF STORMWATER AROUND, THROUGH, OR FROM THE EARTH DISTURBANCE AREA SHALL BE DESIGNED TO LIMIT THE DISCHARGE TO A NON-EROSIVE VELOCITY.
12. CONCRETE WASH WATER SHALL BE CONTAINED AND DISPOSED OF IN ACCORDANCE WITH THE SWMP. NO WASH WATER SHALL BE DISCHARGED TO OR ALLOWED TO RUNOFF TO STATE WATERS, INCLUDING ANY SURFACE OR SUBSURFACE STORM DRAINAGE SYSTEM OR FACILITIES.
13. EROSION CONTROL BLANKETING IS TO BE USED ON SLOPES STEEPER THAN 3:1.
14. BUILDING, CONSTRUCTION, EXCAVATION, OR OTHER WASTE MATERIALS SHALL NOT BE TEMPORARILY PLACED OR STORED IN THE STREET, ALLEY, OR OTHER PUBLIC WAY, UNLESS IN ACCORDANCE WITH AN APPROVED TRAFFIC CONTROL PLAN. BMP'S MAY BE REQUIRED BY EL PASO COUNTY ENGINEERING IF DEEMED NECESSARY, BASED ON SPECIFIC CONDITIONS AND CIRCUMSTANCES.
15. VEHICLE TRACKING OF SOILS AND CONSTRUCTION DEBRIS OFF-SITE SHALL BE MINIMIZED. MATERIALS TRACKED OFFSITE SHALL BE CLEANED UP AND PROPERLY DISPOSED OF IMMEDIATELY.
16. CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL WASTES FROM THE CONSTRUCTION SITE FOR DISPOSAL IN ACCORDANCE WITH LOCAL AND STATE REGULATORY REQUIREMENTS. NO CONSTRUCTION DEBRIS, TREE SLASH, BUILDING MATERIAL WASTES OR UNUSED BUILDING MATERIALS SHALL BE BURIED, DUMPED, OR DISCHARGED AT THE SITE.
17. THE OWNER, SITE DEVELOPER, CONTRACTOR, AND/OR THEIR AUTHORIZED AGENTS SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL CONSTRUCTION DEBRIS, DIRT, TRASH, ROCK, SEDIMENT, AND SAND THAT MAY ACCUMULATE IN THE STORM SEWER OR OTHER DRAINAGE CONVEYANCE SYSTEM AND STORMWATER APPURTENANCES AS A RESULT OF SITE DEVELOPMENT.
18. THE QUANTITY OF MATERIALS STORED ON THE PROJECT SITE SHALL BE LIMITED, AS MUCH AS PRACTICAL, TO THAT QUANTITY REQUIRED TO PERFORM THE WORK IN AN ORDERLY SEQUENCE. ALL MATERIALS STORED ON-SITE SHALL BE STORED IN A NEAT, ORDERLY MANNER, IN THEIR ORIGINAL CONTAINERS, WITH ORIGINAL MANUFACTURER'S LABELS.
19. NO CHEMICALS ARE TO BE USED BY THE CONTRACTOR, WHICH HAVE THE POTENTIAL TO BE RELEASED IN STORMWATER UNLESS PERMISSION FOR THE USE OF A SPECIFIC CHEMICAL IS GRANTED IN WRITING BY THE ECM ADMINISTRATOR. IN GRANTING THE USE OF SUCH CHEMICALS, SPECIAL CONDITIONS AND MONITORING MAY BE REQUIRED.
20. BULK STORAGE STRUCTURES FOR PETROLEUM PRODUCTS AND OTHER CHEMICALS SHALL HAVE ADEQUATE PROTECTION SO AS TO CONTAIN ALL SPILLS AND PREVENT ANY SPILLED MATERIAL FROM ENTERING STATE WATERS, INCLUDING ANY SURFACE OR SUBSURFACE STORM DRAINAGE SYSTEM OR FACILITIES.
21. NO PERSON SHALL CAUSE THE IMPEDIMENT OF STORMWATER FLOW IN THE FLOW LINE OF THE CURB AND GUTTER OR IN THE DITCHLINE.
22. INDIVIDUALS SHALL COMPLY WITH THE "COLORADO WATER QUALITY CONTROL ACT" (TITLE 25, ARTICLE 8, CRS), AND THE "CLEAN WATER ACT" (33 USC 1344), IN ADDITION TO THE REQUIREMENTS INCLUDED IN THE DCM VOLUME II AND THE ECM APPENDIX I. ALL APPROPRIATE PERMITS MUST BE OBTAINED BY THE CONTRACTOR PRIOR TO CONSTRUCTION (NPDES, FLOODPLAIN, 404, FUGITIVE DUST, ETC.). IN THE EVENT OF CONFLICTS BETWEEN THESE REQUIREMENTS AND LAWS, RULES, OR REGULATIONS OF OTHER FEDERAL, STATE, OR COUNTY AGENCIES, THE MORE RESTRICTIVE LAWS, RULES, OR REGULATIONS SHALL APPLY.
23. ALL CONSTRUCTION TRAFFIC MUST ENTER/EXIT THE SITE AT APPROVED CONSTRUCTION ACCESS POINTS.
24. PRIOR TO ACTUAL CONSTRUCTION THE PERMITEE SHALL VERIFY THE LOCATION OF EXISTING UTILITIES.
25. A WATER SOURCE SHALL BE AVAILABLE ON SITE DURING EARTHWORK OPERATIONS AND UTILIZED AS REQUIRED TO MINIMIZE DUST FROM EARTHWORK EQUIPMENT AND WIND.
26. THE SOILS REPORT FOR THIS SITE HAS BEEN PREPARED BY CTL-THOMPSON, INC. DATED SEPTEMBER 29, 2015, AND SHALL BE CONSIDERED A PART OF THESE PLANS.

27. AT LEAST TEN DAYS PRIOR TO THE ANTICIPATED START OF CONSTRUCTION, FOR PROJECTS THAT WILL DISTURB 1 ACRE OR MORE, THE OWNER OR OPERATOR OF CONSTRUCTION ACTIVITY SHALL SUBMIT A PERMIT APPLICATION FOR STORMWATER DISCHARGE TO THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT, WATER QUALITY DIVISION. THE APPLICATION CONTAINS CERTIFICATION OF COMPLETION OF A STORMWATER MANAGEMENT PLAN (SWMP), OF WHICH THIS GRADING AND EROSION CONTROL PLAN MAY BE A PART. FOR INFORMATION OR APPLICATION MATERIALS CONTACT:

COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT
WATER QUALITY CONTROL DIVISION
WQCD – PERMITS
4300 CHERRY CREEK DRIVE SOUTH
DENVER, CO 80246-1530
ATTN: PERMITS UNIT
28. ALL AREAS NOTED TO BE RESEEDED SHALL BE SEEDED WITH A NATIVE AND INTRODUCED GRASS MIXTURE. THE SEED WILL BE APPLIED USING MECHANICAL TYPE DRILLS AT 0.25"—0.5" INTO TOPSOIL. AREA NOT ACCESSIBLE TO A DRILL SEEDER AND SLOPES STEEPER THAN 2:1 SHALL BE HAND BROADCAST AT DOUBLE THE ABOVE SEED RATE AND RAKED AT 1/4 TO 1/2 INTO THE TOPSOIL. ALL SEEDED AREAS WILL BE MULCHED: 1-1/2 TONS CERTIFIED WEED FREE NATIVE HAY PER ACRE MECHANICALLY CRIMPED IN TOPSOIL IN COMBINATION WITH AN ORGANIC MULCH TACKIFIER. MAINTENANCE OF ANY SWALES WILL INCLUDE EROSION CONTROL AND PREVENTION, DEBRIS REMOVAL AND OCCASIONAL MOWING. CARE SHALL BE USED DURING THE REMOVAL OF SEDIMENT FROM ANY DRAINAGE WAYS. ANY SEEDING OR EROSION CONTROL MEASURE THAT IS DISTURBED DURING MAINTENANCE SHALL BE IMMEDIATELY REPAIRED. EXISTING VEGETATIVE COVER WHERE DISTURBANCE IS TO TAKE PLACE IS ROUGHLY 50%. THE SEED MIX SHALL BE MADE UP OF THE FOLLOWING AS PER THE EL PASO COUNTY CONSERVATION DISTRICT (RECOMMENDATION OBTAINED APRIL 2015):

TIMING, CONSTRUCTION STAGING AND SEQUENCING:

EXPECTED START DATE: MARCH 2019
INSTALL TEMPORARY EROSION CONTROL – 2 DAYS
– PERIMETER SILT FENCING
– VEHICLE TRACKING CONTROL PAD

ROUGH GRADING – 2 DAYS
INSTALL FINAL SITE IMPROVEMENTS – 7 MONTHS
REMOVE TEMPORARY EROSION CONTROL – 5 DAYS

MINIMUM BEST MANAGEMENT PRACTICES ELEMENTS:

- STEP 1- EROSION AND SEDIMENT CONTROL
INSTALL SEDIMENT TRAPPING DEVICES (PERIMETER CONTROLS) PRIOR TO THE START OF CONSTRUCTION.
- STEP 2- SPILL PREVENTION AND RESPONSE
- STEP 3- MATERIAL MANAGEMENT
MATERIAL AND EQUIPMENT STORAGE AREAS SHALL BE SECURE AND CONTAINED TO PREVENT DISCHARGE OF ANY MATERIAL IN RUNOFF. WASTE SHALL BE CONTAINED AND DISPOSED OF PROPERLY. MAINTAIN BMP'S DURING BUILDING AND UTILITY CONSTRUCTION.
- STEP 4- INSPECTION AND MAINTENANCE
(SEE EROSION CONTROL NOTES)
- STEP 5- INSTALL FINAL STABILIZATION – BASE COURSE, LANDSCAPING, EROSION CONTROL BLANKETS, AND SEEDING.
- STEP 6- REMOVE TEMPORARY CONTROLS – SILT FENCING AFTER PERMANENT FEATURES ARE INSTALLED.

FINAL STABILIZATION AND LONG-TERM STORMWATER MANAGEMENT:

FINAL STABILIZATION MEASURES INCLUDE BASE COURSE, PARTIAL LANDSCAPE, AND REVEGETATION

EARTHWORK SUMMARY:


PROPOSED LIFT STATION SITE:
CUT – 1,109 CY (INCLUDES EM TANK, GRAVEL FOR TANK, BASE COURSE, & MANHOLES STRUCTURAL EXCAVATION)
FILL – 964 (*1.15) = 1,109 CY
NET – 0 CY CUT/FILL

DISTURBED AREA – 0.96 AC

EROSION CONTROL FACILITIES:

SILT FENCE (SF) – 865 LF
VEHICLE TRACKING PAD (VT) – 1

COMMON NAME (N=NATIVE, I=INTRODUCED)		SCIENTIFIC NAME	LBS PLS/ACRE
WHEATGRASS, SIBERIAN	I	AGROPYRON FRAGILE	2.04
WHEATGRASS, SLENDER	N	ELYMUS TRACHYCAULUS	10.90
WHEATGRASS, INTERMEDIATE	I	THINOPYRUM INTERMEDIUM	3.00
WILDRYE, RUSSIAN	I	PSATHYROSTACHYS JUNCEA	2.04
WHEATGRASS, WESTERN	N	PASCOPYRUM SMITHII	3.20
CLOVER, RED	I	TRIFOLIUM PRATENSE	0.40
FLAX, BLUE-APPAR	I	LINUM PERENNE	0.41
SULPHUR-FLOWER BUCKWHEAT	N	ERIOGONUM UMBELLATUM	0.55
TOTAL/POUNDS/ACRE			22.54



CONSULTANTS, INC.
545 EAST PIKES PEAK AVENUE, SUITE 300
COLORADO SPRINGS, COLORADO 80903
(719) 227-0072

DISCLAIMER: THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS. ANY ERRORS OR OMISSIONS SHALL BE REPORTED TO JDS-HYDRO CONSULTANTS, INC. JDS-HYDRO ASSUMES NO LIABILITY FOR UNAUTHORIZED CHANGES AND/OR REVISIONS MADE TO PLANS.

WOODMEN HILLS METROPOLITAN DISTRICT

LIFT STATION #1 REPLACEMENT

GRADING & EROSION CONTROL NOTES

REVISIONS					
NO.	DESCRIPTION	BY	APP.	DATE	
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7					

100% DESIGN DRAWINGS



Project No.:	112.96
Date:	11/19/18
Design:	RMM
Drawn:	RMM
Check:	DES

ENGINEER'S STATEMENT:


THIS GRADING AND EROSION CONTROL PLAN WAS PREPARED UNDER MY DIRECTION AND SUPERVISION AND IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. SAID PLAN HAS BEEN PREPARED ACCORDING TO THE CRITERIA ESTABLISHED BY THE COUNTY FOR GRADING AND EROSION CONTROL PLANS. I ACCEPT RESPONSIBILITY FOR ANY LIABILITY CAUSED BY ANY NEGLIGENT ACTS, ERRORS OR OMISSIONS ON MY PART IN PREPARING THIS PLAN.


RYAN M. MANGINO, P.E. #43304

11/15/18
DATE

OWNER'S STATEMENT:

THE OWNER WILL COMPLY WITH THE REQUIREMENTS OF THE GRADING & EROSION CONTROL PLAN.


DATE 11/19/19

EL PASO COUNTY:

COUNTY PLAN REVIEW IS PROVIDED ONLY FOR GENERAL CONFORMANCE WITH COUNTY DESIGN CRITERIA. THE COUNTY IS NOT RESPONSIBLE FOR THE ACCURACY AND ADEQUACY OF THE DESIGN, DIMENSIONS, AND/ OR ELEVATIONS WHICH SHALL BE CONFIRMED AT THE JOB SITE. THE COUNTY THROUGH THE APPROVAL OF THIS DOCUMENT ASSUMES NO RESPONSIBILITY FOR COMPLETENESS AND/ OR ACCURACY OF THIS DOCUMENT.

FILED IN ACCORDANCE WITH THE REQUIREMENTS OF THE EL PASO COUNTY LAND DEVELOPMENT CODE, DRAINAGE CRITERIA, AND ENGINEERING CRITERIA MANUAL AS AMENDED.

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

JENNIFER IRVINE, P.E.
COUNTY ENGINEER

DATE

LEGEND

---	BOUNDARY / RIGHT-OF-WAY	---	GAS	---	EXISTING GAS LINE
- - -	EXISTING/PROPOSED EASEMENT	---	FOP	---	EXISTING FIBER OPTIC LINE
---	EXISTING WATER LINE	- - -	100-YR FLOODPLAIN (APPROX.)	---	PROPOSED PIPE
---	EXISTING RAW WATER LINE	---	EXISTING/PROPOSED VALVE	---	EXISTING/PROPOSED VALVE
---	EXISTING SANITARY SEWER LINE	---	SANITARY SEWER MANHOLE	---	SANITARY SEWER MANHOLE
---	EXISTING FENCE	---	STORM SEWER MANHOLE	---	STORM SEWER MANHOLE
---	EXISTING UNDERGROUND ELECTRIC	---	FIRE HYDRANT	---	FIRE HYDRANT
---	EXISTING OVERHEAD ELECTRIC	---		---	
---	EXISTING TELEPHONE LINE	---		---	

100-YR FLOODPLAIN

WATER LINE
EASEMENT

EXISTING PROPERTY
LINE (ELEMENTARY
SCHOOL TRACT)

5-INCH THICK BASE
COURSE W/ 1" PERMEABLE
PAVER & 3/8" GRAVEL
(3,322 SF)
(SEE DETAILS SHEET C19)

0' 25' 50'
11x17 SCALE: 1"=50'
24x36 SCALE: 1"=25'

LOT (EASEMENT) COVERAGE

AREA OF EASEMENT	14,365 S.F.
GROSS FLOOR AREA OF BUILDING	600 S.F.
% EASEMENT COVERAGE WITH BUILDING	4%
AREA OF DRIVEWAY & PARKING	3,322 S.F.
% EASEMENT COVERAGE WITH DRIVEWAY & PARKING	23%

NOTES:

- SLOPES ON THE SITE RANGE FROM 33:1 TO 4:1, INCLUDING EXISTING TOPOGRAPHY AND PROPOSED GRADING.
- THERE ARE NO SLOPES STEEPER THAN 3:1; THEREFORE, EROSION CONTROL BLANKETS ARE NOT REQUIRED.
- ACCESS POINTS AND SITE NOT ACCESSIBLE TO PUBLIC.
- THE PARTIES RESPONSIBLE FOR THIS PLAN HAVE FAMILIARIZED THEMSELVES WITH ALL CURRENT ACCESSIBILITY CRITERIA AND SPECIFICATIONS AND THE PROPOSED PLAN REFLECTS ALL SITE ELEMENTS REQUIRED BY THE APPLICABLE ADA DESIGN STANDARDS AND GUIDELINES AS PUBLISHED BY THE UNITED STATES DEPARTMENT OF JUSTICE. APPROVAL OF THIS PLAN BY EL PASO COUNTY DOES NOT ASSURE COMPLIANCE WITH THE ADA OR ANY REGULATIONS OR GUIDELINES ENACTED OR PROMULGATED UNDER OR WITH RESPECT TO SUCH LAWS.

PCD File No. PPR1841



VICINITY MAP
N.T.S.

FALCON HIGHWAY
FUTURE R.O.W.

100-YR FLOODPLAIN


FALCON HIGHWAY
EXISTING R.O.W.

PROPOSED SILT FENCE
PROPOSED VEHICLE TRACKING PAD

NOTES:
1. SEED AND MULCH ALL DISTURBED AREAS.

WOODMEN HILLS METROPOLITAN DISTRICT

LIFT STATION #1 REPLACEMENT
GRADING & EROSION CONTROL PLAN

 JDS-HYDRO CONSULTANTS, INC.
545 EAST PIKES PEAK AVENUE, SUITE 300
COLORADO SPRINGS, COLORADO 80903
(719) 227-0072

DISCLAIMER: THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ANY ERRORS OR OMISSIONS SHALL BE REPORTED TO JDS-HYDRO CONSULTANTS, INC. JDS-HYDRO, A S.U.M.E. F.O. LIABILITY FOR UNAUTHORIZED CHANGES AND/OR REVISIONS MADE TO PLANS.

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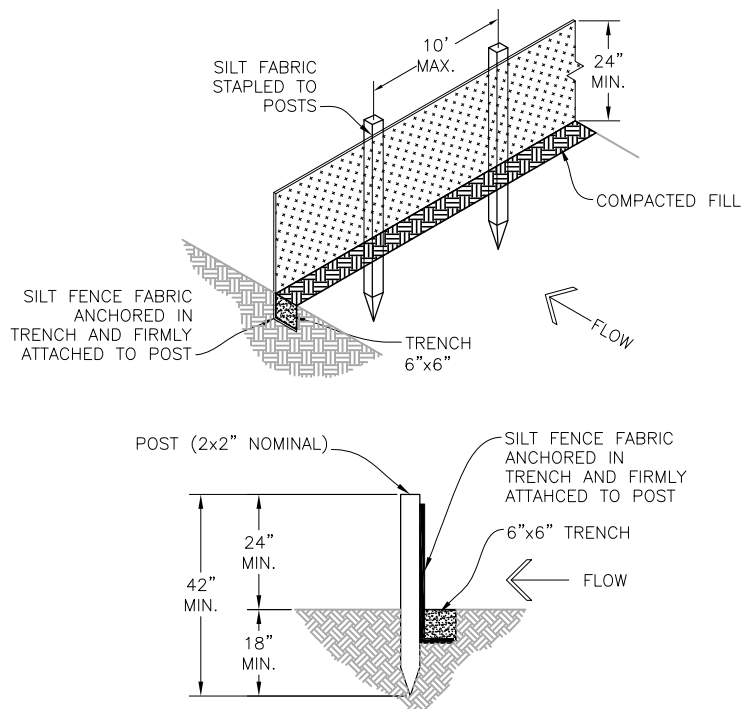


Project No.: 112.96
Date: 11/19/18
Design: RMM
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SHEET 14 OF 19

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SILT FENCE DETAIL
N.T.S.

INSTALLATION REQUIREMENTS:

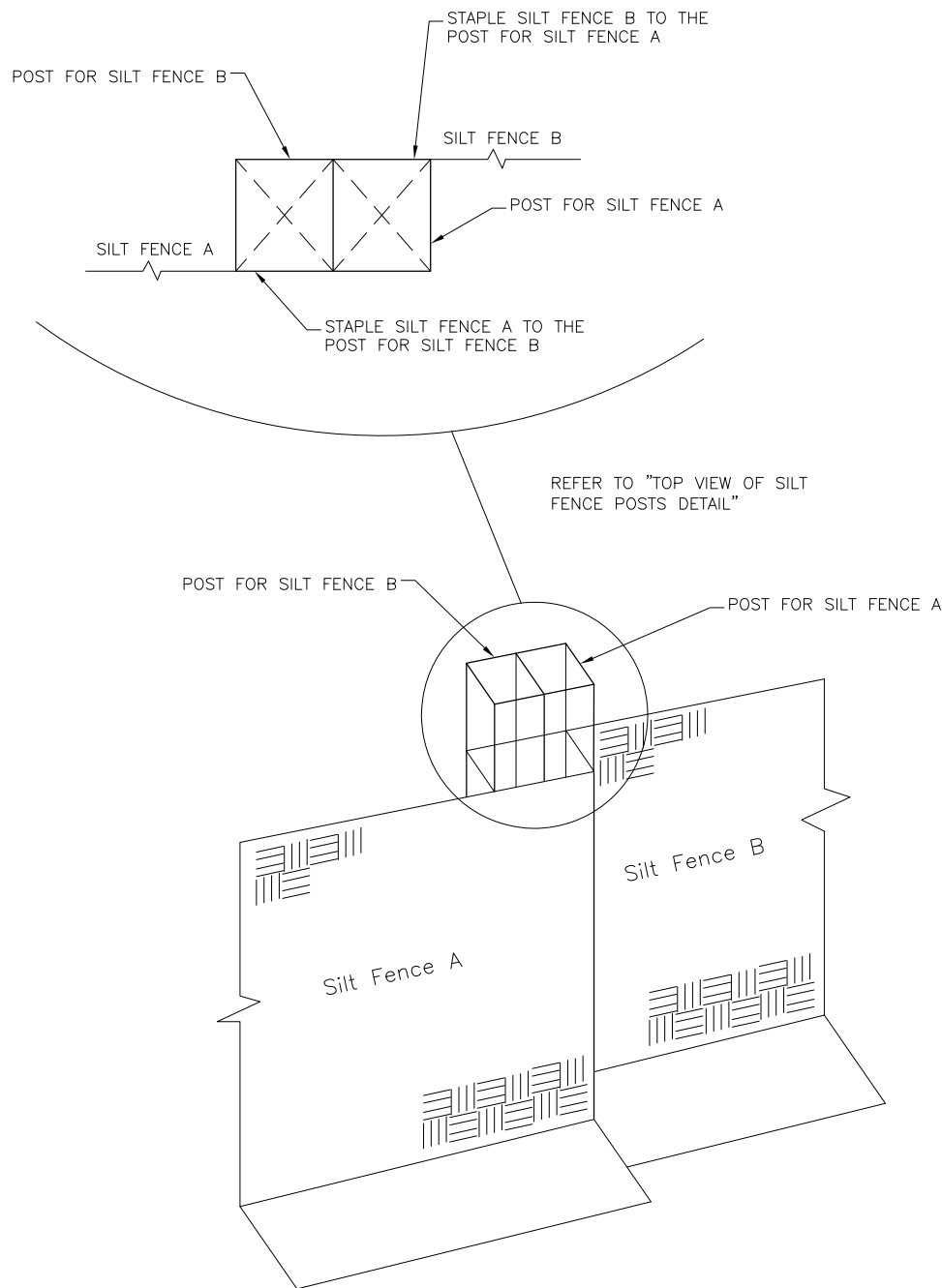
1. SILT FENCES SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.
2. WHEN JOINTS ARE NECESSARY, SILT FENCE GEOTEXTILE SHALL BE SPICED TOGETHER ONLY AT SUPPORT POST AND SECURELY SEALED.
3. METAL POSTS SHALL BE "STUDDED TEE" OR "U" TYPE WITH MINIMUM WEIGHT OF 1.33 POUNDS PER LINEAR FOOT. WOOD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

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

MAINTENANCE REQUIREMENTS:

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

TOP VIEW OF SILT FENCE POSTS DETAIL



PCD File No. PPR1841

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545 EAST PIKES PEAK AVENUE, SUITE 300
COLORADO SPRINGS, COLORADO 80903
(719) 227-0072

WOODMEN HILLS METROPOLITAN DISTRICT
LIFT STATION #1 REPLACEMENT
GRADING & EROSION CONTROL DETAILS 1

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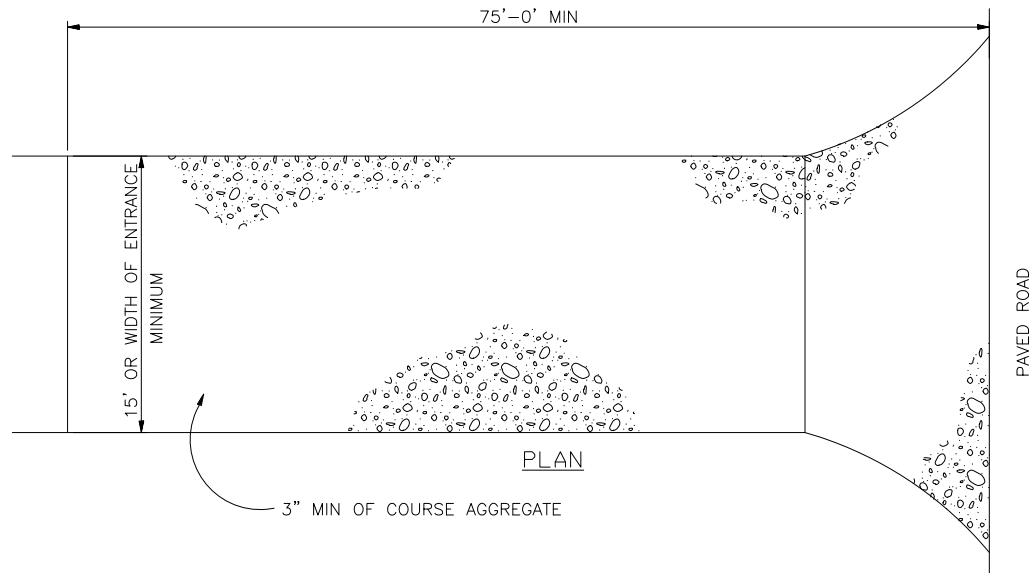
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SHEET 15 OF 19

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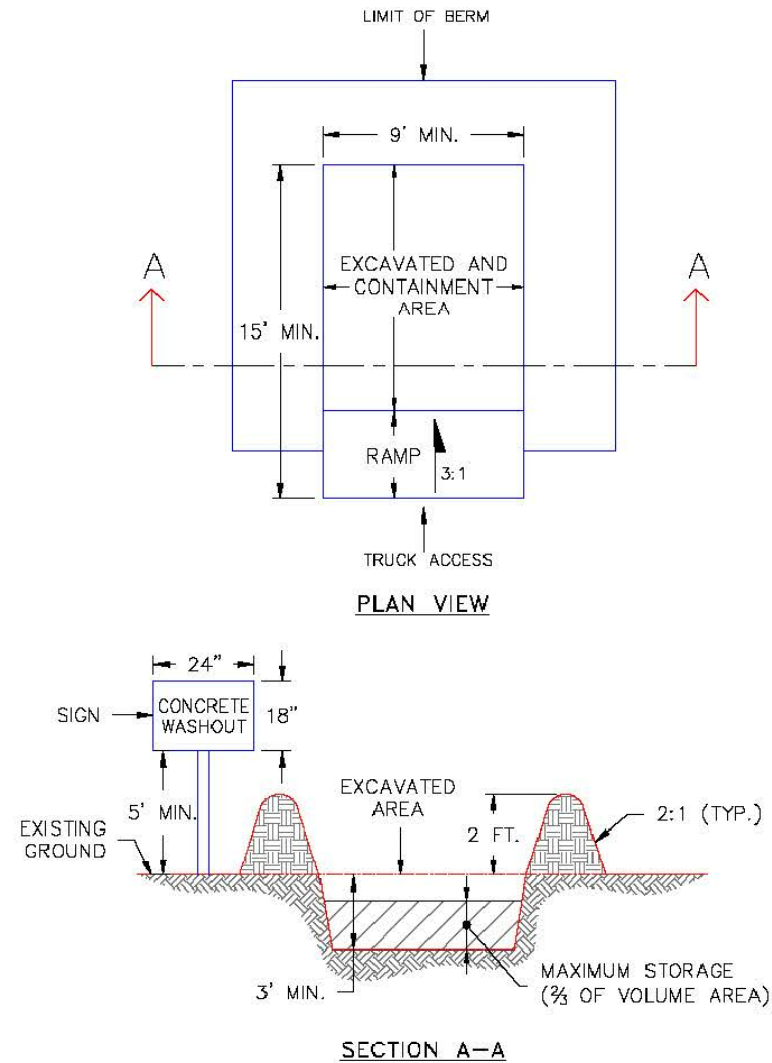
VEHICLE TRACKING PAD DETAIL
N.T.S.

INSTALLATION REQUIREMENTS:

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

MAINTENANCE REQUIREMENTS

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



- NOTES:
1. SIGN MATERIAL, EXCAVATION, AND RESTORATION ARE INCLUDED IN THE COST OF THE CONCRETE WASHOUT STRUCTURE.
 2. EROSION BALES MAY BE USED AS AN ALTERNATIVE FOR THE BERM.

1/1/08
DATE APPROVED:

John A. McCarty
DEPARTMENT OF TRANSPORTATION

Concrete Washout Structure
Standard Drawing

REVISION DATE: 7/17/07
FILE NAME: SD_3-84



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Project No.: 112.96
Date: 11/19/18
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LANDSCAPING NOTES:

1. **PLANT QUANTITY AND SUBSTITUTION:** IN CASE OF DISCREPANCY IN PLANT QUANTITIES SHOWN ON THE PLANT TABLE AND THOSE SHOWN ON THE PLANTING PLAN, THE QUANTITIES SHOWN ON THE PLANTING PLAN SHALL GOVERN. THE MINIMUM ACCEPTABLE SIZES OF PLANTS MEASURED BEFORE PRUNING WITH BRANCHES IN NORMAL POSITION SHALL CONFORM TO THE PLANTING SIZES AS SPECIFIED IN THE SCHEDULE. ANY SUBSTITUTION OF PLANT SIZE OR SPECIES MUST BE SUBMITTED TO THE ENGINEER IN WRITING FOR APPROVAL PRIOR TO INSTALLATION.
2. **ACCEPTABLE PLANT MATERIAL:** ALL PLANTS SHALL MEET OR EXCEED STANDARDS SET BY THE "COLORADO NURSERY ASSOCIATION," AND THE "AMERICAN STANDARD OF NURSERY STOCK." ALL PLANTS SHALL BE TYPICAL OF THEIR SPECIES, HEALTHY, FREE OF DISEASE, INSECT PESTS, MECHANICAL INJURIES, AND HAVE ADEQUATE ROOT SYSTEMS. ALL PLANTINGS SHALL BE INSTALLED PER PLANTING DETAILS. ALL PLANT MATERIAL SHALL BE INSPECTED BY THE ENGINEER OR OWNER PRIOR TO INSTALLATION. STAKING/CONTRACTOR INSPECTION NOTE: ALL PLANTING LOCATIONS TO BE STAKED AND INSPECTED BY CONTRACTOR PRIOR TO INSTALLATION. ALL PLANTS TO BE INSPECTED AT NURSERY LOCATION PRIOR TO TRANSPORTING TO THE SITE.
3. **SITE DISTURBANCE:** ALL AREAS OF SITE DISTURBANCE DUE TO CONSTRUCTION SHALL BE RENOVATED OR PLANTED PER THIS PLAN UNLESS OTHERWISE NOTED.
4. **SOIL AMENDMENTS:** CONTRACTOR SHALL AMENDED PLANTING AREAS AS FOLLOWS:
-ADD MINIMUM OF 3 CUBIC YARDS OF WELL-COMPOSTED AGED MANURE OR PREMIUM COMPOST PER 1000 S.F.
-ALL AMENDED AREAS SHALL BE TILLED TO A DEPTH OF 6" PRIOR TO PLANTING.
-3 CUBIC YARDS PER 1000 S.F. OF WELL-COMPOSTED AGED MANURE OR PREMIUM COMPOST.
-ALL AMENDED AREAS SHALL BE TILLED TO A DEPTH OF 6" PRIOR TO PLANTING.
5. **SEEDED TURF:** ALL SEEDED OR HYDROMULCHED AREAS SHALL DEMONSTRATE 95% GERMINATION PRIOR TO FINAL ACCEPTANCE.
6. **IRRIGATION:** OWNER TO HAND WATER FOR ONE TO TWO GROWING SEASONS UNTIL ESTABLISHED AND ON AN AS-NEEDED BASIS THEREAFTER. DISTURBED AREA SEED/GRASS MIXTURE MUST BE IRRIGATED BY OWNER UNTIL ESTABLISHED AND IN TIMES OF DROUGHT. THE ON-GOING MAINTENANCE OF THE NATIVE GRASS IS THE RESPONSIBILITY OF OWNER.
7. **INORGANIC MULCH AND FABRIC:** ALL PLANTINGS TO RECEIVE 3-INCH DEPTH OF INORGANIC MULCH. MULCH RINGS TO BE 15-INCH DIA. FOR (5) GALLON SHRUBS/GRASSES (SEE DETAIL X/X). HIGH QUALITY COMMERCIAL-GRADE (SPUN-BONDED POLYPROPYLENE OR EQUAL) LANDSCAPING FABRIC SHALL BE APPLIED UNDER ALL ROCK BASES.
8. **STEEL EDGE:** ALL EDGER SHALL BE ACME 4" PERFORATED STEEL EDGER "SELF COLORING" 14 GAUGE OR APPROVED EQUAL.
9. **APPROVAL:** ANY FIELD CHANGES OR DEVIATIONS TO THESE PLANS WITHOUT PRIOR APPROVAL OF AN AMENDED DEVELOPMENT PLAN MAY RESULT IN A DELAY OF FINAL APPROVAL AND THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY.
10. **FINAL TREE AND SHRUB LOCATIONS:** ALL TREE LOCATIONS SHALL BE STAKED FOR APPROVAL BY OWNER REPRESENTATIVE/ENGINEER PRIOR TO PLANTING. SHRUBS SHALL BE PLACED IN THEIR LOCATIONS PER THIS PLAN AND APPROVED BY OWNER REPRESENTATIVE/ENGINEER. THE FINAL LOCATION OF TREES TO BE PLANTED MAY REQUIRE ADJUSTMENT BASED ON APPROVAL OF THE FINAL UTILITIES PLANS AND ASSOCIATED FINAL PLAT AND EASEMENTS.

* BY APPROVING THIS PLAN, THE DIRECTOR IS APPROVING AN ALTERNATE LANDSCAPING DESIGN AS IT RELATES AND CONFORMS TO HOMELAND SECURITY STANDARDS AND PROMOTES WATER CONSERVATION WHILE MEETING THE PURPOSES DESCRIBED IN THE LAND DEVELOPMENT CODE.

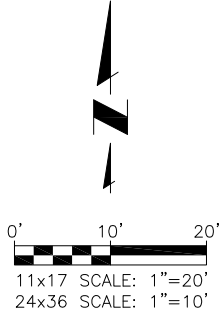
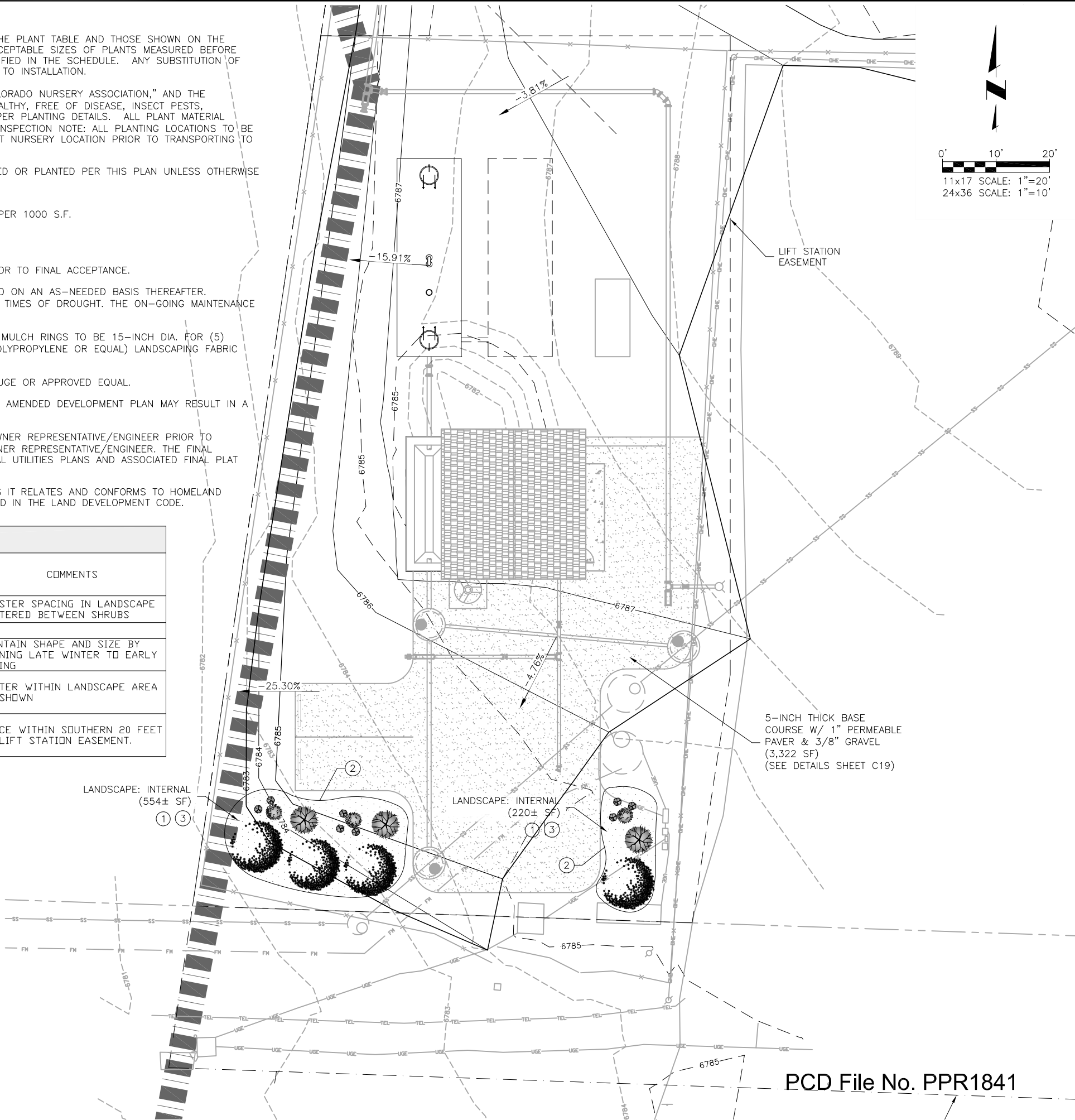
SCHEDULE - XERIC/LOW WATER VEGETATION

SYMBOL	BOTANICAL NAME	COMMON NAME	QTY.	MATURE SIZE	PLANTING SIZE (MIN.)	COMMENTS
	GRASS					
	SCHIZACHRIUM SCOPARIUM	LITTLE BLUESTEM	8	2'-0" x 1'-6"	#3 CONT.	CLUSTER SPACING IN LANDSCAPE CENTERED BETWEEN SHRUBS
	SHRUB					
	CERCOCARPUS MONTANUS	MOUNTAIN MAHOGANY	3	5'-0" x 4'-0"	#5 CONT.	MAINTAIN SHAPE AND SIZE BY PRUNING LATE WINTER TO EARLY SPRING
	POTENTILLA FRUTICOSA	GOLDSTAR POTENTILLA	3	2'-6" x 3'-0"	#5 CONT.	CENTER WITHIN LANDSCAPE AREA AS SHOWN
	JUNIPERUS CHNENSIS "BLUE POINT"	BLUE POINT JUNIPER	4	8 FT.	1-INCH CAL.	PLACE WITHIN SOUTHERN 20 FEET OF LIFT STATION EASEMENT.

- ① TYP SHRUB/GRASS PLANTING - REF: DETAIL A/C19
- ② STEEL EDGE, TYP FOR SEPARATION BETWEEN TURF, GRAVEL/MULCH, AND BASECOURSE AREAS - REF: DETAIL B/C19
- ③ MULCH @ 3" DEPTH MIN.

LANDSCAPING

INTERNAL	
NET SITE AREA	14,365 S.F.
% MINIMUM INTERNAL AREA	5
INTERNAL AREA REQUIRED/PROVIDED	718 S.F. / 774 S.F.
PARKING LOT LANDSCAPE (N/A)	
ROAD FRONTAGE	
FALCON HWY (MINOR ARTERIAL)	93 LF
FRONTAGE WIDTH REQUIRED/PROVIDED	20' / 20'
NUMBER OF TREES REQUIRED @ 1/25 LF/PROVIDED	4 / 4



WOODMEN HILLS METROPOLITAN DISTRICT

LIFT STATION #1 REPLACEMENT

LANDSCAPING PLAN & NOTES

JDS-HYDRO CONSULTANTS, INC.
545 EAST PIKES PEAK AVENUE, SUITE 300
COLORADO SPRINGS, COLORADO 80903
(719) 227-0072

DISCLAIMER: THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS. ANY ERRORS OR OMISSIONS SHALL BE REPORTED TO JDS-HYDRO CONSULTANTS, INC. JDS-HYDRO, A S U L C, HAS NO LIABILITY FOR UNAUTHORIZED CHANGES AND/OR REVISIONS MADE TO PLANS.

NO.	DESCRIPTION	BY	DATE
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100% DESIGN DRAWINGS

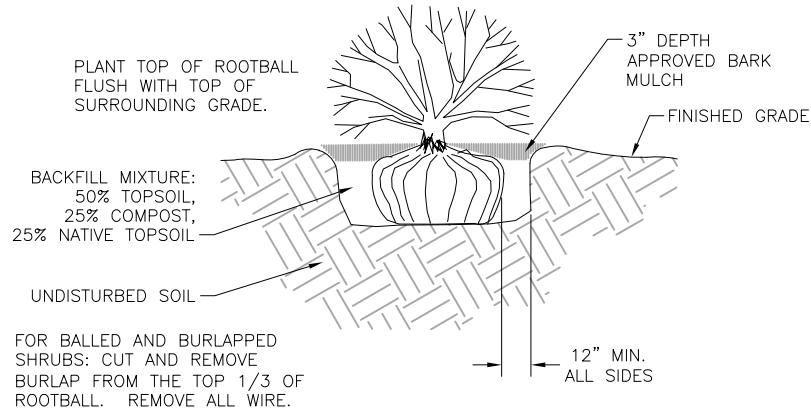


Project No.: 112.96
Date: 11/19/18
Design: RMM
Drawn: RMM
Check: DES

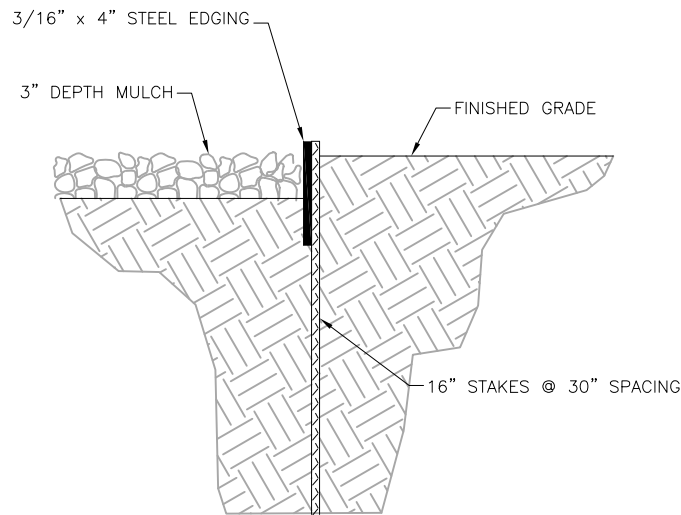
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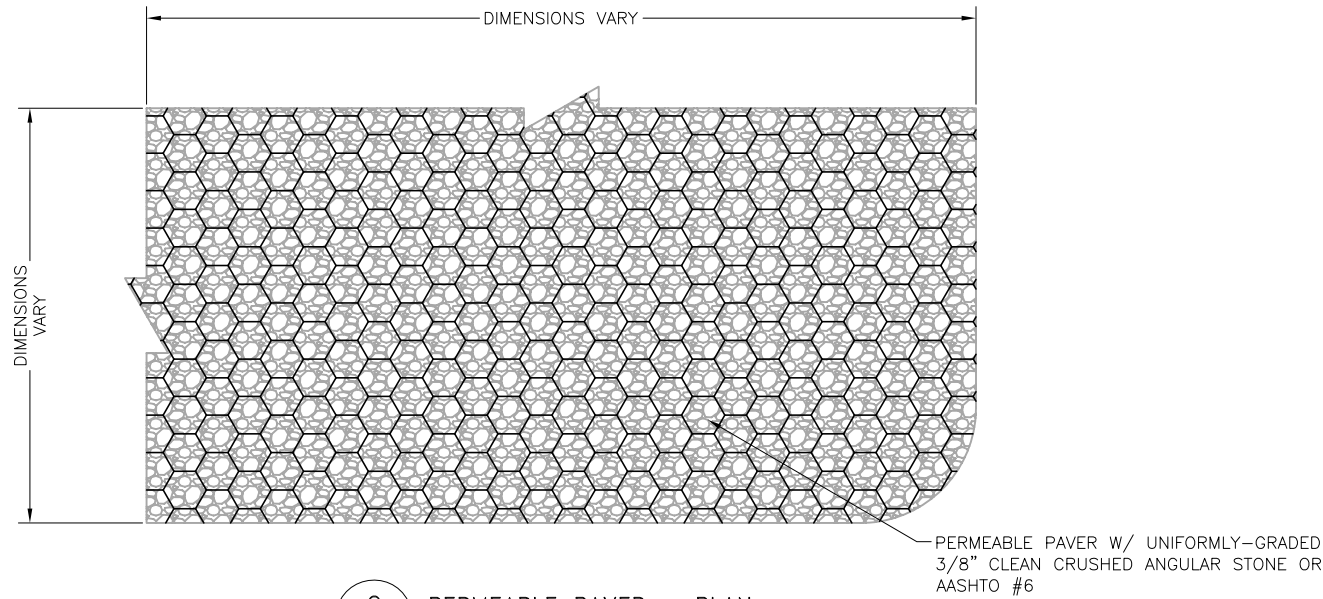
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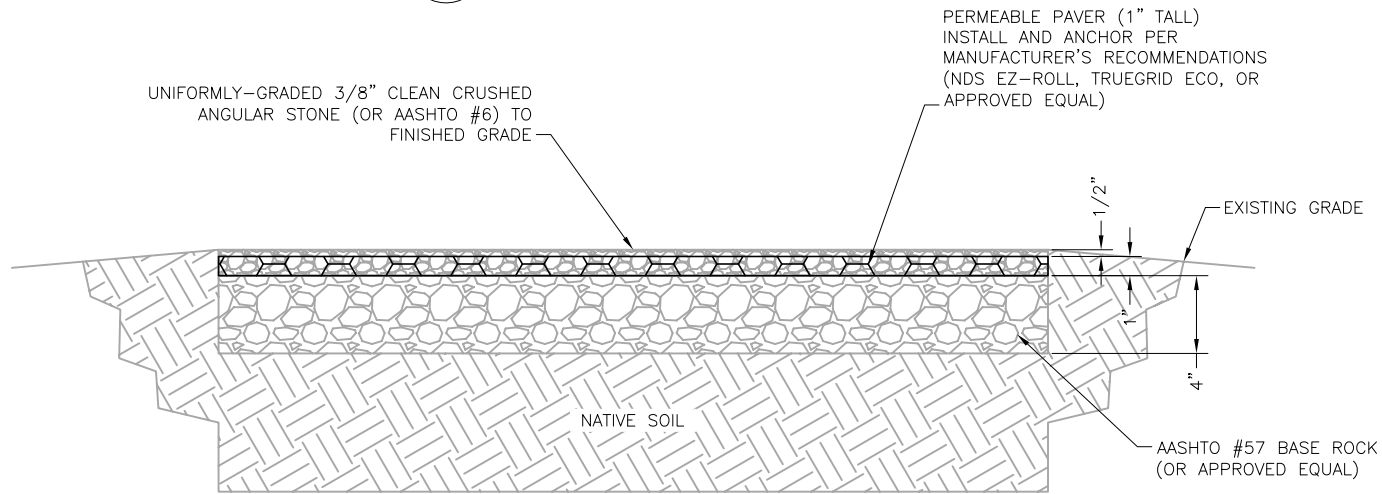
A SHRUB DECORATIVE GRASS PLANTING DETAIL
SCALE: N.T.S.



B STEEL EDGE DETAIL
SCALE: N.T.S.



C PERMEABLE PAVER - PLAN
SCALE: N.T.S.



D PERMEABLE PAVER - SECTION
SCALE: N.T.S.

PERMEABLE PAVER NOTES:

ENGINEERING PROPERTIES:

1. COMPRESSIVE STRENGTH:
EMPTY PAVERS: ULTIMATE LOAD = 53,683 LBS / 373 PSI
FILLED PAVERS: ULTIMATE LOAD = 500,000 LBS
2. POROSITY OF AASHTO #57 AGGREGATE = 0.4

GRAVEL FILL:

3. UNIFORMLY-GRADED 3/8" CLEAN CRUSHED ANGULAR STONE OR AASHTO #6.
4. EXTEND 3/8" GRAVEL INSIDE PAVER AN ADDITIONAL 1/2 INCH ABOVE PAVER SURFACE AND MATCH SURROUNDING GRADE. PROPOSED FINISHED GRADE SLOPE PER PROJECT GRADING PLAN.
5. PROVIDE 1" (MIN.) CLEARANCE BETWEEN ANY CONCRETE EDGE AND PAVER.

AASHTO #57 BASE ROCK:

6. GRADATION OF AASHTO #57 COARSE BASE ROCK: 100% PASSING 1-1/2" SCREEN, 95-100% PASSING 1", 25-60% PASSING 1/2", AND 0-10% PASSING #8 SCREEN.
7. THICKNESS OF AGGREGATE LAYER IS AS FOLLOWS: NO BASE REQUIRED FOR EROSION CONTROL AND PEDESTRIAN-ONLY LOADS
8. COMPACTION OF NATIVE SOIL RECOMMENDED FOR SLOPES UP TO 3%; 4 INCHES FOR LIGHT LOADS (GOLF CARTS); 6 INCHES FOR MEDIUM LOADS (CARS AND PICKUP TRUCKS); 8 INCHES FOR HEAVY LOADS (FIRE TRUCKS).
9. COMPACT WITH ONE TO THREE PASSES OF 5-TON STEEL WHEEL ROLLER. SINCE IT IS DIFFICULT TO MEASURE DENSITY OF COARSE AGGREGATE, APPROACH OF REQUIRING A FIXED DENSITY IS NOT APPLICABLE.

SUBGRADE NATIVE SOIL:

10. COMPACT SUBGRADE NATIVE SOILS TO 95% STANDARD PROCTOR DENSITY PER ASTM D696
11. CONSULT WITH PROJECT GEOTECHNICAL ENGINEER FOR POTENTIAL SOIL MODIFICATION (EG. LIME TREATMENT) AND COMPACTION LEVEL FOR CBR <5% AND R-VALUE <10, AASHTO A-5, A-6, AND A-7 SOILS.

PCD File No. PPR1841

NO.	REVISIONS		DATE
	DESCRIPTION	BY	
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100% DESIGN
DRAWINGS



Project No.: 112.96
Date: 11/19/18
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Check: DES