

El Paso County
STORMWATER MANAGEMENT PLAN

**Lots 2 and 3 Rolling Thunder
Business Park**

Part of the NE 1/4, Sec. 11, T. 13 S., R. 65 W., 6th P.M.

Item Numbers refer to SWMP Checklist

Item 1. Add Qualified Stormwater Manager and Contractor information to cover/title sheet. If unknown, add a placeholder to be updated prior to the pre-construction meeting:

June 3, 2020

QUALIFIED STORMWATER MANAGER

Name: _____
Company: _____
Address: _____

prepared for

Jesse and Sherrie Tix

CONTRACTOR

Name: _____
Company: _____
Address: _____

Oliver E. Watts, Consulting Engineer, Inc.
Colorado Springs, Colorado

OLIVER E. WATTS, PE-LS
OLIVER E. WATTS, CONSULTING ENGINEER, INC.
CIVIL ENGINEERING AND SURVEYING
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fax (719) 265-9660
olliewatts@aol.com
Celebrating over 41 years in business

June 3, 2020

El Paso County D.O.T.
3275 Akers Drive
Colorado Springs, CO 80922

ATTN: Permits Unit

SUBJECT: Stormwater Management Plan
Lots 2 and 3 Rolling Thunder Business Park

Transmitted herewith for your review and approval is the SWMP for the Lots 2 and 3 Rolling Thunder Business Park.

Please contact our office if we may provide any further information.

Oliver E. Watts, Consulting Engineer, Inc.

BY: _____
Erik S. Watts, Authorized Representative
Erosion Control Supervisor

The developer / owner has read and will comply with all of the requirements specified in this stormwater management report.

By: _____
Sherrie Tix
12027 Norma Kate Lane
Peyton, CO 80831-8661

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7. FEMA Panel No. 08041C0752 G, dated December 7, 2018
8. SCS Soils Map and Interpretation Sheet
9. Backup Information, 4 pages
10. Grading and Erosion Control Plans

Item 2. Provide usable TOC with section headings and page numbers for the report.

1. SITE DESCRIPTION:

Lots 2 and 3 Rolling Thunder Business Park is located at 10658 and 10634 Maltese Point, on the south side of Woodmen Road, just east of Falcon Meadows Boulevard in the Northeast Quarter of Section 11, Township 13 South, Range 65 West of the 6th P.M., in El Paso County. The overall Site totals 1.015 acres. Grading is also to occur on 0.881 acres of the lot.

Lat: 38° 56' 25.21237 " N

Long: 104° 37' 47.35622 " W

a) **Construction activity description:** Construction activity for the site will include; overlot grading, and construction of a commercial building and parking lot. The site will be landscaped / reseeded once all construction has been completed.

b) **Sequence / time line of activities:** The site will be overlot graded per the enclosed grading plan. All site grading is to be in compliance with El Paso County Code. Grading for the site, is scheduled to be completed by summer 2021. Total site landscaping / reseeded should be completed and acceptable ground cover / vegetation established by late August 2021.

note: achieving 70% vegetation cover usually takes about 1 year

c) **Site area:** The site is 1.015 acres total. It is part of the larger, 15.747 acre Rolling Thunder Business Park subdivision. The portion of the site that is to experience grading is approximately 0.881 acres. The Site is vegetated with grasses, and some scrub brush: Approximately 85% of the site has some form of vegetation on it. Said vegetation, is outside of / off of Maltese Point. The site is to be graded so as to comply with the Grading and Erosion Control Plans, which accompany the submittal.

d) **Runoff:** Overall runoff from the Site will remain at historic levels. Attached is the "Description of Runoff" section from the lots drainage letter:

...this Site was previously platted as the Rolling Thunder Business Park. At that time a drainage report was submitted and approved by El Paso County, Colorado. This lot has been zoned for industrial or commercial uses since that time, and runoff was computed on that basis. The subdivision lays South of Woodmen on the North side of Maltese Drive. Runoff is divided by a high point in the existing curb and gutter where shown on the drainage plan.

Basins O-1 and O-2 are the inflows to the subdivision from adjacent Woodmen Road, south of the centerline of the pavement. 0.5 cfs / 0.9 cfs (5-year / 100-year runoffs) will flow into the subdivision in each basin. This will combine with the runoff from each half of the development and exit to the West and East long the north curb line of Maltese Drive. The combined runoff exiting the subdivision is 1.6/3.3 cfs westerly and 1.9/4.0 cfs easterly, well within the capacity of the roadway. The runoff is unchanged from that developed by the existing zoning at the time of the original subdivision, and no harm will be incurred to downstream facilities.

This parcel is not within the limits of a designated flood plain or flood hazard area, as identified on FEMA Panel No. 08041C0752 G, dated December 7, 2018, a copy of which is enclosed for reference.

The method used for all computations is that specified in the City-County Drainage Criteria Manual, using the rational method for areas of the size of the site and the SCS method for the review of the major basin involved. All computations are enclosed for reference and review.

The local USDA/SCS office has mapped the soils in the area. A soils map interpretation sheet is enclosed for reference. All soils in this area are of hydrologic group "A", Blakeland Series. It has slow surface water runoff, but high erodability and moderate blowing (wind) hazard, and is listed as having high potential for successful reseeding, especially with 'native' grasses. Potential erosion impacts would affect Maltese Point. Runoff would be carried down the slopes and into the street. Erosion control measures, silt fencing, and reseeding will serve to mitigate this hazard. See page 2, Erosion Control Plan for details.

e) **Existing vegetation:** As stated previously; Item 1, C "Site Area," vegetation consists of grasses, and some scrub brush. Approximately 85% of the site has some form of vegetation on it. Per the enclosed Grading and Erosion Control Plans: The area is to be graded as shown and erosion control measures, as shown, and listed in said Plans implemented. Item 9. Include method used to determine ground cover (i.e., visual, aerial inspection)

f) **Potential pollution sources:** None are known to exist.

g) **Non stormwater discharge:** No springs are known to exist. Any additional discharge is confined to the surface and runoff routed to the subdivision detention pond.

This addresses Item 14. Change from "n/a" to "x" on SWMP Checklist

h) **Receiving water(s), size, type and description of outfall(s):** Sand Creek and ultimately Fountain Creek is the receiving water for stormwater discharge from this Site. Outfalls are shown on the enclosed grading plan. Item 16. Note that no streams cross the project area.

2. SITE MAP:

Enclosed are a vicinity map and grading and erosion control plans for review. Details for the BMP's are shown of the plans.

3. BMPs FOR STORMWATER POLLUTION PREVENTION:

a) **Erosion and sediment controls:**

1) **Structural practices:** As indicated on the enclosed Grading and Erosion Control Plans, erosion will be contained through the use of said silt fencing. See Plans for Phases, locations and details on silt fencing. The portion of the lot that has experienced grading will be landscaped or reseeded per County Code (see DCM Volume II for details).

Item 10 & 13. This work will have some Pollution Sources. See Item 10 & 13 on the SWMP Checklist for examples. Please add a bulleted list with a description for each source.

2) **Non-Structural practices:** Permanent stabilization practices will be implemented on this Site through landscaping and reseeded. Said seeding activities will occur when all grading / construction for the site is finished. See the enclosed Grading and Erosion Control Plans for details.

b) **Materials handling and Spills Prevention:** There are no plans to have any On-Site batch plant(s). Vehicle refueling will take place away from areas containing or conveying water, or near the existing road, in accordance with State approved practices. Should a fuel or fluid spill occur, the contractor will follow County and State guidelines concerning spills such as; berming the area around the spill and remove all contaminated soil in an approved container and disposing of said container at a County / State approved facility / Site.

Item 11. Need to address all potential pollution sources handling and spill prevention/ response plan and procedures.

4. FINAL STABILIZATION AND LONG TERM STORMWATER MANAGEMENT:

As stated earlier, copies of the Grading and Erosion Control Plans are submitted for your review. These Plans should adequately address this section. Our office will have inspectors monitoring the Site during construction to insure compliance with applicable State and El Paso County Code(s). The Permittee will contact your office upon final stabilization, once the erosion control measures have been removed and the vegetation / ground cover reaches 70% of pre-disturbance levels. See re-seed section, page 7, for suggested final stabilization seed mix, for areas outside the landscaping.

Item 22. Final stabilization of 70% should be achieved, then reach out to EPC for an inspection. When EPC agrees that 70% vegetation has been achieved, you can remove the temporary BMPs. Discuss the existing water treatment facility that will treat the site stormwater.

5. OTHER CONTROLS:

Please review the enclosed Grading and Erosion Control Plan. It details said controls. Waste disposal will be in accordance with El Paso County standards. A rock mat (VTC) will be installed where shown on the grading plan to remove any soil from vehicles before entering Maltese Point.

The Qualified Stormwater Manager (QSM)

6. INSPECTION AND MAINTENANCE:

~~The owners, the excavator, as well as this office~~ will monitor the day to day Site activities during construction. A copy of this report will be kept in the vehicle of said inspector. add: "and/or snow melt

Item 25. add "signed"

Inspections will occur and reports will be filled out every 14 days, and/or after a precipitation event as required, to ensure adequate operation and design of selected BMP's. Copies of said inspection reports will be kept in the aforementioned vehicles and at this office. Silt fencing will need to be replaced and/or repaired as need be. All litter and debris should be removed from the lot and disposed off of the site (i.e. in a trash bag, trash can, dumpster).

by the QSM

by the permit holder

7. SWMP REVISION PROCEDURES:

This SWMP should be revised as necessary to address the various phases of grading, construction, and changing site conditions and BMP needs.

The need for revision could include the following: Continued overlot grading, removal of one of

more BMP as items are completed, the weather and precipitation could affect and cause a needed revision in the SWMP. This office will revise accordingly.

The QSM

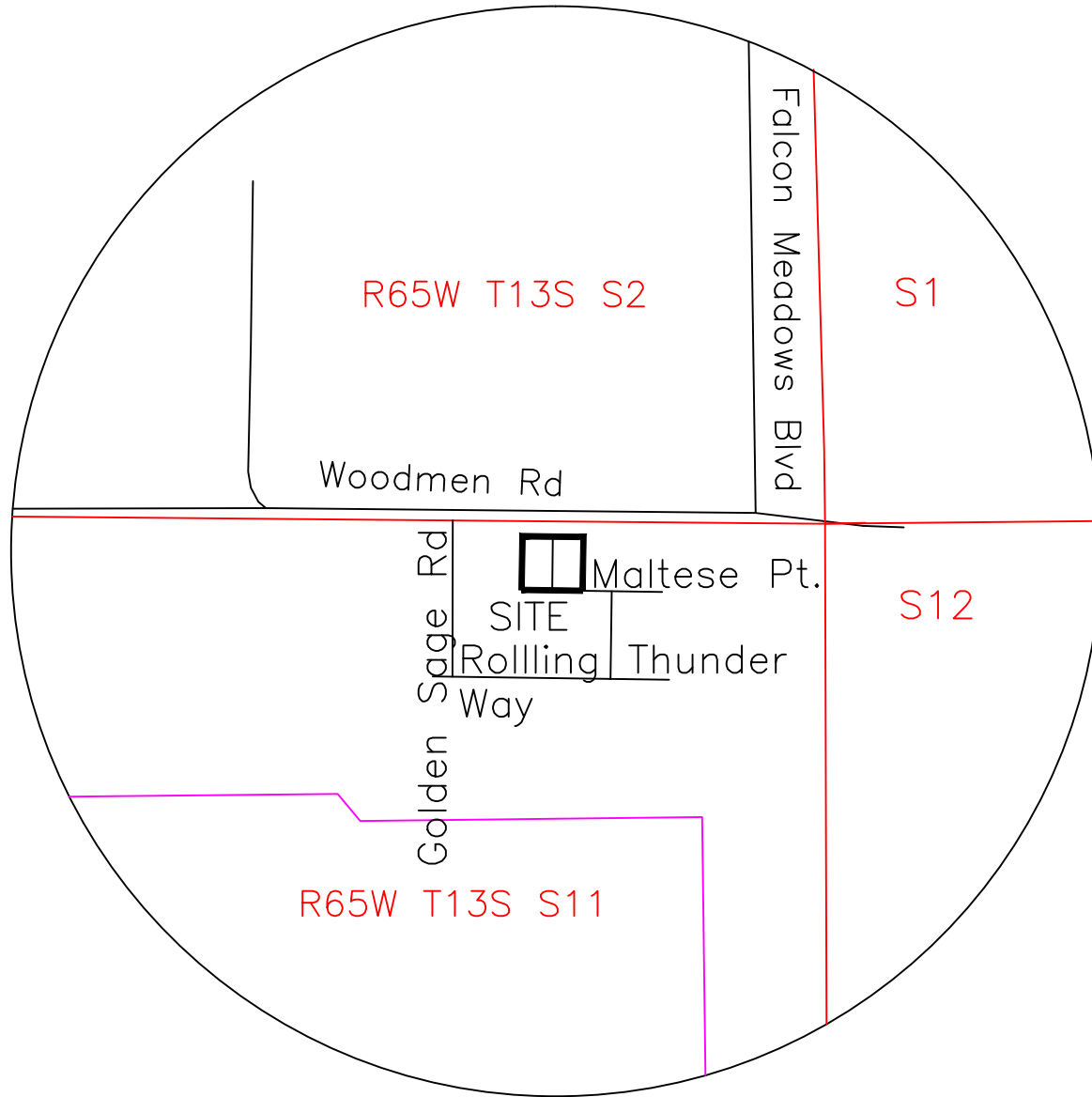
8. FINAL STABILIZATION:

Re-seed mixture

All disturbed areas shall be re-graded and, those areas not covered by landscaping could be reseeded with the following native grass mixture for sandy soils:

| GRASS | VARIETY | AMOUNT IN PLS LBS PER ACRE |
|---------------------|----------------|-----------------------------------|
| Sideoats Grama | El Reno | 3.0 Lbs |
| Western Wheatgrass | Barton | 2.5 Lbs |
| Slender Wheat Grass | Native | 2.0 Lbs |
| Little Bluestem | Pastura | 2.0 Lbs |
| Sand Dropseed | Native | 0.5 Lbs |
| Switch Grass | Nebraska 28 | 3.0 Lbs |
| Weeping Love Grass | Morpha | 1.0 Lbs |

Item 26. Add a note stating that this project does not rely on control measures owned or operated by another entity.



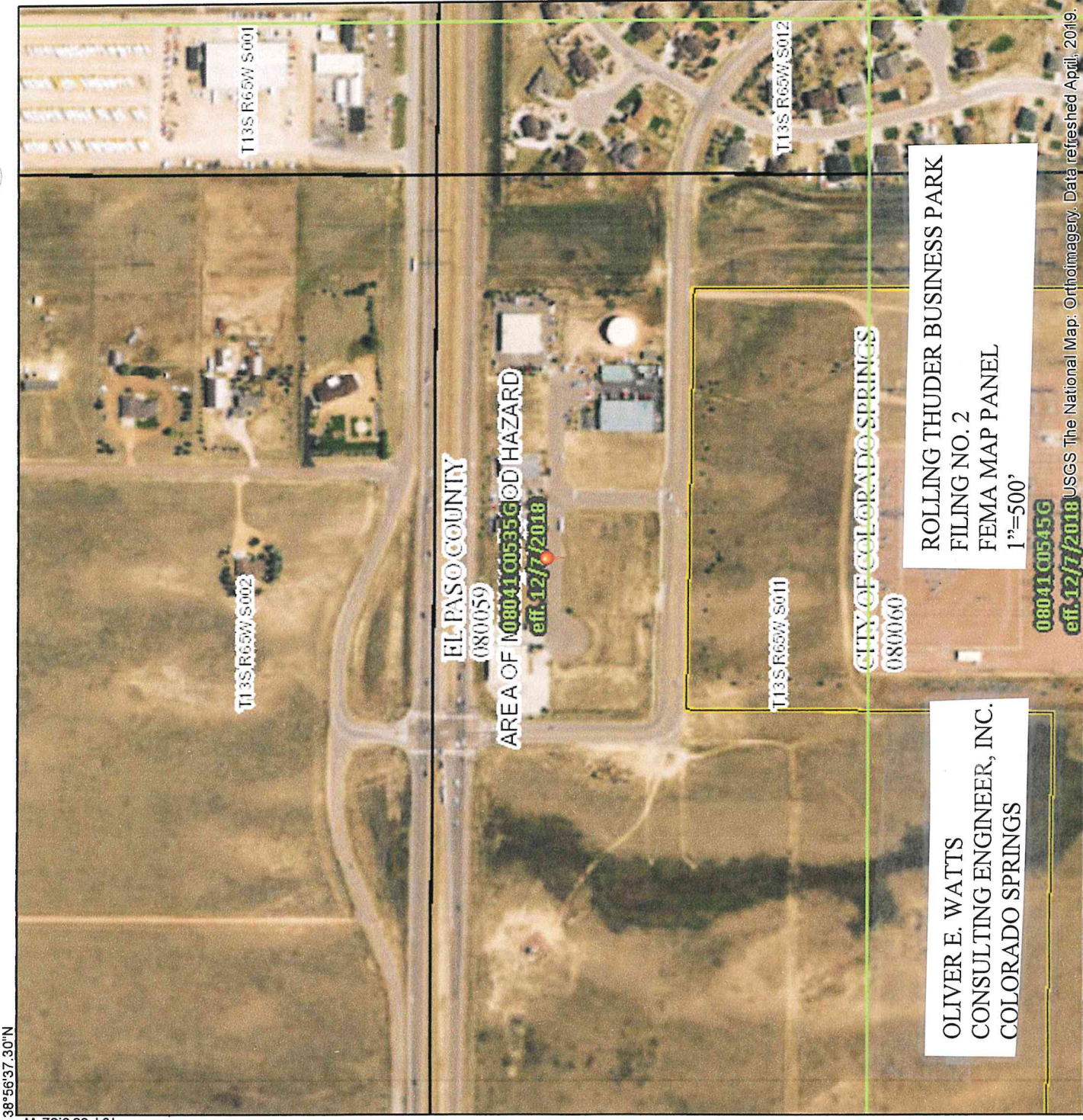
VICINITY MAP

NOT TO SCALE

National Flood Hazard Layer FIRMette



38°56'37.30"N



104°37'29.37"W

Legend

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

- SPECIAL FLOOD HAZARD AREAS**
- Without Base Flood Elevation (BFE) Zone A, V, A99
 - With BFE or Depth Zone AE, AO, AH, VE, AR
 - Regulatory Floodway
- OTHER AREAS OF FLOOD HAZARD**
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
 - Future Conditions 1% Annual Chance Flood Hazard Zone X
 - Area with Reduced Flood Risk due to Levee, See Notes, Zone X
 - Area with Flood Risk due to Levee Zone D

- OTHER AREAS**
- Area of Minimal Flood Hazard Zone X
 - Effective LOMRs
 - Area of Undetermined Flood Hazard Zone I
- GENERAL STRUCTURES**
- Channel, Culvert, or Storm Sewer
 - Levee, Dike, or Floodwall

- OTHER FEATURES**
- Cross Sections with 1% Annual Chance Water Surface Elevation
 - Coastal Transect
 - Base Flood Elevation Line (BFE)
 - Limit of Study
 - Jurisdiction Boundary
 - Coastal Transect Baseline
 - Profile Baseline
 - Hydrographic Feature

- MAP PANELS**
- Digital Data Available
 - No Digital Data Available
 - Unmapped

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

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

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 1/22/2020 at 12:00:29 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

OLIVER E. WATTS
CONSULTING ENGINEER, INC.
COLORADO SPRINGS

ROLLING THUNDER BUSINESS PARK
FILING NO. 2
SOILS MAP
1"=2000'

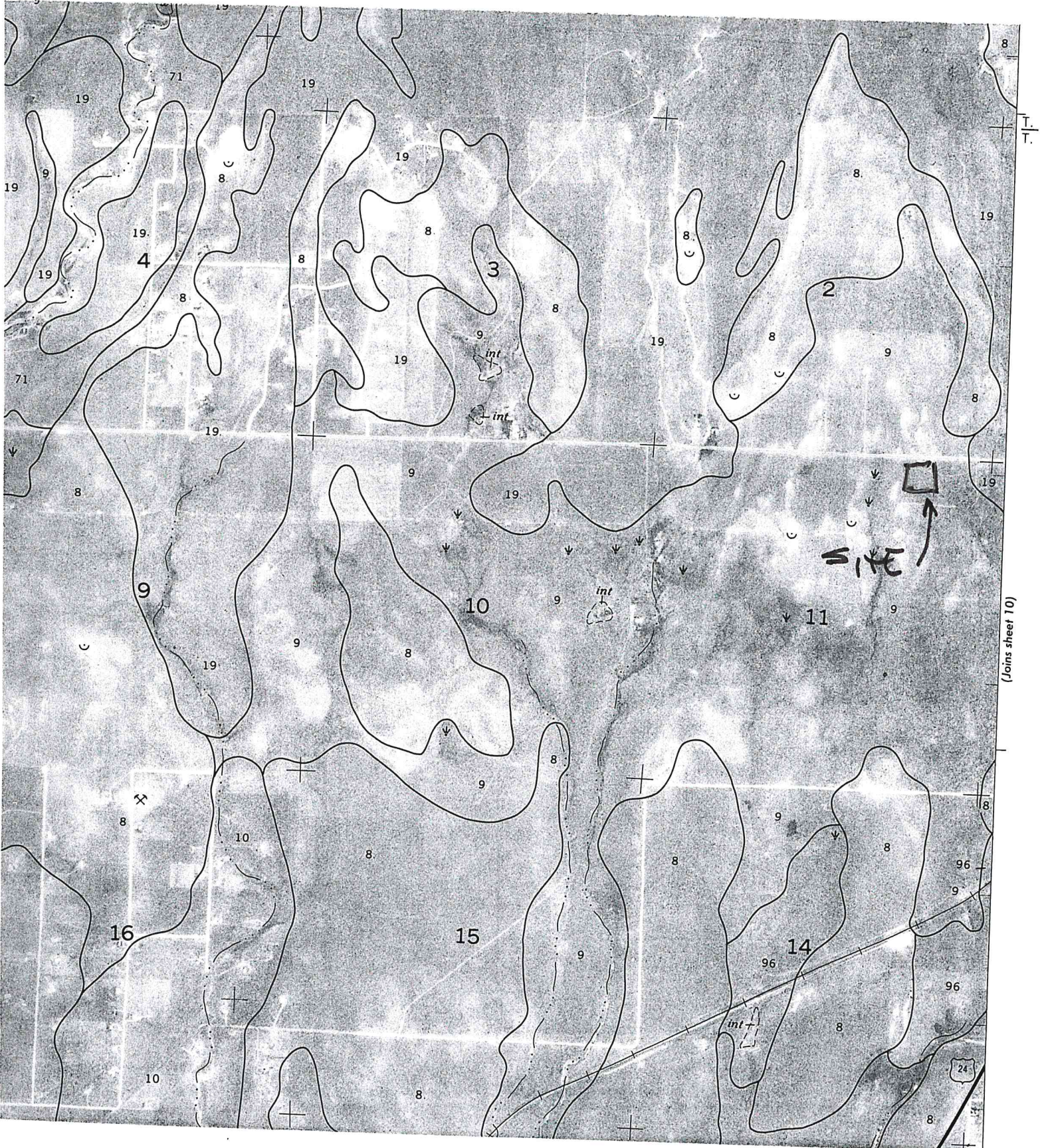


TABLE 16.--SOIL AND WATER FEATURES

[Absence of an entry indicates the feature is not a concern. See "flooding" in Glossary for definition of terms as "rare," "brief," and "very brief." The symbol > means greater than]

| Soil name and map symbol | Hydro-logic group | Flooding | | | Bedrock | | Potential frost action |
|---|-------------------|---------------|----------------|---------|------------------|----------|------------------------|
| | | Frequency | Duration | Months | Depth | Hardness | |
| Alamosa: 1----- | C | Frequent----- | Brief----- | May-Jun | <u>In</u> >60 | --- | High. |
| Ascalon: 2, 3----- | B | None----- | --- | --- | >60 | --- | Moderate. |
| Badland: 4----- | D | --- | --- | --- | --- | --- | --- |
| Bijou: 5, 6, 7----- | B | None----- | --- | --- | >60 | --- | Low. |
| Blakeland: 8----- | A | None----- | --- | --- | >60 | --- | Low. |
| 19: Blakeland part----- | A | None----- | --- | --- | >60 | --- | Low. |
| Fluvaquentic Haplaquolls part----- | D | Common----- | Very brief---- | Mar-Aug | >60 | --- | High. |
| Blendon: 10----- | B | None----- | --- | --- | >60 | --- | Moderate. |
| Bresser: 11, 12, 13----- | B | None----- | --- | --- | >60 | --- | Low. |
| Brussett: 14, 15----- | B | None----- | --- | --- | >60 | --- | Moderate. |
| Chaseville: 16, 17----- | A | None----- | --- | --- | >60 | --- | Low. |
| 118: Chaseville part----- | A | None----- | --- | --- | >60 | --- | Low. |
| Midway part----- | D | None----- | --- | --- | 10-20 | Rippable | Moderate. |
| Columbine: 19----- | A | None to rare | --- | --- | >60 | --- | Low. |
| Connerton: 120: Connerton part----- | B | None----- | --- | --- | >60 | --- | High. |
| Rock outcrop part----- | D | --- | --- | --- | --- | --- | --- |
| Cruckton: 21----- | B | None----- | --- | --- | >60 | --- | Moderate. |
| Cushman: 22, 23----- | C | None----- | --- | --- | 20-40 | Rippable | Moderate. |
| 124: Cushman part----- | C | None----- | --- | --- | 20-40 | Rippable | Moderate. |
| Kutch part----- | C | None----- | --- | --- | 20-40 | Rippable | Moderate. |
| Elbeth: 25, 26----- | B | None----- | --- | --- | >60 | --- | Moderate. |
| 127: Elbeth part----- | B | None----- | --- | --- | >60 | --- | Moderate. |

See footnote at end of table.

Table 6-6. Runoff Coefficients for Rational Method
(Source: UDFCD 2001)

| Land Use or Surface Characteristics | Percent Impervious | Runoff Coefficients | | | | | | | | | | | |
|--|--------------------|---------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|---------|
| | | 2-year | | 5-year | | 10-year | | 25-year | | 50-year | | 100-year | |
| | | HSG A&B | HSG C&D | HSG A&B | HSG C&D | HSG A&B | HSG C&D | HSG A&B | HSG C&D | HSG A&B | HSG C&D | HSG A&B | HSG C&D |
| Business | | | | | | | | | | | | | |
| Commercial Areas | 95 | 0.79 | 0.80 | 0.81 | 0.82 | 0.83 | 0.84 | 0.85 | 0.87 | 0.87 | 0.88 | 0.88 | 0.89 |
| Neighborhood Areas | 70 | 0.45 | 0.49 | 0.49 | 0.53 | 0.53 | 0.57 | 0.58 | 0.62 | 0.60 | 0.65 | 0.62 | 0.68 |
| Residential | | | | | | | | | | | | | |
| 1/8 Acre or less | 65 | 0.41 | 0.45 | 0.45 | 0.49 | 0.49 | 0.54 | 0.54 | 0.59 | 0.57 | 0.62 | 0.59 | 0.65 |
| 1/4 Acre | 40 | 0.23 | 0.28 | 0.30 | 0.35 | 0.36 | 0.42 | 0.42 | 0.50 | 0.46 | 0.54 | 0.50 | 0.58 |
| 1/3 Acre | 30 | 0.18 | 0.22 | 0.25 | 0.30 | 0.32 | 0.38 | 0.39 | 0.47 | 0.43 | 0.52 | 0.47 | 0.57 |
| 1/2 Acre | 25 | 0.15 | 0.20 | 0.22 | 0.28 | 0.30 | 0.36 | 0.37 | 0.46 | 0.41 | 0.51 | 0.46 | 0.56 |
| 1 Acre | 20 | 0.12 | 0.17 | 0.20 | 0.26 | 0.27 | 0.34 | 0.35 | 0.44 | 0.40 | 0.50 | 0.44 | 0.55 |
| Industrial | | | | | | | | | | | | | |
| Light Areas | 80 | 0.57 | 0.60 | 0.59 | 0.63 | 0.63 | 0.66 | 0.66 | 0.70 | 0.68 | 0.72 | 0.70 | 0.74 |
| Heavy Areas | 90 | 0.71 | 0.73 | 0.73 | 0.75 | 0.75 | 0.77 | 0.78 | 0.80 | 0.80 | 0.82 | 0.81 | 0.83 |
| Parks and Cemeteries | | | | | | | | | | | | | |
| Parks and Cemeteries | 7 | 0.05 | 0.09 | 0.12 | 0.19 | 0.20 | 0.29 | 0.30 | 0.40 | 0.34 | 0.46 | 0.39 | 0.52 |
| Playgrounds | 13 | 0.07 | 0.13 | 0.16 | 0.23 | 0.24 | 0.31 | 0.32 | 0.42 | 0.37 | 0.48 | 0.41 | 0.54 |
| Railroad Yard Areas | 40 | 0.23 | 0.28 | 0.30 | 0.35 | 0.36 | 0.42 | 0.42 | 0.50 | 0.46 | 0.54 | 0.50 | 0.58 |
| Undeveloped Areas | | | | | | | | | | | | | |
| Historic Flow Analysis-- Greenbelts, Agriculture | 2 | 0.03 | 0.05 | 0.09 | 0.16 | 0.17 | 0.26 | 0.26 | 0.38 | 0.31 | 0.45 | 0.36 | 0.51 |
| Pasture/Meadow | 0 | 0.02 | 0.04 | 0.08 | 0.15 | 0.15 | 0.25 | 0.25 | 0.37 | 0.30 | 0.44 | 0.35 | 0.50 |
| Forest | 0 | 0.02 | 0.04 | 0.08 | 0.15 | 0.15 | 0.25 | 0.25 | 0.37 | 0.30 | 0.44 | 0.35 | 0.50 |
| Exposed Rock | 100 | 0.89 | 0.89 | 0.90 | 0.90 | 0.92 | 0.92 | 0.94 | 0.94 | 0.95 | 0.95 | 0.96 | 0.96 |
| Offsite Flow Analysis (when landuse is undefined) | 45 | 0.26 | 0.31 | 0.32 | 0.37 | 0.38 | 0.44 | 0.44 | 0.51 | 0.48 | 0.55 | 0.51 | 0.59 |
| Streets | | | | | | | | | | | | | |
| Paved | 100 | 0.89 | 0.89 | 0.90 | 0.90 | 0.92 | 0.92 | 0.94 | 0.94 | 0.95 | 0.95 | 0.96 | 0.96 |
| Gravel | 80 | 0.57 | 0.60 | 0.59 | 0.63 | 0.63 | 0.66 | 0.66 | 0.70 | 0.68 | 0.72 | 0.70 | 0.74 |
| Drive and Walks | | | | | | | | | | | | | |
| Drive and Walks | 100 | 0.89 | 0.89 | 0.90 | 0.90 | 0.92 | 0.92 | 0.94 | 0.94 | 0.95 | 0.95 | 0.96 | 0.96 |
| Roofs | | | | | | | | | | | | | |
| Roofs | 90 | 0.71 | 0.73 | 0.73 | 0.75 | 0.75 | 0.77 | 0.78 | 0.80 | 0.80 | 0.82 | 0.81 | 0.83 |
| Lawns | | | | | | | | | | | | | |
| Lawns | 0 | 0.02 | 0.04 | 0.08 | 0.15 | 0.15 | 0.25 | 0.25 | 0.37 | 0.30 | 0.44 | 0.35 | 0.50 |

3.2 Time of Concentration

One of the basic assumptions underlying the Rational Method is that runoff is a function of the average rainfall rate during the time required for water to flow from the hydraulically most remote part of the drainage area under consideration to the design point. However, in practice, the time of concentration can be an empirical value that results in reasonable and acceptable peak flow calculations.

For urban areas, the time of concentration (t_c) consists of an initial time or overland flow time (t_i) plus the travel time (t_t) in the storm sewer, paved gutter, roadside drainage ditch, or drainage channel. For non-urban areas, the time of concentration consists of an overland flow time (t_i) plus the time of travel in a concentrated form, such as a swale or drainageway. The travel portion (t_t) of the time of concentration can be estimated from the hydraulic properties of the storm sewer, gutter, swale, ditch, or drainageway. Initial time, on the other hand, will vary with surface slope, depression storage, surface cover, antecedent rainfall, and infiltration capacity of the soil, as well as distance of surface flow. The time of concentration is represented by Equation 6-7 for both urban and non-urban areas.

$$t_c = t_i + t_t \quad (\text{Eq. 6-7})$$

Where:

t_c = time of concentration (min)

t_i = overland (initial) flow time (min)

t_t = travel time in the ditch, channel, gutter, storm sewer, etc. (min)

3.2.1 Overland (Initial) Flow Time

The overland flow time, t_i , may be calculated using Equation 6-8.

$$t_i = \frac{0.395(1.1 - C_5)\sqrt{L}}{S^{0.33}} \quad (\text{Eq. 6-8})$$

Where:

t_i = overland (initial) flow time (min)

C_5 = runoff coefficient for 5-year frequency (see Table 6-6)

L = length of overland flow (300 ft maximum for non-urban land uses, 100 ft maximum for urban land uses)

S = average basin slope (ft/ft)

Note that in some urban watersheds, the overland flow time may be very small because flows quickly concentrate and channelize.

3.2.2 Travel Time

For catchments with overland and channelized flow, the time of concentration needs to be considered in combination with the travel time, t_t , which is calculated using the hydraulic properties of the swale, ditch, or channel. For preliminary work, the overland travel time, t_t , can be estimated with the help of Figure 6-25 or Equation 6-9 (Guo 1999).

$$V = C_v S_w^{0.5} \quad (\text{Eq. 6-9})$$

Where:

V = velocity (ft/s)

C_v = conveyance coefficient (from Table 6-7)

S_w = watercourse slope (ft/ft)

Table 6-7. Conveyance Coefficient, C_v

| Type of Land Surface | C_v |
|--------------------------------------|-------|
| Heavy meadow | 2.5 |
| Tillage/field | 5 |
| Riprap (not buried)* | 6.5 |
| Short pasture and lawns | 7 |
| Nearly bare ground | 10 |
| Grassed waterway | 15 |
| Paved areas and shallow paved swales | 20 |

*For buried riprap, select C_v value based on type of vegetative cover.

The travel time is calculated by dividing the flow distance (in feet) by the velocity calculated using Equation 6-9 and converting units to minutes.

The time of concentration (t_c) is then the sum of the overland flow time (t_i) and the travel time (t_t) per Equation 6-7.

3.2.3 First Design Point Time of Concentration in Urban Catchments

Using this procedure, the time of concentration at the first design point (typically the first inlet in the system) in an urbanized catchment should not exceed the time of concentration calculated using Equation 6-10. The first design point is defined as the point where runoff first enters the storm sewer system.

$$t_c = \frac{L}{180} + 10 \quad (\text{Eq. 6-10})$$

Where:

t_c = maximum time of concentration at the first design point in an urban watershed (min)

L = waterway length (ft)

Equation 6-10 was developed using the rainfall-runoff data collected in the Denver region and, in essence, represents regional “calibration” of the Rational Method. Normally, Equation 6-10 will result in a lesser time of concentration at the first design point and will govern in an urbanized watershed. For subsequent design points, the time of concentration is calculated by accumulating the travel times in downstream drainageway reaches.

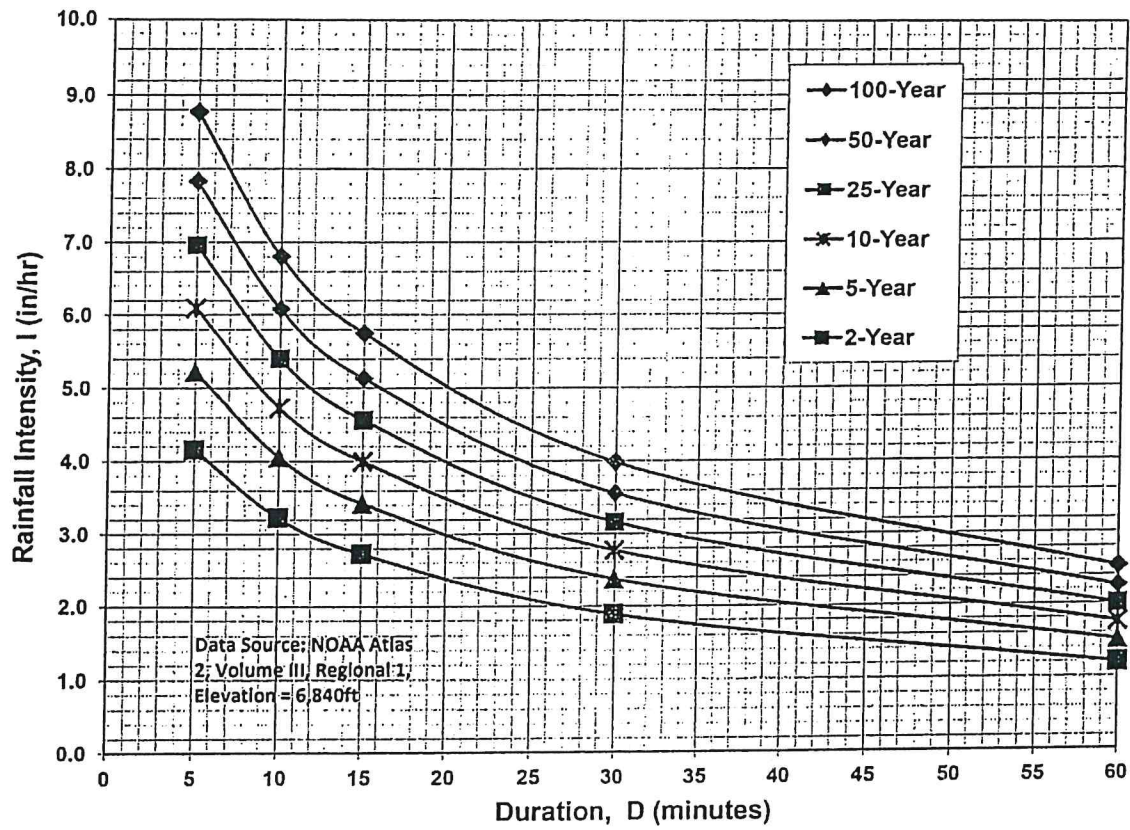
3.2.4 Minimum Time of Concentration

If the calculations result in a t_c of less than 10 minutes for undeveloped conditions, it is recommended that a minimum value of 10 minutes be used. The minimum t_c for urbanized areas is 5 minutes.

3.2.5 Post-Development Time of Concentration

As Equation 6-8 indicates, the time of concentration is a function of the 5-year runoff coefficient for a drainage basin. Typically, higher levels of imperviousness (higher 5-year runoff coefficients) correspond to shorter times of concentration, and lower levels of imperviousness correspond to longer times of

Figure 6-5. Colorado Springs Rainfall Intensity Duration Frequency



IDF Equations

$$I_{100} = -2.52 \ln(D) + 12.735$$

$$I_{50} = -2.25 \ln(D) + 11.375$$

$$I_{25} = -2.00 \ln(D) + 10.111$$

$$I_{10} = -1.75 \ln(D) + 8.847$$

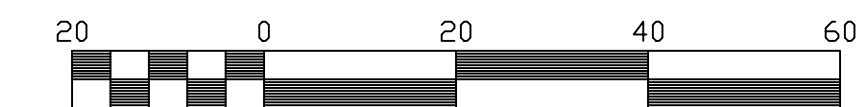
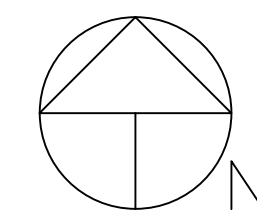
$$I_5 = -1.50 \ln(D) + 7.583$$

$$I_2 = -1.19 \ln(D) + 6.035$$

Note: Values calculated by equations may not precisely duplicate values read from figure.

WOODMEN ROAD R.O.W. VARIES

S 89°10'37" E 224.00'



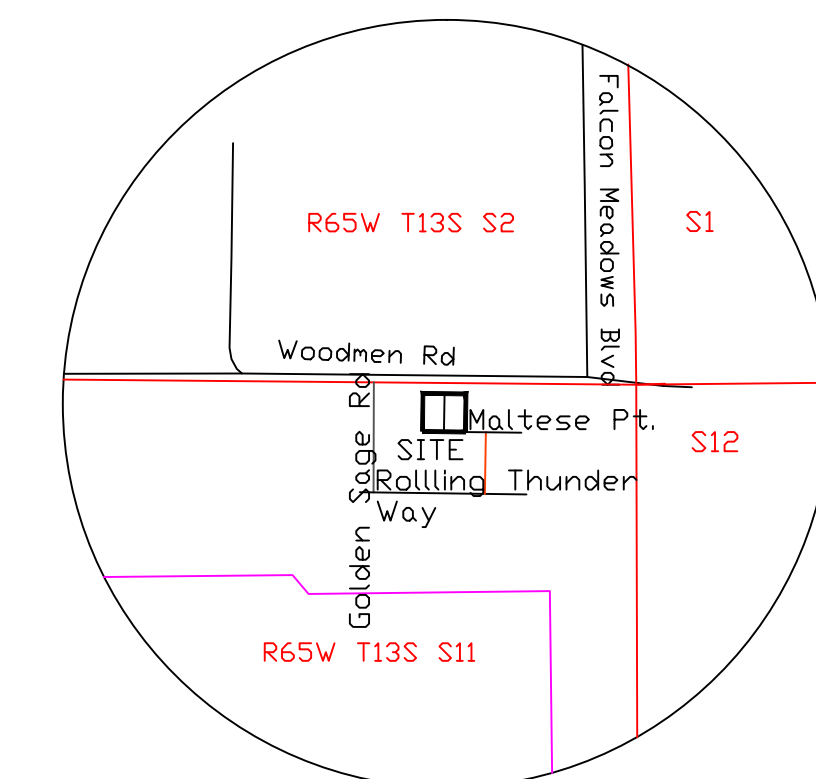
Scale 1" = 20'

Contour Interval: 1'

WGS 84 ORTHOMETRIC HEIGHTS
TBM'S SHOWN ON MANHOLE RIMS

LEGEND:

- × FOUND 60D NAIL (SITE IS NOT MONUMENTED)
- ◇ FOUND #4 REBAR
- ⊙ SEWER MANHOLE
- ⊗ WATER VALVE
- ⊕ FIRE HYDRANT
- ⊞ ELECTRIC VAULT
- SS — PUBLIC UTILITY - PER VISIBLE EVIDENCE



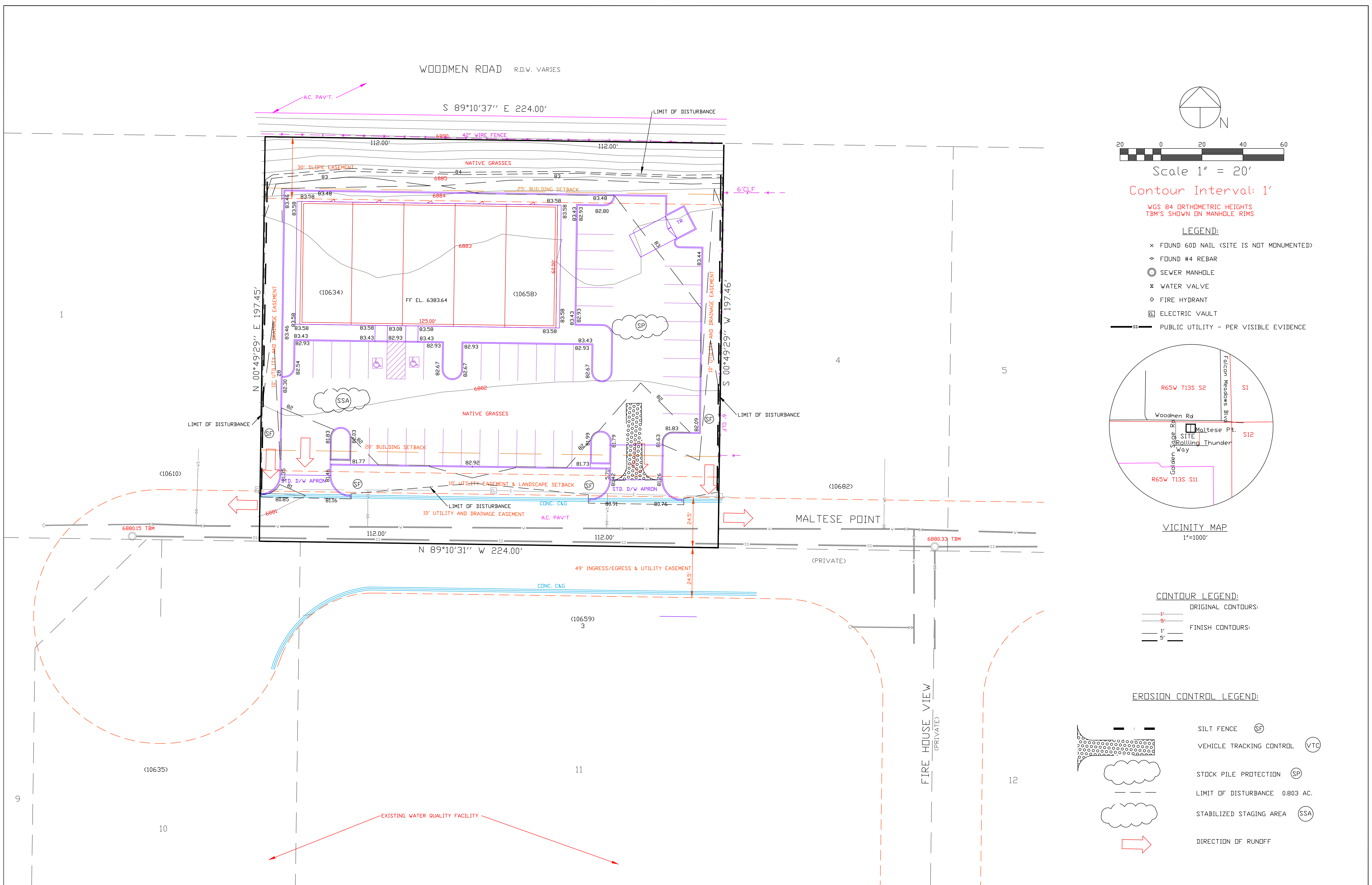
VICINITY MAP
1"=1000'

CONTOUR LEGEND:

- ORIGINAL CONTOURS:
 - 1' (dashed line)
 - 5' (solid line)
- FINISH CONTOURS:
 - 1' (dashed line)
 - 5' (solid line)

EROSION CONTROL LEGEND:

- SILT FENCE (SF)
- VEHICLE TRACKING CONTROL (VTC)
- STOCK PILE PROTECTION (SP)
- LIMIT OF DISTURBANCE 0.803 AC.
- STABILIZED STAGING AREA (SSA)
- DIRECTION OF RUNOFF



DRAWN BY: O.E. WATTS

APPROVED BY:

REVISIONS 7-28-20 REVISED PER COUNTY REVIEW COMMENTS DEW

OLIVER E. WATTS
CONSULTING ENGINEER
COLORADO SPRINGS

PROJECT
10634 & 10658 MALTESE POINT
LOTS 2 & 3, ROLLING THUNDER BUSINESS PARK
EL PASO COUNTY

SHT. NAME
GRADING AND EROSION CONTROL PLAN

SHT. NO.
1
OF
2

DATE: 1-20-20

PROJ. NO.

DWG. NO.: 19-5348-05

DWG.

SURVEYED BY: DEW, ESW, 6-26-19

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.

 Name Date

Owner's Statement:

The Owner will comply with the requirements of the Grading and Erosion Control Plan.

 Name Date

El Paso County:

County plan review is provided only for general conformance with County Design Criteria. The County is not responsible for the accuracy and adequacy of the design, dimensions, and/ or elevations which shall be confirmed at the job site. The County through the approval of this document assumes no responsibility for completeness and/ or accuracy of this document.

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

In accordance with ECM Section 112, 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. Date
 County Engineer / ECM Administrator

Standard Notes for El Paso County Grading and Erosion Control Plans

1. Construction may not commence until a Construction Permit is obtained from Planning and Community Development (PCD) and a preconstruction 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 from 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, the SWMP 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 shall 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. BMPs 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 ditch line.
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 permittee 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 ----- 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

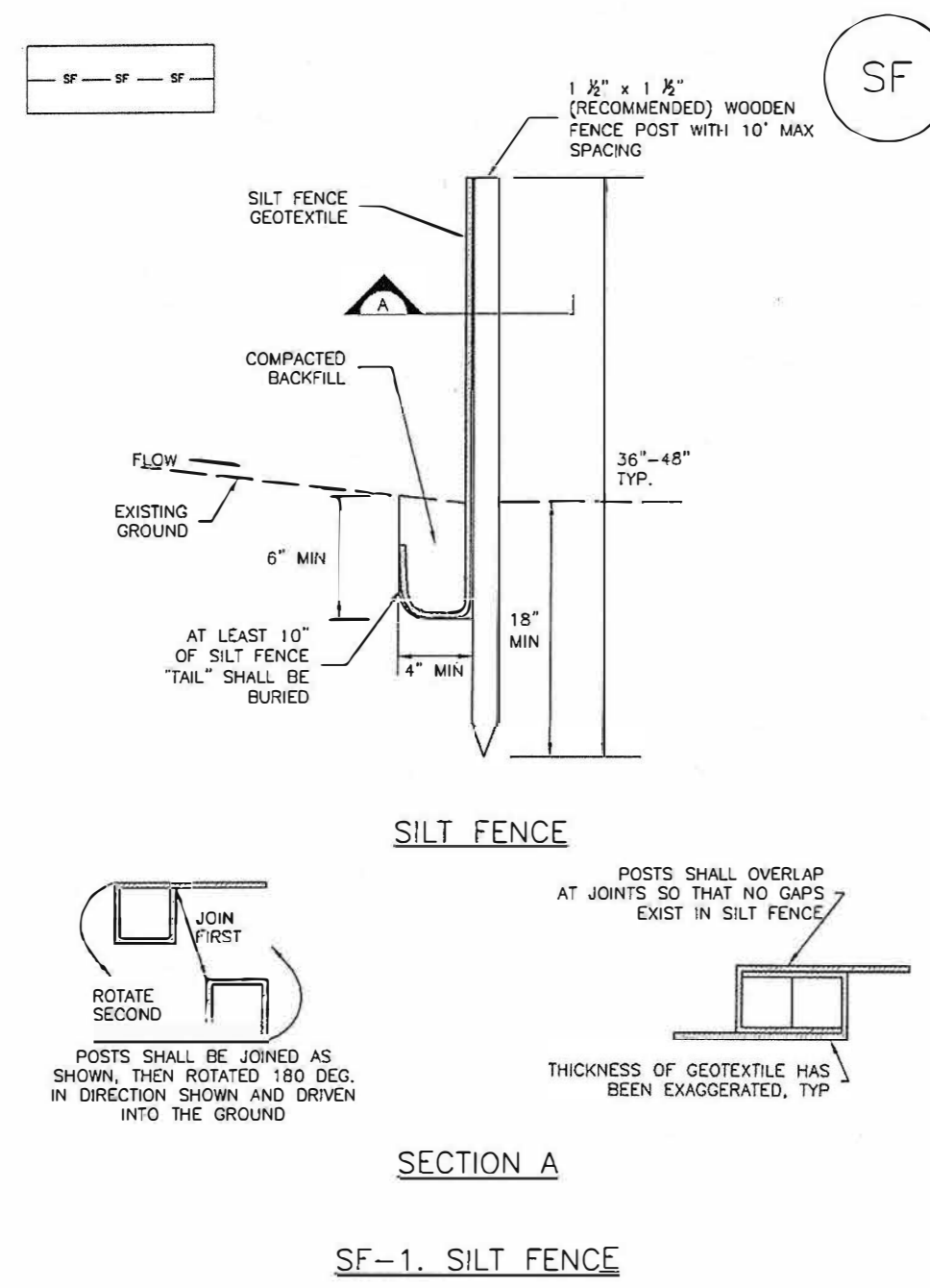
REVEGETATION WILL BE IN ACCORDANCE WITH THE APPROVED LANDSCAPE PLAN.

If the unapproved geological hazard study/waiver ultimately results in significant site changes then a new

| | | | | | | |
|---|-----------------------------------|--|--|---|---|---------------------------|
| DRAWN BY: O.E. WATTS DATE: 1-20-20 DWG. NO.: 19-5348-06 SURVEYED BY: DEW, ESW, 6-26-19 | APPROVED BY: PROJ. NO. DWG. | REVISIONS 7-28-20 REVISED PER COUNTY REVIEW COMMENTS DEW | OLIVER E. WATTS CONSULTING ENGINEER COLORADO SPRINGS | PROJECT 10634 & 10658 MALTESE POINT LOTS 2 & 3, ROLLING THUNDER BUSINESS PARK EL PASO COUNTY | SHEET NAME EROSION CONTROL PLAN | SHEET NO. 2 OF 2 |
|---|-----------------------------------|--|--|---|---|---------------------------|

Silt Fence (SF)

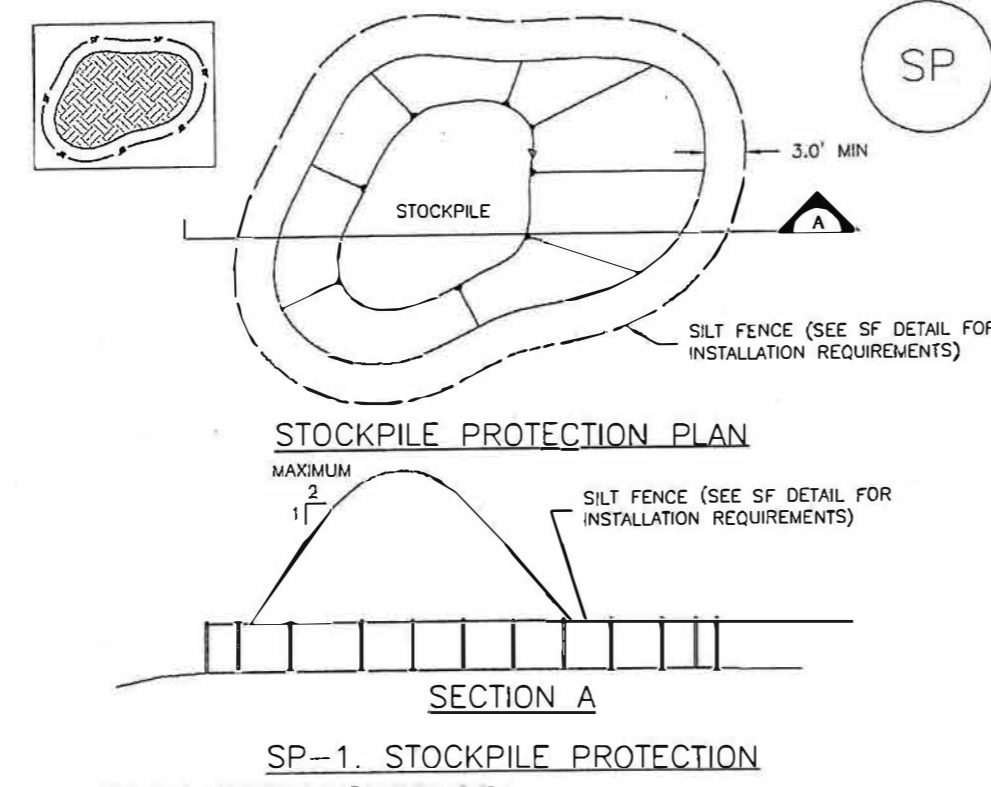
SC-1



November 2010 Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual Volume 3 SF-3

Stockpile Management (SP)

MM-2



SP-1. STOCKPILE PROTECTION

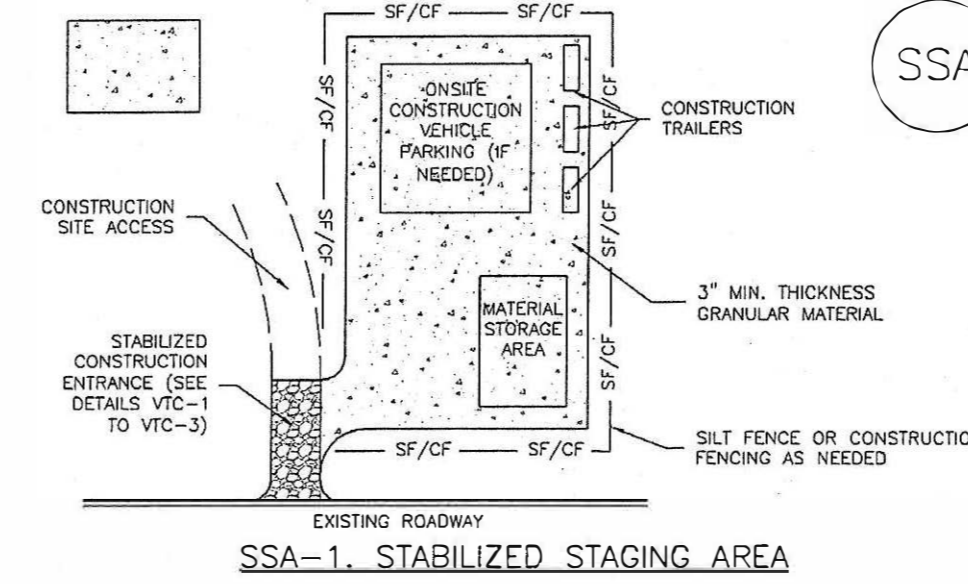
STOCKPILE PROTECTION INSTALLATION NOTES

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

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Stabilized Staging Area (SSA)

SM-6



SSA-1. STABILIZED STAGING AREA

STABILIZED STAGING AREA INSTALLATION NOTES

- SEE PLAN VIEW FOR:
 - LOCATION OF STAGING AREA(S)
 - CONTRACTOR MAY ADJUST LOCATION AND SIZE OF STAGING AREA WITH APPROVAL FROM THE LOCAL JURISDICTION.
- STABILIZED STAGING AREA SHOULD BE APPROPRIATE FOR THE NEEDS OF THE SITE. OVERSIZING RESULTS IN A LARGER AREA TO STABILIZE FOLLOWING CONSTRUCTION.
- STAGING AREA SHALL BE STABILIZED PRIOR TO OTHER OPERATIONS ON THE SITE.
- THE STABILIZED STAGING AREA SHALL CONSIST OF A MINIMUM 3" THICK GRANULAR MATERIAL.
- UNLESS OTHERWISE SPECIFIED BY LOCAL JURISDICTION, ROCK SHALL CONSIST OF DOT SECT. #703, ASHTO #3 COARSE AGGREGATE OR 8" (MINUS) ROCK.
- ADDITIONAL PERIMETER BMPs MAY BE REQUIRED INCLUDING BUT NOT LIMITED TO SILT FENCE AND CONSTRUCTION FENCING.

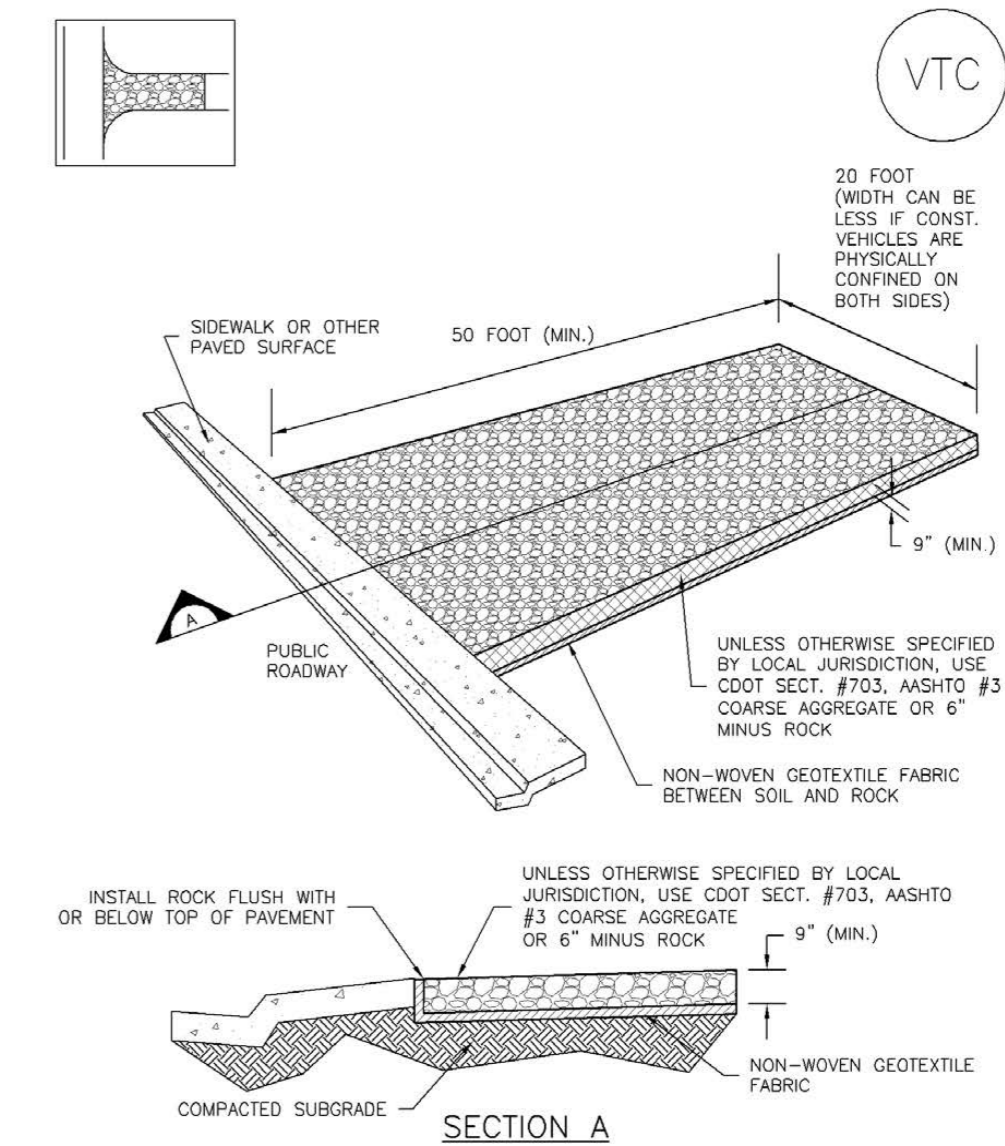
STABILIZED STAGING AREA MAINTENANCE NOTES

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

November 2010 Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual Volume 3 SSA-3

Vehicle Tracking Control (VTC)

SM-4



VTC-1. AGGREGATE VEHICLE TRACKING CONTROL

November 2010 Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual Volume 3 VTC-3

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 PONDING. SILT FENCE AT THE TOE OF A SLOPE SHOULD BE INSTALLED IN A FLAT LOCATION AT LEAST SEVERAL FEET (2-3 FT) FROM THE TOE OF THE SLOPE TO ALLOW ROOM FOR PONDING AND DEPOSITION.
- A UNIFORM 6" X 4" ANCHOR TRENCH SHALL BE EXCAVATED USING TRENCHER OR SILT FENCE INSTALLATION DEVICE, NO ROAD GRADERS, BACKHOES, OR SIMILAR EQUIPMENT SHALL BE USED.
- COMPACT ANCHOR TRENCH BY HAND WITH A "JUMPING JACK" OR BY WHEEL ROLLING. COMPACTION SHALL BE SUCH THAT SILT FENCE RESISTS 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 SHO 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 "U-HOOK." THE "U-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 PRIOR TO ANY LAND DISTURBING ACTIVITIES.

SILT FENCE MAINTENANCE NOTES

- INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.
- FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
- WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.
- SEDIMENT ACCUMULATED UPSTREAM OF THE 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 PARKER, COLORADO AND CITY OF AURORA, NOT AVAILABLE IN AUTOCAD)

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

SF-4 Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual Volume 3 November 2010

MM-2

Stockpile Management (SM)

STOCKPILE PROTECTION MAINTENANCE NOTES

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

STOCKPILE PROTECTION INSTALLATION NOTES

- IF PERIMETER PROTECTION MUST BE MOVED TO ACCESS SOIL STOCKPILE, REPLACE PERIMETER CONTROLS BY THE END OF THE WORKDAY.
- STOCKPILE PERIMETER CONTROLS CAN BE REMOVED ONCE ALL THE MATERIAL FROM THE STOCKPILE HAS BEEN USED.

(DETAILS ADAPTED FROM PARKER, COLORADO, NOT AVAILABLE IN AUTOCAD)

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

SP-4 Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual Volume 3 November 2010

SM-6

Stabilized Staging Area (SSA)

STABILIZED STAGING AREA MAINTENANCE NOTES

- STABILIZED STAGING AREA SHALL BE ENLARGED IF NECESSARY TO CONTAIN PARKING, STORAGE, AND UNLOADING/LOADING OPERATIONS.
- THE STABILIZED STAGING AREA SHALL BE REMOVED AT THE END OF CONSTRUCTION. THE GRANULAR MATERIAL SHALL BE REMOVED OR, IF APPROVED BY THE LOCAL JURISDICTION, USED ON SITE, AND THE AREA COVERED WITH TOPSOIL, SEEDING AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY LOCAL JURISDICTION.

NOTE: MANY MUNICIPALITIES PROHIBIT THE USE OF RECYCLED CONCRETE AS GRANULAR MATERIAL FOR STABILIZED STAGING AREAS DUE TO DIFFICULTIES WITH RE-ESTABLISHMENT OF VEGETATION IN AREAS WHERE RECYCLED CONCRETE WAS PLACED.

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

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

SSA-4 Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual Volume 3 November 2010

SM-4

Vehicle Tracking Control (VTC)

STABILIZED CONSTRUCTION ENTRANCE/EXIT INSTALLATION NOTES

- SEE PLAN VIEW FOR:
 - LOCATION OF CONSTRUCTION ENTRANCE(S)/EXIT(S)
 - TYPE OF CONSTRUCTION ENTRANCE(S)/EXIT(S) (WITH/WITHOUT WHEEL WASH, CONSTRUCTION MAT OR TRM)
- CONSTRUCTION MAT OR TRM STABILIZED CONSTRUCTION ENTRANCES ARE ONLY TO BE USED ON SHORT DURATION PROJECTS (TYPICALLY RANGING FROM A WEEK TO A MONTH) WHERE THERE WILL BE LIMITED VEHICULAR ACCESS.
- A STABILIZED CONSTRUCTION ENTRANCE/EXIT SHALL BE LOCATED AT ALL ACCESS POINTS WHERE VEHICLES ACCESS THE CONSTRUCTION SITE FROM PAVED RIGHT-OF-WAYS.
- STABILIZED CONSTRUCTION ENTRANCE/EXIT SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.
- A NON-WOVEN GEOTEXTILE FABRIC SHALL BE PLACED UNDER THE STABILIZED CONSTRUCTION ENTRANCE/EXIT PRIOR TO THE PLACEMENT OF ROCK.
- UNLESS OTHERWISE SPECIFIED BY LOCAL JURISDICTION, ROCK SHALL CONSIST OF DOT SECT. #703, ASHTO #3 COARSE AGGREGATE OR 8" (MINUS) ROCK.

STABILIZED CONSTRUCTION ENTRANCE/EXIT MAINTENANCE NOTES

- INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.
- FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
- WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.
- ROCK SHALL BE REAPPLIED OR REGRADED AS NECESSARY TO THE STABILIZED ENTRANCE/EXIT TO MAINTAIN A CONSISTENT DEPTH.
- SEDIMENT TRACKED ONTO PAVED ROADS IS TO BE REMOVED THROUGHOUT THE DAY AND AT THE END OF THE DAY BY SHOVELING OR SWEEPING. SEDIMENT MAY NOT BE WASHED DOWN STORM SEWER DRAINS.

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

(DETAILS ADAPTED FROM CITY OF BROOMFIELD, COLORADO, NOT AVAILABLE IN AUTOCAD)

VTC-6 Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual Volume 3 November 2010

Prepared by the Office of:
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oliewatts@aol.com
Celebrating over 39 years in business

| | | | | | | |
|---|-----------------------------------|-----------|--|---------|---|----------------|
| DRAWN BY: O.E. WATTS DATE: 12-14-18 DWG. NO.: 19-5348 | APPROVED BY: PROJ. NO. DWG. | REVISIONS | OLIVER E. WATTS CONSULTING ENGINEER COLORADO SPRINGS | PROJECT | SHT. NAME EROSION CONTROL DETAILS | SHT. NO. OF |
|---|-----------------------------------|-----------|--|---------|---|----------------|