STORMWATER MANAGEMENT PLAN
LOT 2, BENT GRASS EAST COMMERCIAL FILING NO. 4
CARUBIA PROPERTIES

PREPARED FOR:

CARUBIA PROPERTIES
8035 MERIDIAN PARK DRIVE
FALCON, CO 80831
719-640-1962
CONTACT: LUCAS CARUBIA

PREPARED BY:

PERCEPTION DESIGN GROUP, INC.
6901 SOUTH PIERCE STREET, SUITE 315
LITTLETON, CO 80128
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(303) 232-8088

JOB #2024-019

FEBRUARY 4, 2025

STORMWATER MANAGEMENT PLAN
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Engineer of Record

The Stormwater Management 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 and State for Stormwater Management Plans.

_____ _____

Engineer of Record Signature Date

Review Engineer:

The Stormwater Management Plan was reviewed and found to meet the checklist requirements except where otherwise noted or allowed by an approved deviation request.

_____ _____

Review Engineer Date

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Contents

QUALIFIED STORMWATER MANAGER AND IMPORTANT CONTACTS

Owner/Operator(s):
Carubia Properties
8035 Meridian Park Drive
Falcon, CO 80831
Contact: Lucas Carubia
(719) 640-1962

Project Manager(s) or Site Supervisor(s):
To be Determined
Name:
Address:
Phone:
24-hour phone:
Email:
Area of Control (if more than 1 operator at site): General Contractor

Qualified Stormwater Manager Contact(s):
To be Determined
Name:
Address:
Phone:
24-hour phone:
Email:
Area of Control (if more than 1 operator at site): General Contractor

Emergency 24-Hour Contact (for site, not 911):
To be Determined
Name:
Address:
Phone:
24-hour phone:
Email:
Area of Control (if more than 1 operator at site): General Contractor

I.C.1 SITE DESCRIPTION

This Stormwater Management Plan is prepared by Perception Design Group, Inc. as part of the Site Development Plan submittal process for the Carubia Properties project is located on the east side of Meridian Park Drive approximately 300 feet south of Bent Grass Meadows Drive in Falcon, Colorado. The site address is 8035 Meridian Park Drive, Falcon, CO 80831. It is in unincorporated El Paso County. Meridian Park Drive is located to the west of the property and Meridian Road is to the east. See appendix for vicinity map.

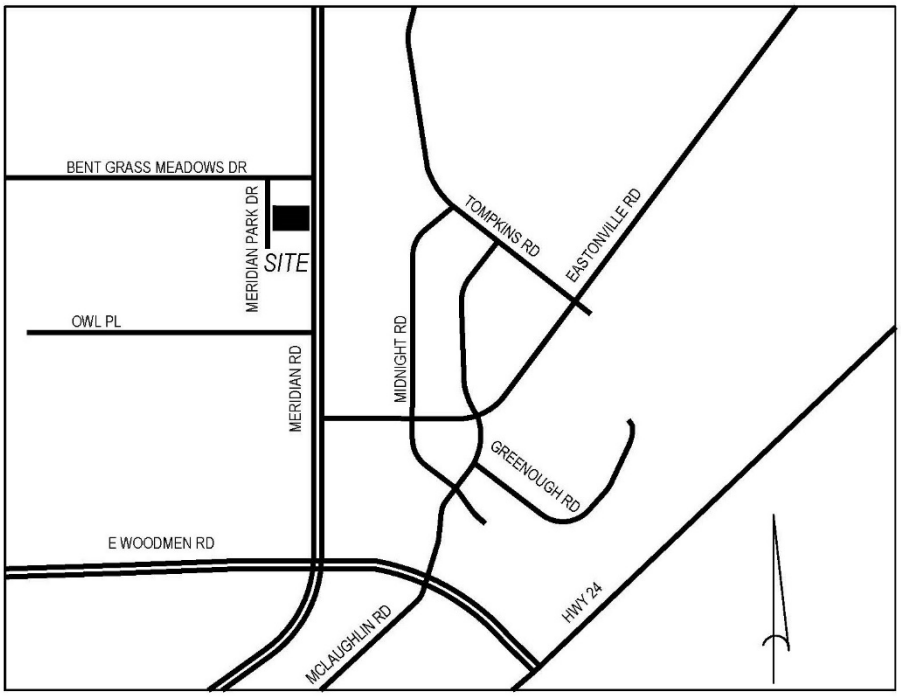

Figure 1: Vicinity Map

Surrounding developments include Lot 1 Bent Grass East Commercial Filing No.1 to the north. This site is developed as a 7-Eleven fuel station and convenience store. To the west Is Bent Grass East Commercial Filing No 2B and Filing No. 3 which are vacant ground and a veterinary clinic. To the south is vacant ground in Bent Grass East Commercial Filing No 4. To the east is Woodmen Hills Fil No 8, a residential subdivision.

The Site is 0.87 acres. By rectangular survey coordinates the project is located in the Northeast Quarter of Section 1, Township 13 South, Range 65 West of the 6th P.M. County Of El Paso, State of Colorado.

The site is presently undeveloped. As a part of this application, the site will be developed with a commercial medical building and associated parking lots.

The existing ground cover consists of bare dirt and native grass. 50% of the site is native grasses determined by aerial inspection using Google Earth. Site topography slopes from north to south at average 3%. The easterly side of the site discharges to the roadside ditch of Meridian Road while the westerly side of the site discharges onto the adjacent property south into the existing detention pond. Site soils as illustrated on the NRCS Web Soil Survey indicate Columbine gravelly sandy loam soils are present at the site. This soil is a well-drained soil with hydrologic soil group A designation. There are no major drainageways on the property. The Site falls within the Middle Tributary Basin within the Falcon Drainage Basin. The receiving waters is the Falcon Drainage Basin. The site is not within a streamside zone. There are no irrigation facilities on the property. Encumbrances on the site include various utilities in easements generally around the perimeter of the site. Estimated total area of disturbance including off site utility tie ins is 0.87 ac +/-.

The GEC Plan sheets show the proposed grading and erosion control activities. The proposed sequence of activities is as follows:

1. Install perimeter construction fence, silt fence, stabilized staging area, vehicle tracking control, and sediment basin.

2. Over-excavate the building pad.

3. Grade the site.

4. Begin construction of buildings and utilities and install utility BMPs.

5. Grade for and install curb and gutter.

6. Pave and landscape. After paving is complete, remove vehicle tracking control.

8. Complete building construction.

9. After final stabilization, remove sediment control logs and inlet protection, and clean sediment from paved surfaces and storm sewers.

Timing & Schedule

General construction sequencing and activities associated with this project consist of the following:

INITIAL AND INTERIM PHASE

The initial phase shall consist of the temporary construction BMPs to minimize potential for erosion and sediment transfer while mobilizing and preparing the Site for construction activities. The anticipated initial phase sequencing as follows:

1. Prepare and submit the Building Permit for work associated with Site grading, GESC, Building and improvements.
2. Install *Vehicle Tracking Control (VTC)* as shown on the GESC Plan. The location may vary based on Site construction activities. Contractor shall update the GESC Plan to show field location of the VTC.
3. Prepare *Stabilized Staging Area (SSA).* Contractor to note the actual size and location of this area and shall minimize this area. Perimeter controls shall be installed with the SSA
4. Install and denote on the GESC Plan any of the following areas: trailer, parking, lay down, porta-potty, wheel wash, concrete washout, mason's area, fuel and material storage containers, solid waste containers, etc.
5. Install perimeter controls including *Silt Fence (SF)* and *Construction Fence (CF)* around limits as shown on GESC Plan. Ensure that the *Limits of Construction (LOC)* are defined as necessary or known by all parties which will be responsible for construction on the Site. Limits of Construction is intended to denote the areas of construction, and mitigate disturbance beyond the LOC.
6. Install other BMPS as shown on the GESC Plan.
7. Upon completion of the initial BMP installation the Qualified Stormwater Manager shall schedule a Pre-Construction Meeting with the local permitting agency to confirm BMPs installed are adequate prior to proceeding with additional land disturbing activities.
8. Begin clearing and grubbing of the Site.

9. Begin grading the Site. Stockpile materials in accordance with the *Soil Stockpile Management (SP)* BMP. The location may vary based on the contractor's discretion and Site phasing. Perimeter controls shall be provided in all circumstances.
10. Install *Concrete Washout Area (CWA)* prior to construction of concrete improvements. A portable container may be utilized. Note the CWA location on the approved GESC Plan.
11. Start construction of building.
12. Install the utilities.
13. Install pavement, curb and gutters.
14. Install the Interim *Sediment Control Logs (SCL)* and *Silt Fences (SF)* as shown on the GESC plan.
15. After completion of Site development, and major construction of the building is completed, Fine grading of the Site is completed.

FINAL STABILIZATION

Site stabilization will occur with permanent landscaping around the detention facility and permanent seeding in all dirt areas. Refer to the landscaping plans and drainage plans for additional information and design. If final landscaping cannot be installed at the time of final GESC, temporary BMPs, SM, ECB, SCL etc., shall be installed and maintained, until such time that final landscaping can be installed.

Total time of exposure from initial grading to final stabilization is estimated at 12 months. Construction of the identified improvements will occur with one phase. BMPs shall be installed in accordance with the permit and the GESC Plans.

Of the approximate 0.87 acres onsite and offsite areas respectively, 0.87 acres will undergo grading and disturbance. This includes an area off-site to the west side of the site where the water, fire and sanitation service lines will be installed to the main.

During construction, vehicles may be fueled on-site. No on-site fuel tanks are proposed, with fueling occurring from a fuel truck. Care should be taken during fueling procedures. Drip pans shall be used to contain any leaking fluids. Should leaks be discovered, repairs shall be made to stop the leaks. Spill kits shall be available on-site. Should any spillage occur, the contaminated soil shall be immediately excavated and removed from the site to a disposal area licensed to handle the contaminated material. Appropriate governmental agencies shall also

be notified immediately. Concrete trucks will also wash out on site. A concrete washout pit shall be provided on site to prevent contaminated wash water from leaving the site. The concrete washout may be a temporary or portable facility. Upon completion of the concrete work, the pit shall be excavated, and materials disposed of at a disposal area licensed to handle the contaminated material. Paints, solvents, and other construction related contaminants may also be stored on site. Care should be taken to keep such materials in their original containers and storage should be indoors or inside an appropriate storage trailer.

Potential non-stormwater discharges include waterline flushing, irrigation return flow, and concrete washout.

All construction site personnel shall control waste such as discarded materials, hazardous chemicals (to include but not be limited to, heavy equipment maintenance fluids, motor oil, antifreeze and secondary containment of vehicle fuel), litter, and sanitary waste at the construction site that may cause adverse impacts to water quality. Chemicals, paints, solvents, fertilizers, and other toxic materials must be stored in weatherproof containers. Except during application, the contents must be kept in trucks or within storage facilities. Runoff containing such material must be collected, removed from the Site, treated, and disposed at an approved solid waste or chemical disposal facility.

During Construction, Contractor will redline GEC plans updating any SWMP control measures that need to be changed at the discretion of the Qualified Stormwater Manager.

I.C.2 SWMP MAP

The SWMP map for this project includes the following plans prepared by Perception Design Group, Inc. and included as an attachment to this report.

Sheet C5.10 and C5.12	GEC Plans
Sheet C5.90 thru C5.92	GEC Details

I.C.3 STORMWATER MANAGEMENT CONTROLS

Structural Erosion and Sediment Controls

- Vehicle tracking control will be used to limit soils tracking from the site.
- A staging area will be established with anchored portable toilets and solid waste collection dumpsters with lids. The staging area will be protected with rock socks.
- Inlet protection to be placed on the outlet structure.
- A sediment basin is to be graded.
- Silt fence is to be placed as illustrated on the plan.
- Prior to concrete placement, a concrete washout area will be established.
- Sediment control logs will be placed around the interface of pavement, curb, and sidewalks and disturbed soils.

Non-Structural Erosion and Sediment Controls

- Street sweeping shall be employed.
- Temporary seeding and mulching for interim erosion control.
- Site watering during grading for dust control.
- Permanent seeding and mulching to occur in areas that permanent landscaping is delayed in.

Materials Handling and Spill Prevention

The following are the material management practices that will be used to reduce the risk of spills or other accidental exposure of materials and substances to stormwater runoff.

General:

1. An effort will be made to store only enough product required to do the job.

2. All materials stored on-site will be stored in a neat, orderly manner in their appropriate containers and, if possible, under a roof, tarp, or other enclosure.

3. Products will be kept in their original containers with the original manufacturer’s label.

4. Substances will not be mixed with one another unless recommended by the manufacturer.

5. Whenever possible, all of a product will be used up before disposing of the container.

6. Manufacturer's recommendations for proper use and disposal will be followed.

7. The site superintendent will inspect daily to ensure proper use and disposal of materials on-site.

8. The site superintendent will conduct regular meetings and training with subcontractors to educate them on proper handling and spill prevention techniques as well as education on the procedures should a spill occur.

Hazardous Products:

1. Products will be kept in original containers unless they are not re-sealable.

2. Original labels and material safety data will be retained.

3. If surplus product must be disposed of manufacturer's recommendations of local and state methods for proper disposal will be followed.

Product Specific Practices

1. Petroleum Products - All on-site vehicles will be monitored for leaks and receive regular preventative maintenance to reduce the chance of leakage. Should leaks be observed, drip pans shall be used until repairs can be made. Petroleum products will be stored in tightly sealed containers which are clearly labeled. Any Asphalt substances used on-site will be applied according to the manufacturer's recommendations. Vehicle fueling will occur on paved level surfaces. Absorbent will be kept on hand for immediate use should a spill occur. No above ground fuel tanks are proposed.

2. Fertilizers - Fertilizers used will be applied only in the minimum amounts recommended by the manufacturer. Once applied, fertilizer will be worked into the soil to limit exposure to storm water. Storage will be in a covered shed. The contents of any partially used bags of fertilizer will be transferred to a sealable plastic bin to avoid spills.

3. Paints - All containers will be tightly sealed and stored when not required

for use. Excess paint will not be discharged to the storm sewer system but will be properly disposed of according to manufacturer's instructions and state and local regulations.

In addition to the material management practices discussed above, the following practices will be followed for spill prevention and cleanup.

SPILL RESPONSE -Cleanup and Removal Procedures

NOTE: IN CASE OF FIRE, EVACUATE ALL PERSONNEL FROM THE IMMEDIATE AREA, RENDER FIRST AID TO ANYONE WHO IS INJURED, AND DIAL 911 IMMEDIATELY. TAKE APPROPRIATE STEPS TO PROTECT HUMAN LIFE AND TO CONTROL FIRES FIRST. SPILL CONTROL IS SECONDARY.

Upon detection of any spill, the first action to be taken is to ensure personal safety. All possible ignition sources, including running engines, electrical equipment (including cellular telephones, etc.), or other hazards will be immediately turned off or removed from the area. The extent of the spill and the nature of the spilled material will be evaluated to determine if remedial actions could result in any health hazards, escalation of the spill, or further damage that would intensify the problem. If such conditions exist, a designated employee will oversee the area of the spill and the construction Qualified Stormwater Manager will be notified immediately.

· The source of the spill will be identified and if possible, the flow of pollutants stopped if it can be done safely. However, no one should attend to the source or begin cleanup of the spill until **ALL** emergency priorities (fire, injuries, etc.) have been addressed.

Small Spills

Small spills (usually <5 gallons) consist of minor quantities of gasoline, oil, anti-freeze, or other materials that can be cleaned up by a single employee using readily available materials.

The following procedures should be used for clean-up of small spills:

a. Ensure personal safety, evaluate the spill, and if possible, stop the flow of pollutants.

b. Contain the spread of the spill using absorbents, portable berms, sandbags, or other available measures.

c. Spread absorbent materials on the area to soak up as much of the liquid as possible and to prevent infiltration into the soil.
d. Once the liquids have been absorbed, remove all absorbents from the spill and place the materials in a suitable storage container. On paved areas, wipe any remaining liquids from the surface and place the materials in a storage container. Do not spray or wash down the area using water. For open soil areas, excavate any contaminated soil as soon as possible and place the soil in a suitable storage container. All materials will then be transported off-site for disposal.
e. If immediate transfer and storage of the contaminated soil is not practical, excavate and place the contaminated soil on a double thickness sheet of 3-mil or higher polyethylene film and cover the contaminated material with 3-mil or higher polyethylene film. In addition, a small berm should be formed around the outer edges of the soil stockpile, underneath the polyethylene film, to ensure that contaminants are not washed from the site during precipitation events and that materials do not seep through the berm.
f. Record all significant facts and information about the spill, including the following:
· Type of pollutant
· Location
· Apparent source
· Estimated volume
· Time of discovery
· Actions taken to clean up spill
g. Notify the Qualified Stormwater Manager of the spill and provide the information from Item f. The Qualified Stormwater Manager will then contact the City of Colorado Springs.

Medium to Large Spills
Medium to large spills consist of larger quantities of materials (usually >5 – 25 gallons) that are used on site that cannot be controlled by a single employee. Generally, a number of facility personnel will be needed to control the spill and a response may require the suspension of other facility activities.

The following procedure shall be used for the cleanup of medium to large spills:
a. Ensure personal safety, evaluate the spill, and if possible, stop the flow of pollutants.
b. Immediately dispatch a front-end loader or similar equipment to the spill and construct a berm or berms down gradient of the spill to minimize the spread of potential pollutants. On paved surfaces, portable berms, sandbags, booms, or other measures will be used to control the lateral spread of the pollutants.

c. When the spread of the spill has been laterally contained, contact the Qualified Stormwater Manager or designated facility employee and provide them information on the location, type, and amount of spilled material, and a briefing on the extent of the spread and measures undertaken to contain the contaminants.
d. Depending on the nature of the spill, mobilize additional resources as needed to contain the contaminants.
e. Cleanup will commence when the lateral spread has been contained and the notification to the Qualified Stormwater Manager has been made.
f. Freestanding liquid will be bailed or pumped into 55-gallon storage drums, steel tanks, or other suitable storage containers. When all the liquid has been removed from the pavement or soil layer, absorbents will be applied to the surface and transferred to the storage containers when they have soaked up as much of the spill as possible.
g. On paved surfaces, the remaining contaminants will be removed to the extent possible, with rags, sweeping, or similar measures. The area of the spill will not be sprayed or washed down using water. Any contaminant-soaked materials will be placed into storage containers with the other absorbents.
h. The remaining contaminated soil will be excavated and loaded into a dump truck(s) for disposal off-site at a designated facility. If transport off-site is not immediately available, the remaining soils will be stockpiled on a double thickness sheet of 3-mil or higher polyethylene film and also covered with 3-mil or higher polyethylene film. In addition, a small berm will be formed around the outer edges of the soil stockpile, underneath the polyethylene film, to ensure that contaminants are not washed from the site during precipitation and do not seep through the berm.
i. Record all significant facts and information about the spill, including the following:
· Type of pollutant
· Location
· Apparent source
· Estimated volume
· Time of discovery
· Actions taken to clean up spill
j. Provide the Qualified Stormwater Manager (or designated employee) with the information from Item i. The Qualified Stormwater Manager will then contact the County of El Paso.

NOTIFICATION
Notification to the Colorado Department of Public Health & Environment (CDPHE) and the County of El Paso is required if there is any release or

suspected release of any substance, including oil or other substances that spill into or threaten State waters. Unless otherwise noted, notifications are to be made by the Qualified Stormwater Manager and only after emergency responses related to the release have been implemented. This will prevent misinformation and assures that notifications are properly conducted.

The notification requirements are as follows:

1. **Spills into/or Threatens State Waters**: Immediate notification is required for releases that occur beneath the surface of the land or impact or threaten waters of the State or threaten the public health and welfare.

Notifications that will be made are:
a. For any substance, regardless of quantity, contact CDPHE at 1-877-518-5608. State as follows:
a) Give your name.
b) Give location of spill (name of city).
c) Describe the nature of the spill, type of products, and estimate size of spill.
d) Describe type of action taken thus far, type of assistance or equipment needed.
b. For any quantity of oil or other fluids, call the National Response Center at 1-800-424-8802. State as follows:
a) Give your name.
b) Give location of spill (name of city and state).
c) Describe the nature of the spill, type of product, and estimate size of spill.
d) Describe type of action taken thus far, type of assistance or equipment needed.
e) Call County of El Paso

2. **Reportable Quantity Spill on Land Surface**: Immediate notification is required of a release upon the land surface of an oil in quantity that exceeds 25 gallons, or of a hazardous substance that equals or exceeds 10 pounds or its reportable quantity under Section 101(14) of the Comprehensive Environmental Response, Compensation Liability Act (CERCLA) of 1980 as amended (40 CFR Part 302) and Section 329 (3) of the Emergency Planning and Community Right to Know Act of 1986 (40 CFR Part 355) whichever is less. This requirement does apply at a minimum to the substances listed in Table A below.

TABLE A
Substances Requiring Notification
SUBSTANCE REPORTABLE QUANTITY

Motor Oil 25 Gallons
Hydraulic Oil 25 Gallons
Gasoline/Diesel Fuel 25 Gallons

The notification procedures to be followed are:
a) Give your name.
b) Give location of spill (name of city and state).
c) Describe nature of the spill, type of product, and estimate size of spill.
d) Describe type of action taken thus far, type of assistance or equipment needed.
3. Notification is not required for release of oil upon the land surface of 25 gallons or less that will not constitute a threat to public health and welfare, the environment or a threat of entering the waters of the State.
4. Notification, as required in paragraphs 1 and 2 above, will be made to the CDPHE using the 24-hour telephone number to report environmental spills. All information known about the release at the time of discovery is to be included, such as the time of occurrence, quantity and type of material, location and any corrective or clean-up actions presently being taken. Table B lists these phone numbers.

SPILL RESPONSE CONTACTS

TABLE B
Emergency Notification Contacts
Name/Agency Number
El Paso Fire and Rescue 911
County of El Paso Department 911
Ambulance 911
Hospital 911
National Response Center 1-800-424-8802
CDPHE – Report Environmental Spills (24 hrs/day) 1-877-518-5608
County of El Paso – Police Department Dispatch
Also contact Qualified Stormwater Manager and Owner

It is the responsibility of the Qualified Stormwater Manager to contact the County of El Paso, CDPHE, and/or the National Response Center.

The National Response Center is to be contacted when a release containing a hazardous substance or oil in an amount equal to or in excess of a reportable

quantity established under either 40 CFR 110, 4- DFR 117, or 40 CFR 302 occurs during a 24-hour period.

Notification to the **CDPHE** and **County of El Paso** is required if there is any release or suspected release of any material, including oil or hazardous substances that spill into or threaten state waters.

REPORTS

The CDPHE and County of El Paso require written notification of a spill or discharge of oil or other substance that may cause pollution of the waters of the State of Colorado. A written report must be submitted to the Water Quality Control District (WQCD) and the County of El Paso Environmental Services Section within five days after becoming aware of the spill or discharge. The CDPHE and County of El Paso require a written final report within 15 days for all releases of an oil or hazardous substance that require implementation of a contingency plan. The CDPHE and County of El Paso may also require additional reports on the status of the clean up until any required remedial action has been complete.

Written notification of reports must contain at a minimum:
1. Date, time, and duration of the release.
2. Location of the release.
3. Person or persons causing and responsible for the release.
4. Type and amount of oil or substance released.
5. Cause of the release.
6. Environmental damage caused by the release.
7. Actions taken to respond, contain, and clean up the release.
8. Location and method of ultimate disposal of the oil or other fluids.
9. Actions taken to prevent a reoccurrence of the release.
10. Any known or anticipated acute or chronic health risks associated with the release.
11. When appropriate advice regarding medical attention necessary for exposed individuals.

Identification of Potential Pollutant Sources

1. Disturbed and stored soils. Disturbed soils will be contained with perimeter SCL, silt fence, and inlet protection.
2. Vehicle tracking of sediment. A VTC will be installed to limit vehicle tracking.
3. Management of contaminated soils. No contaminated soils have been identified on site. If contamination occurs during construction, follow spill prevention and management discussion above.
4. Loading and unloading operations. Loading operations shall occur in the staging area

with protection provided by rock socks.
5. Outdoor storage. Outdoor storage to occur in staging area with rock sock protection.
6. Vehicle and equipment maintenance. These operations to occur in the staging area with rock sock protection and drip pans.
7. Dust and particulate generation. A water truck should be available on windy days to limit dust.
8. Routine maintenance involving fertilizers, pesticides, detergents, fuels, solvents and oils. Fertilizers and pesticides will only be applied at rates specified by the manufacturer. Other spills shall be handled in accordance with the spill prevention and material handling section above.
9. On-site waste management. Trash and debris shall be collected and secured in covered dumpsters at the end of each work day.
10. Concrete washout. Concrete trucks shall washout in the designated concrete washout area provided on site.
11. Asphalt and concrete batch plants will not be used on this project.
12. Non industrial trash. Worker trash shall be collected in enclosed dumpsters at the end of each day. Portable toilets shall be placed and anchored in the staging area and emptied regularly.
13. Groundwater and construction dewatering are not anticipated on site. However, should groundwater be encountered and dewatering be required, appropriate BMP's shall be installed as required by the County of El Paso prior to pumping.
14. No other areas of potential spills are known.

I.C.4 FINAL STABILIZATION AND LONG-TERM STORMWATER MANAGEMENT

The fully developed site will be covered by buildings, asphalt or concrete pavement, and irrigated landscaping. Final vegetative cover density for landscaped areas is to be 70% of pre-disturbed levels. These permanent, physical conditions act as erosion reduction methods. Pollutants typically associated with commercial development such as parking lot debris, sand, and oils are anticipated on this site. An existing offsite extended detention facility will provide permanent long term water quality treatment for the site.

I.C.5 INSPECTION and MAINTENANCE

These are the inspection and maintenance practices that will be used to maintain erosion and sediment controls.

1. All control measures will be inspected, cleaned, and maintained at least once each week and following a runoff producing rainfall event.

2. All measures will be maintained in good working order. If a repair is

necessary, it will be initiated within 24 hours of inspection.

3. Built up sediment will be removed from sediment control logs when it has reached a depth of ½ the diameter of the log.

4. Built up sediment will be removed from inlet protection and rock socks when it has reached a depth of ½ the diameter of the rock sock.

5. Temporary and permanent seeding and planting will be inspected for bare spots, washouts, and healthy growth.

6. A maintenance inspection report will be completed after each inspection and emailed or faxed to the County of El Paso construction inspector.

A complete written record of inspection and maintenance activities shall be kept in a log on site at all times.

REFERENCES

El Paso Engineering Criteria Manual and Drainage Criteria Manual, Volume 2
City of Colorado Springs Stormwater Construction Manual
City of Colorado Springs Drainage Criteria Manual, Volume 2
USDA Web Soil Survey

CARUBIA PROPERTIES - GRADING AND EROSION CONTROL PLAN (GEC PLAN)

LOT 2, BENT GRASS EAST COMMERCIAL FILING NO. 4

A PORTION OF THE NORTHEAST QUARTER OF SECTION 1,TOWNSHIP 13 SOUTH, RANGE 65 WEST OF THE 6TH P.M.
COUNTY OF EL PASO, STATE OF COLORADO

LEGAL DESCRIPTION

PARCEL A:
LOT 2, BENT GRASS EAST COMMERCIAL FILING NO. 4, COUNTY OF EL PASO, STATE OF COLORADO.
THE ABOVE LOT CONTAINS 33,776 SQUARE FEET, MORE OR LESS.

PARCEL B:
THOSE NON-EXCLUSIVE EASEMENT RIGHTS FOR VEHICULAR AND PEDESTRIAN INGRESS AND EGRESS AS CREATED BY RECIPROCAL ACCESS EASEMENT AND TEMPORARY CONSTRUCT/ON AND MAINTENANCE EASEMENT AGREEMENT RECORDED JUNE 04, 2013 UNDER RECEPTION NO. 213072561 AND FIRST AMENDMENT TO RECIPROCAL ACCESS EASEMENT AND TEMPORARY CONSTRUCTION
AND MAINTENANCE EASEMENT AGREEMENT RECORDED JULY 07, 2013 UNDER RECEPTION NO. 213098588.

PARCEL C:
THOSE NON-EXCLUSIVE EASEMENT RIGHTS FOR PEDESTRIAN AND VEHICULAR INGRESS AND EGRESS AS CREATED BY DECLARATION OF CROSS-ACCESS EASEMENT RECORDED NOVEMBER 3, 2023 UNDER RECEPTION NO. 223092254 AND JUNE 11, 2024 UNDER RECEPTION NO. 224044076.

BENCHMARK

1.5" ALUMINUM CAP PLS 30118 BEING THE SOUTHWEST CORNER OF LOT 1, BENT GRASS EAST COMMERCIAL FILING NO.4, RECORDED AT RECEPTION NO.224715331, IN THE RECORDS OF EL PASO COUNTY COLORADO.

ELEV.=6927.80' NVGD29

BASIS OF BEARINGS:

BEARINGS ARE BASED ON THE SOUTH LINE OF LOT 1, BENT GRASS EAST COMMERCIAL FILING NO.4, RECORDED AT RECEPTION NO. 224715331, IN THE RECORDS OF EL PASO COUNTY COLORADO. SAID LINE BEARS N89°30'48"E FROM MONUMENTS SHOWN.

PROPERTY TAX SCHEDULE NUMBER:

5301104005

APPLICANT/OWNER:

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8035 MERIDIAN PARK DRIVE
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719-640-1962
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LUCAS.CARUBIA@GMAIL.COM

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303-428-4895
CONTACT: PAUL BATTISTA
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CIVIL ENGINEER:

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LITTLETON, COLORADO 80128
303-232-8088
CONTACT: JERRY DAVIDSON, P.E.
JDAVIDSON@PERCEPTIONDESIGNGROUP.COM

LANDSCAPE ARCHITECT

JUMP DESIGN COMPANY
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303-282-0463
CONTACT: TOM JUMP
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SURVEYOR

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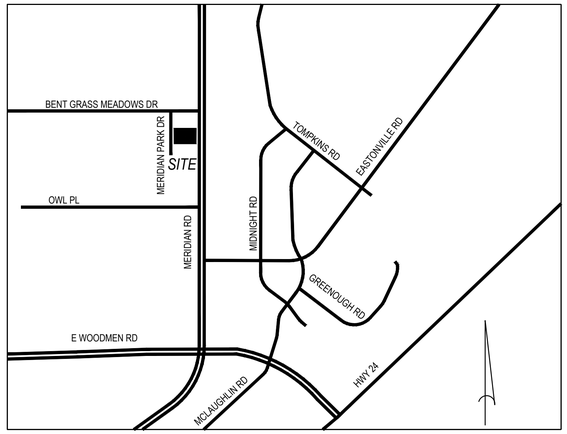
CONTACT: JUSTIN HAYES
JHAYES@ROSSIENGINEERING.NET



VICINITY MAP
1" = 1000' ±

LEGEND

PROPERTY LINE
PROPOSED HANDICAP PARKING STALL
10 — PROPOSED PARKING COUNT PER ROW
LS — PROPOSED LANDSCAPED AREA
PROPOSED SIDEWALK
PROPOSED HANDICAP RAMP
PROPOSED SITE SIGNAGE
PROPOSED HEAVY-DUTY CONCRETE PAVEMENT
PROPOSED HEAVY DUTY ASPHALT PAVEMENT
EXISTING CURB AND GUTTER
PROPOSED CURB AND GUTTER WITH SPILL PAN
PROPOSED CURB AND GUTTER WITH CATCH PAN
SAWCUT LINE
PROPOSED WALL

6260 — EXISTING CONTOUR
59 — PROPOSED CONTOUR
BW — FINISHED GRADE AT BOTTOM OF WALL
TW — TOP OF WALL
59.40 — PROPOSED SPOT ELEVATION
59.40 — EXISTING SPOT ELEVATION
FL — FLOWLINE ELEVATION
TC — TOP OF CURB ELEVATION
SW — SIDEWALK ELEVATION
HP — HIGH POINT ELEVATION
LP — LOW POINT ELEVATION
E/T/G/FO — EXISTING ELECTRIC/TELEPHONE/GAS/FIBER LINE
ST 18"RCP — EXISTING STORM SEWER WITH MANHOLE
S 8"SAN — EXISTING SANITARY SEWER WITH MANHOLE
6"WTR — EXISTING WATERLINE WITH HYDRANT
18"STM — PROPOSED STORM SEWER W/ MANHOLE AND INLET
4"SAN — PROPOSED SANITARY SEWER W/ MANHOLE AND CLEANOUT
6"WTR — PROPOSED WATERLINE AND HYDRANT
1"WTR — PROPOSED WATER SERVICE LINE
EASEMENT
T — TRANSFORMER

SHEET INDEX

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 REPORT.
PRINTED NAME: JERRY W. DAVIDSON, P.E. CO LIC. NO. 30226 DATE: _____
PHONE NUMBER: 303-232-8088

SEAL

OWNER'S STATEMENT

I, THE OWNER/DEVELOPER HAVE READ AND WILL COMPLY WITH THE REQUIREMENTS OF THE GRADING AND EROSION CONTROL PLAN.

_____ _____
OWNER SIGNATURE DATE

EL PASO COUNTY
GRADING AND EROSION CONTROL REVIEW

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 RESUBMITTED FOR APPROVAL, INCLUDING PAYMENT OF REVIEW FEES AT THE PLANNING AND COMMUNITY DEVELOPMENT DIRECTOR'S DISCRETION.

_____ DATE: _____
COUNTY PROJECT ENGINEER SIGNATURE

GEC COST ESTIMATE

Erosion Control Cost Estimate
AUTOWASH AT WOODMEN HILLS

BMP No.	BMP	ID	Unit	Installation Unit Cost	Quantity	Cost
1	Check Dam	CD	LF	$ 24.00		$ -
2	Compost Blanket	CB	SF	$ 0.36		$ -
3	Compost Filter Berm	CFB	LF	$ 2.00		$ -
4	Concrete Washout Area	CWA	EA	$ 100.00	1	$ 100.00
5	Construction Fence	CF	LF	$ 2.00	807	$ 1,614.00
6	Construction Markers	CM	LF	$ 0.20		$ -
7	Dew atering	DW	EA	$ 600.00		$ -
8	Temporary Compacted Berm	DD	LF	$ 1.60		$ -
9	Erosion Control Blanket	ECB	SY	$ 9.00		$ -
10	Inlet Protection	IP	EA	$ 200.00	1	$ 200.00
11	Reinforced Check Dam	RCD	LF	$ 36.00		$ -
12	Reinforced Rock Berm	RRB	LF	$ 9.00		$ -
13	RRB for Culvert Protection	RRC	LF	$ 9.00		$ -
14	Sediment Basin	SB	AC	$ 1,000.00	1	$ 1,000.00
15	Sediment Control Log	SCL	LF	$ 2.00	176	$ 352.00
16	Sediment Trap	ST	EA	$ 600.00		$ -
17	Seeding & Mulching (Less than 10 Acres)	SM	AC	$ 2,500.00	0.31	$ 775.00
	(Greater than 10 Acres)	SM	AC	$ 1,500.00		$ -
18	Silt Fence	SF	LF	$ 2.00	533	$ 1,066.00
19	Stabilized Staging Area	SSA	SY	$ 2.00	162	$ 324.00
20	Surface Roughening	SR	AC	$ 600.00		$ -
21	Temporary Slope Drain	TSD	LF	$ 30.00		$ -
22	Temporary Stream Crossing	TSC	EA	$ 1,000.00		$ -
23	Terracing	TER		$ -		$ -
24	Vehicle Tracking Control	VTC	EA	$ 1,000.00	1	$ 1,000.00
25	VTC w ith Wheel Wash	WW	EA	$ 1,500.00		$ -
26	Mobilization (Required on all projects)	MB	LS	$ 5,000.00	1	$ 5,000.00
27	Pond Maintenance Sediment Removal (Based on area tributary to the pond)	PM	AC	$ 1,000.00	1	$ 1,000.00
28	Rock/Curb Socks	RS	LF	$ 25.00	10	$ 250.00
29	Street Maintenance	SM	LM	$ 500.00	0.2	$ 100.00
	(Based on lane miles of streets w ithin project and fro			$ -		$ -
					Total Cost of BMPs	$ 12,781.00
					Maintenance	$ 5,112.40
					Total	**$ 17,893.40**

COLORADO 811
KNOW WHAT'S BELOW. CALL BEFORE YOU DIG.

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THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO EXISTING IMPROVEMENTS AND UTILITIES AND SHALL REPAIR ANY DAMAGE AT HIS EXPENSE.

PERCEPTION DESIGN GROUP, INC.
6901 SOUTH PIERCE STREET, SUITE 315 LITTLETON, CO 80128 303.232.8088
WWW.PERCEPTIONDESIGNGROUP.COM

PREPARED UNDER THE DIRECT SUPERVISION OF
JERRY W. DAVIDSON, P.E.
COLORADO REG # 30226
FOR AND ON BEHALF OF
PERCEPTION DESIGN GROUP, INC.

	DATE	DESCRIPTION
1	02/03/25	1ST SUBMITTAL

REVISIONS

GEC COVER SHEET

CARUBIA PROPERTIES
LOT 2, BENT GRASS EAST COMMERCIAL FILING NO. 4
COUNTY OF EL PASO, COLORADO

Design By: CLN
Approved By: JWD
Project No.: 2024-019

SHEET
C5.00

STANDARD NOTES FOR EL PASO COUNTY GRADING AND EROSION CONTROL PLANS

1. 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.
2. 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.
3. A SEPARATE STORMWATER MANAGEMENT PLAN (SMWP) 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 QUALIFIED STORMWATER MANAGER OR CERTIFIED EROSION CONTROL INSPECTOR AND SHALL BE LOCATED ON SITE AT ALL TIMES DURING CONSTRUCTION AND SHALL BE KEPT UP TO DATE WITH WORK PROGRESS AND CHANGES IN THE FIELD.
4. ONCE THE ESQCP IS APPROVED AND A "NOTICE TO PROCEED" HAS BEEN ISSUED, THE CONTRACTOR MAY INSTALL THE INITIAL STAGE EROSION AND SEDIMENT CONTROL MEASURES AS INDICATED ON THE APPROVED 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 STAFF.
5. CONTROL MEASURES MUST BE INSTALLED PRIOR TO COMMENCEMENT OF ACTIVITIES THAT MAY CONTRIBUTE POLLUTANTS TO STORMWATER. TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES FOR ALL SLOPES, CHANNELS, DITCHES, OR ANY DISTURBED LAND AREA SHALL BE COMPLETED IMMEDIATELY UPON COMPLETION OF THE DISTURBANCE.
6. ALL TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES SHALL BE MAINTAINED AND REMAIN IN EFFECTIVE OPERATING CONDITION UNTIL PERMANENT SOIL EROSION CONTROL MEASURES ARE IMPLEMENTED AND FINAL STABILIZATION IS ESTABLISHED. ALL PERSONS ENGAGED IN LAND DISTURBANCE ACTIVITIES SHALL ASSESS THE ADEQUACY OF CONTROL MEASURES AT THE SITE AND IDENTIFY IF CHANGES TO THOSE CONTROL MEASURES IS NEEDED TO ENSURE THE CONTINUED EFFECTIVE PERFORMANCE OF THE CONTROL MEASURES. ALL CHANGES TO TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES MUST BE INCORPORATED INTO THE STORMWATER MANAGEMENT PLAN PRIOR TO IMPLEMENTATION.
7. TEMPORARY STABILIZATION SHALL BE IMPLEMENTED ON DISTURBED AREAS AND STOCKPILES WHERE GROUND DISTURBING CONSTRUCTION ACTIVITY HAS PERMANENTLY CEASED OR TEMPORARILY CEASED FOR LONGER THAN 14 DAYS.
8. FINAL STABILIZATION MUST BE IMPLEMENTED AT ALL APPLICABLE CONSTRUCTION SITES. FINAL STABILIZATION IS ACHIEVED WHEN ALL GROUND DISTURBING ACTIVITIES ARE COMPLETE AND ALL DISTURBED AREAS EITHER HAVE A UNIFORM VEGETATIVE COVER WITH INDIVIDUAL PLAN DENSITY OF 70 PERCENT OF PRE-DISTURBANCE LEVELS ESTABLISHED OR EQUIVALENT PERMANENT ALTERNATIVE STABILIZATION METHOD IS IMPLEMENTED. ALL TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES SHALL BE REMOVED UPON FINAL STABILIZATION AND BEFORE PERMIT CLOSURE.
9. ALL PERMANENT STORMWATER MANAGEMENT FACILITIES SHALL BE INSTALLED AS DESIGNED IN THE APPROVED PLANS. ANY PROPOSED CHANGES THAT EFFECT THE DESIGN OR FUNCTION OF PERMANENT STORMWATER MANAGEMENT STRUCTURES MUST BE APPROVED BY THE ECM ADMINISTRATOR PRIOR TO IMPLEMENTATION.
10. EARTH DISTURBANCES SHALL BE CONDUCTED IN SUCH A MANNER SO AS TO EFFECTIVELY MINIMIZE 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. PRE-EXISTING VEGETATION SHALL BE PROTECTED AND MAINTAINED WITHIN 50 HORIZONTAL FEET OF A WATERS OF THE STATE UNLESS SHOWN TO BE INFEASIBLE AND SPECIFICALLY REQUESTED AND APPROVED.
11. COMPACTION OF SOIL MUST BE PREVENTED IN AREAS DESIGNATED FOR INFILTRATION CONTROL MEASURES OR WHERE FINAL STABILIZATION WILL BE ACHIEVED BY VEGETATIVE COVER. AREAS DESIGNATED FOR INFILTRATION CONTROL SHALL ALSO BE PROTECTED FROM SEDIMENTATION DURING CONSTRUCTION UNTIL FINAL STABILIZATION IS ACHIEVED. IF COMPACTION PREVENTION IS NOT FEASIBLE DUE TO SITE CONSTRAINTS, ALL AREAS DESIGNATED FOR INFILTRATION AND VEGETATION CONTROL MEASURES MUST BE LOOSENED PRIOR TO INSTALLATION OF THE CONTROL MEASURE(S).
12. ANY TEMPORARY OR PERMANENT FACILITY DESIGNED AND CONSTRUCTED FOR THE CONVEYANCE OF STORMWATER AROUND, THROUGH, OR FROM THE EARTH DISTURBANCE AREA SHALL BE A STABILIZED CONVEYANCE DESIGNED TO MINIMIZE EROSION AND THE DISCHARGE OF SEDIMENT OFF-SITE.
13. 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. CONCRETE WASHOUT SHALL NOT BE LOCATED IN AN AREA WHERE SHALLOW GROUNDWATER MAY BE PRESENT, OR WITHIN 50 FEET OF A SURFACE WATER BODY, CREEK OR STREAM.
14. DURING DEWATERING OPERATIONS, UNCONTAMINATED GROUND WATER MAY BE DISCHARGED ON-SITE, BUT SHALL NOT LEAVE THE SITE IN THE FORM OF SURFACE RUNOFF UNLESS AN APPROVED STATE DEWATERING PERMIT IS IN PLACE.
15. EROSION CONTROL BLANKETING OR OTHER PROTECTIVE COVERING SHALL BE USED ON SLOPES STEEPER THAN 3:1.
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. 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. CONTROL MEASURES MAY BE REQUIRED BY EL PASO COUNTY ENGINEERING IF DEEMED NECESSARY, BASED ON SPECIFIC CONDITIONS AND CIRCUMSTANCES.
18. TRACKING OF SOILS AND CONSTRUCTION DEBRIS OFF-SITE SHALL BE MINIMIZED. MATERIALS TRACKED OFF-SITE SHALL BE CLEANED UP AND PROPERLY DISPOSED OF IMMEDIATELY.
19. THE OWNER/DEVELOPER SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL CONSTRUCTION DEBRIS, DIRT, TRASH, ROCK, SEDIMENT, SOIL, AND SAND THAT MAY ACCUMULATE IN ROADS, STORM DRAINS AND OTHER DRAINAGE CONVEYANCE SYSTEM AND STORMWATER APPURTENANCES AS A RESULT OF SITE DEVELOPMENT.
20. 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.
21. NO CHEMICAL(S) HAVING THE POTENTIAL TO BE RELEASED IN STORMWATER ARE TO BE STORED OR USED ON-SITE UNLESS PERMISSION FOR THE USE OF SUCH CHEMICAL(S) IS GRANTED IN WRITING BY THE ECM ADMINISTRATOR. IN GRANTING APPROVAL FOR THE USE OF SUCH CHEMICAL(S), SPECIAL CONDITIONS AND MONITORING MAY BE REQUIRED.
22. BULK STORAGE OF PETROLEUM PRODUCTS OR OTHER ALLOWED LIQUID CHEMICALS IN EXCESS OF 55 GALLONS SHALL REQUIRE ADEQUATE SECONDARY CONTAINMENT PROTECTION TO CONTAIN ALL SPILLS ON-SITE AND TO PREVENT ANY SPILLED MATERIAL FROM ENTERING STATE WATERS, ANY SURFACE SURFACE OR SUBSURFACE STORM DRAINAGE SYSTEM OR OTHER FACILITIES.
23. NO PERSON SHALL CAUSE THE IMPEDIMENT OF STORMWATER FLOW IN THE CURB AND GUTTER OR DITCH EXCEPT WITH APPRVED SIDEMNT CONTROL MEASURES.
24. OWNER/DEVELOPER AND THEIR AGENTS 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 OF THE LAND DEVELOPMENT CODE, 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 OTHER LAWS, RULES, OR REGULATIONS OF OTHER FEDERAL, STATE, OR COUNTY AGENCIES, THE MOST RESTRICTIVE LAWS, RULES, OR REGULATIONS SHALL APPLY.
25. ALL CONSTRUCTION TRAFFIC MUST ENTER/EXIT THE SITE AT APPROVED CONSTRUCTION ACCESS POINTS.
26. PRIOR TO ACTUAL CONSTRUCTION THE PERMITEE SHALL VERIFY THE LOCATION OF EXISTING UTILITIES.
27. A WATER SOURCE SHALL BE AVAILABLE ON-SITE DURING EARTHWORK OPERATIONS AND SHALL BE UTILIZED AS REQUIRED TO MINIMIZE DUST FROM EARTHWORK EQUIPMENT AND WIND.
28. THE SOILS REPORT FOR THIS SITE HAS BEEN PREPARED BY ENTECH ENGINEERING, INC DATED NOVEMBER 2024 AND SHALL BE CONSIDERED A PART OF THESE PLANS.
29. AT LEAST TEN (10) DAYS PRIOR TO THE ANTICIPATED START OF CONSTRUCTION, FOR PROJECTS THAT WILL DISTURB ONE (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

GEC NOTES

NO GEO HAZARDS LOCATED ON SITE.

NO BATCH PLANTS LOCATED ON SITE.

NO PRESEVATION EASEMENT.

AREA OF DISTURBANCE = 1.15 AC

RECEIVING WATERS = BLACK SQUIRREL CREEK BASIN

EROSION CONTROL BLANKET TO BE PLACED ON ALL SLOPES 3:1 OR GREATER.

SEEDING AND MULCHING SHOWN FOR THE INTERIM CONDITION. SEE LANDSCAPE PLAN FOR FINAL LANDSCAPE STABILIZATION.

CONTRACTOR TO PROVIDE STREET SWEEPING ON ADJACENT STREETS.

CONTRACTOR TO PROVIDE REGULAR TRASH COLLECTION FOR SITE WASTE.

ESTIMATED STARTING DATE JUNE 1, 2024.

ESTIMATED COMPLETION AND FINAL STABILIZATION JANUARY 02, 2025.

PERMANENT WATER QUALITY IS PROVIDED AS PART OF THE BENT GRASS EAST AND A SAND FILTER BASIN ON SITE.

1675 CY OF CUT
55 CY OF FILL
1620 CY NET (CUT)

COLORADO 811
KNOW WHAT'S BELOW. CALL BEFORE YOU DIG.

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PERCEPTION
DESIGN GROUP, INC.
6955 SOUTH PIERCE STREET, SUITE 315, LITTLETON, CO 80128 303.232.6868
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PREPARED UNDER THE DIRECT SUPERVISION OF
JERRY W. DAVIDSON, P.E.
COLORADO REG # 30226
FOR AND ON BEHALF OF
PERCEPTION DESIGN GROUP, INC.

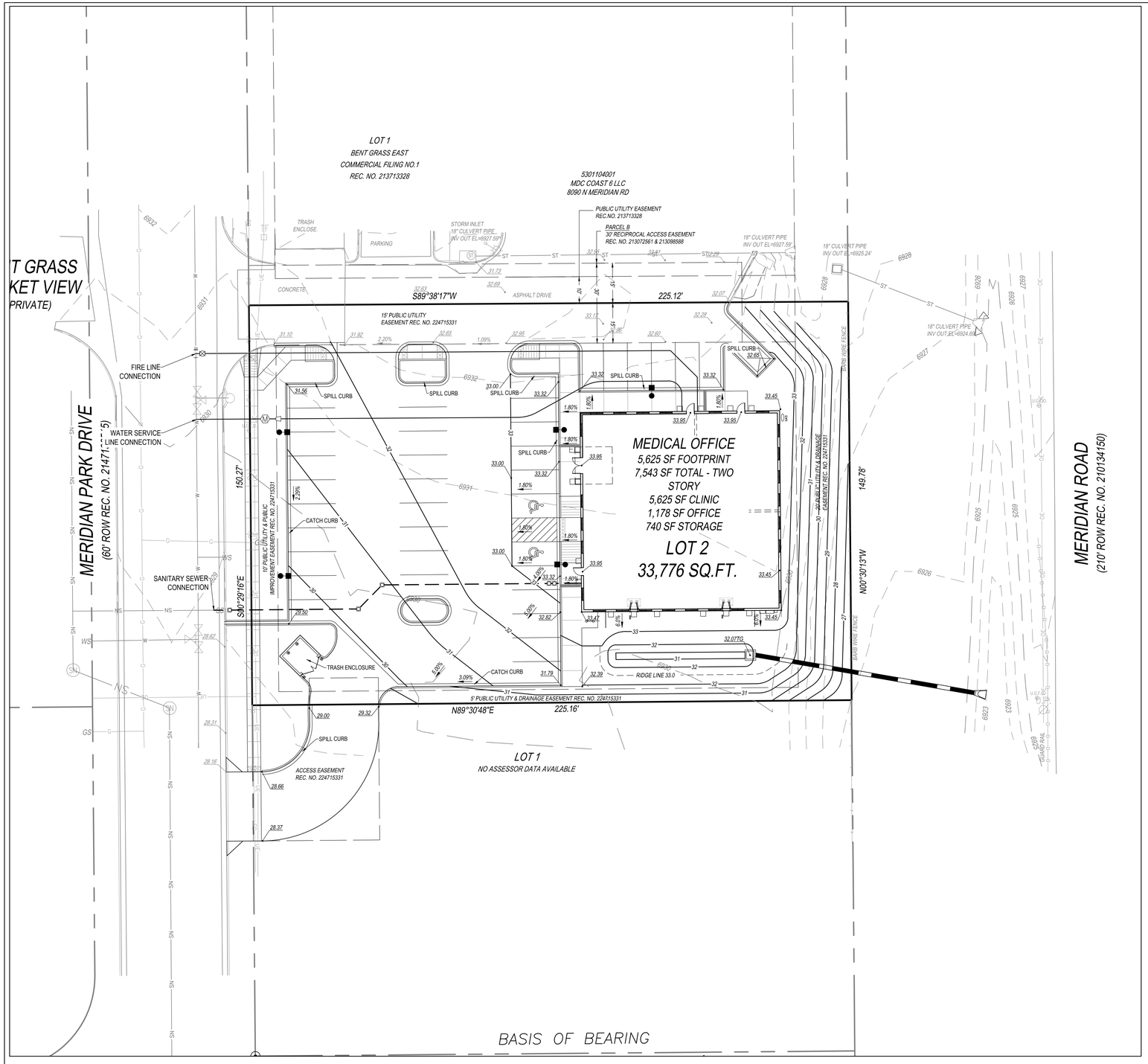
REVISIONS		
	DESCRIPTION	DATE
1	1ST SUBMITTAL	02/03/25

GEC NOTES SHEET

CARUBIA PROPERTIES
LOT 2, BENT GRASS EAST COMMERCIAL FILING NO. 4
COUNTY OF EL PASO, COLORADO

Design By: CLN
Approved By: JWD
Project No.: 2024-019

SHEET
C5.01



LEGEND

- PROPERTY LINE
- PROPOSED HANDICAP PARKING STALL
- (10) PROPOSED PARKING COUNT PER ROW
- LS PROPOSED LANDSCAPED AREA
- PROPOSED SIDEWALK
- PROPOSED HANDICAP RAMP
- FIRE HYDRANT
- PROPOSED SITE SIGNAGE
- PROPOSED HEAVY-DUTY CONCRETE PAVEMENT
- EXISTING CURB AND GUTTER
- PROPOSED CURB AND GUTTER
- PROPOSED SITE LIGHTING

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GRAPHIC SCALE
20 0 10 20 40
1 INCH = 20 FEET

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REVISIONS	DESCRIPTION	DATE
1	1ST SUBMITTAL	02/03/25

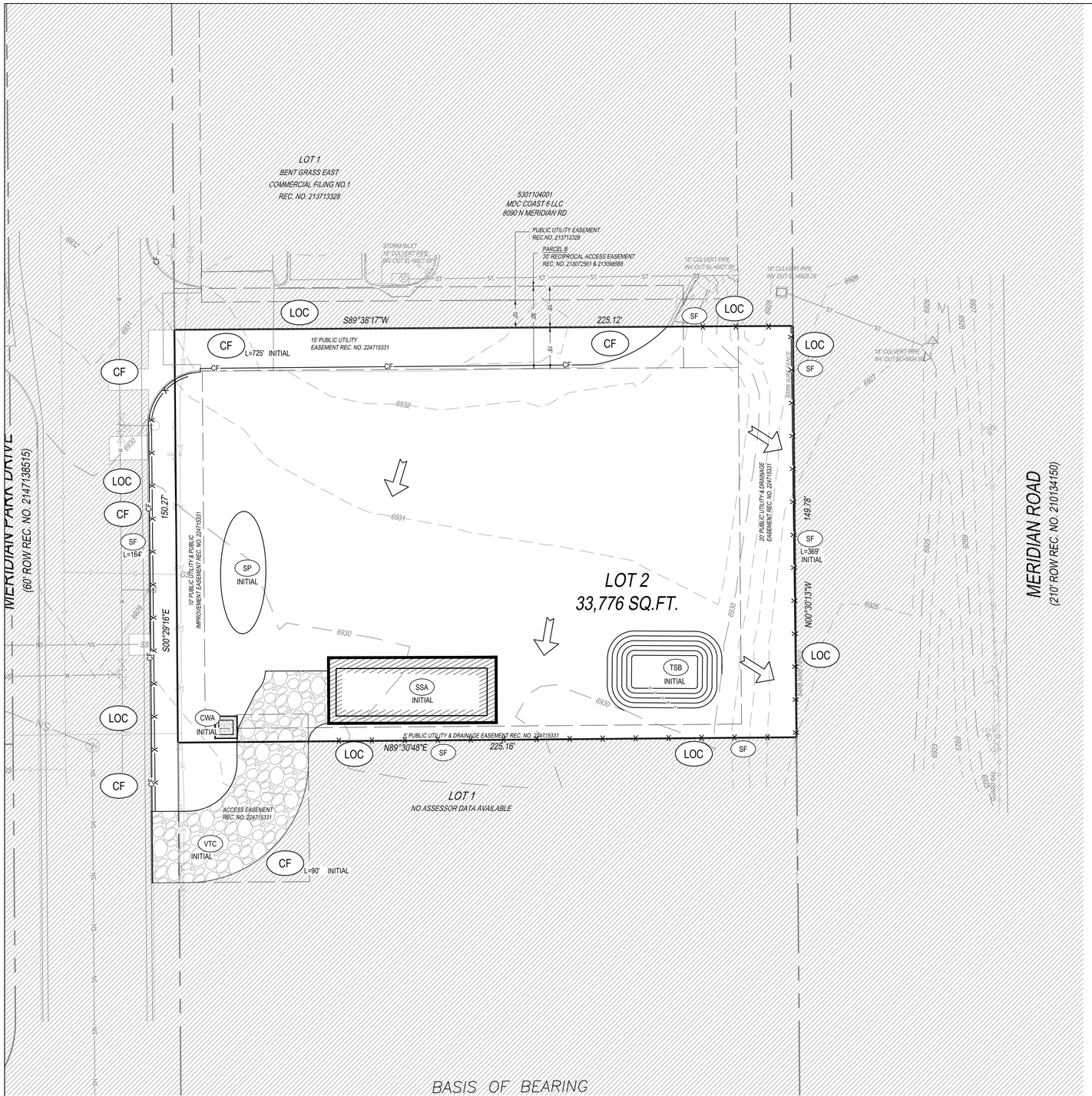
GRADING PLAN

CARUBIA PROPERTIES

LOT 2, BENT GRASS EAST COMMERCIAL FILING NO. 4
COUNTY OF EL PASO, COLORADO

Design By: CLN
Approved By: JWD
Project No.: 2024-019

SHEET
C5.02



LEGEND

- PROPERTY LINE
- SF — SILT FENCE
- SSA — STABILIZED STAGING AREA
- VTC — VEHICLE TRACKING CONTROL
- UN-DISTURBED AREA / DISTURBED AREA — LOC — LIMITS OF DISTURBANCE / CONSTRUCTION BOUNDARY
- TSB — TEMPORARY SEDIMENT BASIN
- TCB — TEMPORARY COMPACTED BERM
- PT — PORTABLE TOILET
- DRAINAGE DIRECTION
- SP — SOIL STOCKPILE
- CWA — CONCRETE WASHOUT AREA
- SCL — SEDIMENT CONTROL LOGS
- CF — CONSTRUCTION FENCE

GRADING AND EROSION CONTROL NOTES

NO NOTICEABLE VEGETATION ON SITE.

NO GEO HAZARDS LOCATED ON SITE.

NO BATCH PLANTS LOCATED ON SITE.

NO PRESEVATION EASEMENT.

AREA OF DISTURBANCE = 0.8735 AC

RECEIVING WATERS = FALCON DRAINAGE BASIN

EROSION CONTROL BLANKET TO BE PLACED ON ALL SLOPES 3:1 OR GREATER.

SEEDING AND MULCHING SHOWN FOR THE INTERIM CONDITION. SEE LANDSCAPE PLAN FOR FINAL LANDSCAPE STABILIZATION.

CONTRACTOR TO PROVIDE STREET SWEEPING ON ADJACENT STREETS.

CONTRACTOR TO PROVIDE REGULAR TRASH COLLECTION FOR SITE WASTE.

ESTIMATED STARTING DATE OCTOBER 1, 2025.

ESTIMATED COMPLETION AND FINAL STABILIZATION OCTOBER 02, 2026.

PERMANENT WATER QUALITY IS PROVIDED AS PART OF THE BENTON GRASS LOT 4 DETENTION POND AND AN ONSITE SAND FILTER BASIN.

14 CY OF CUT
1436 CY OF FILL
1422 CY NET (FILL)

GRAPHIC SCALE
20 0 10 20 40
1 INCH = 20 FEET

COLORADO 811
KNOW WHAT'S BELOW. CALL BEFORE YOU DIG.

THE TYPE, SIZE, LOCATION, AND NUMBER OF ALL KNOWN UNDERGROUND UTILITIES ARE APPROXIMATE WHEN SHOWN ON THE DRAWINGS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE EXISTENCE AND LOCATION OF ALL UNDERGROUND UTILITIES ON THE SITE, AND OFFSITE IN WORK AREAS. LOCATION OF EXISTING UTILITIES SHALL BE VERIFIED BY CONTRACTOR PRIOR TO DATE OF CONSTRUCTION. FOR INFORMATION CONTACT: UTILITY NOTIFICATION CENTER OF COLORADO (UNCC) – 1- 800-922-1987. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY SIZE AND HORIZONTAL AND VERTICAL LOCATIONS OF EXISTING FACILITIES PRIOR TO CONSTRUCTION AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO EXISTING IMPROVEMENTS AND UTILITIES AND SHALL REPAIR ANY DAMAGE AT HIS EXPENSE.

PERCEPTION
DESIGN GROUP, INC.
6901 SOUTH PIERCE STREET, SUITE 315 · LITTLETON, CO 80128 · 303.233.6868
WWW.PERCEPTIONDESIGNGROUP.COM

PREPARED UNDER THE DIRECT SUPERVISION OF
JERRY W. DAVIDSON, P.E.
COLORADO REG # 30226
FOR AND ON BEHALF OF
PERCEPTION DESIGN GROUP, INC.

REVISIONS	DESCRIPTION	DATE
1	1ST SUBMITTAL	02/03/25

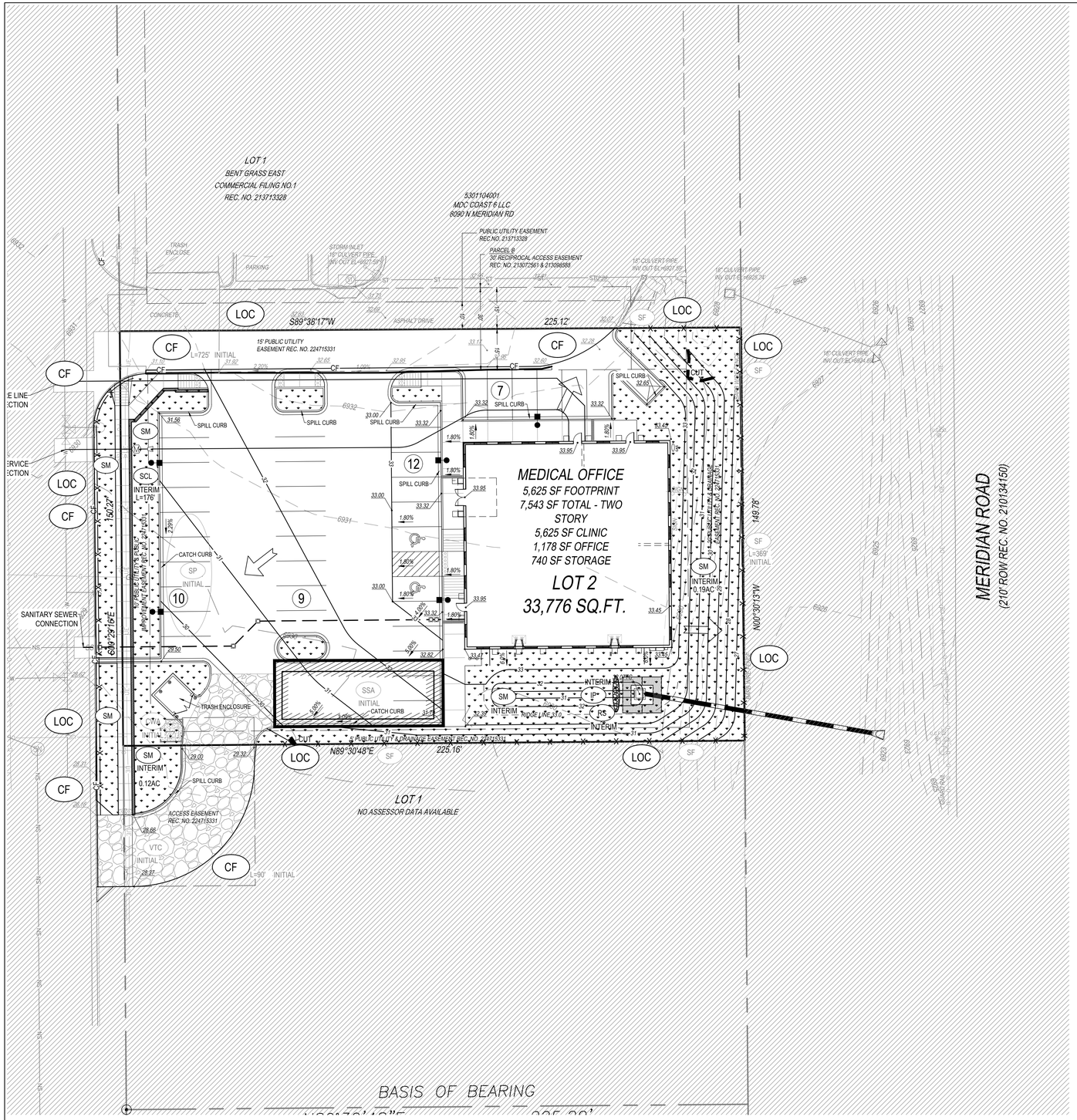
INITIAL GEC PLAN

CARUBIA PROPERTIES

LOT 2, BENT GRASS EAST COMMERCIAL FILING NO. 4
COUNTY OF EL PASO, COLORADO

Design By: CLN
Approved By: JWD
Project No.: 2024-019

SHEET
C5.10



LEGEND

- PROPERTY LINE
- SF — SILT FENCE
- SSA — STABILIZED STAGING AREA
- VTC — VEHICLE TRACKING CONTROL
- UN-DISTURBED AREA / DISTURBED AREA — LOC — LIMITS OF DISTURBANCE / CONSTRUCTION BOUNDARY
- SB — SEDIMENT BASIN
- TCB — TEMPORARY COMPACTED BERM
- PT — PORTABLE TOILET
- CWA — CONCRETE WASHOUT AREA
- IP — INLET PROTECTION
- SCL — SEDIMENT CONTROL LOG
- SM — SEED AND MULCH
- SP — SOIL STOCKPILE
- RS — ROCK SOCK
- DRAINAGE DIRECTION
- CF — CONSTRUCTION FENCE
- ECB — EROSION CONTROL BLANKET

GRADING AND EROSION CONTROL NOTES

NO NOTICEABLE VEGETATION ON SITE.

NO GEO HAZARDS LOCATED ON SITE.

NO BATCH PLANTS LOCATED ON SITE.

NO PRESEVATION EASEMENT.

AREA OF DISTURBANCE = 0.8735 AC

RECEIVING WATERS = FALCON DRAINAGE BASIN

EROSION CONTROL BLANKET TO BE PLACED ON ALL SLOPES 3:1 OR GREATER.

SEEDING AND MULCHING SHOWN FOR THE INTERIM CONDITION. SEE LANDSCAPE PLAN FOR FINAL LANDSCAPE STABILIZATION.

CONTRACTOR TO PROVIDE STREET SWEEPING ON ADJACENT STREETS.

CONTRACTOR TO PROVIDE REGULAR TRASH COLLECTION FOR SITE WASTE.

ESTIMATED STARTING DATE OCTOBER 1, 2025.

ESTIMATED COMPLETION AND FINAL STABILIZATION OCTOBER 02, 2026.

PERMANENT WATER QUALITY IS PROVIDED AS PART OF THE BENTON GRASS LOT 4 DETENTION POND AND AN ONSITE SAND FILTER BASIN.

14 CY OF CUT
1436 CY OF FILL
1422 CY NET (FILL)

GRAPHIC SCALE
20 0 10 20 40
1 INCH = 20 FEET

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REVISIONS		
DATE	DESCRIPTION	
02/03/25	1ST SUBMITTAL	

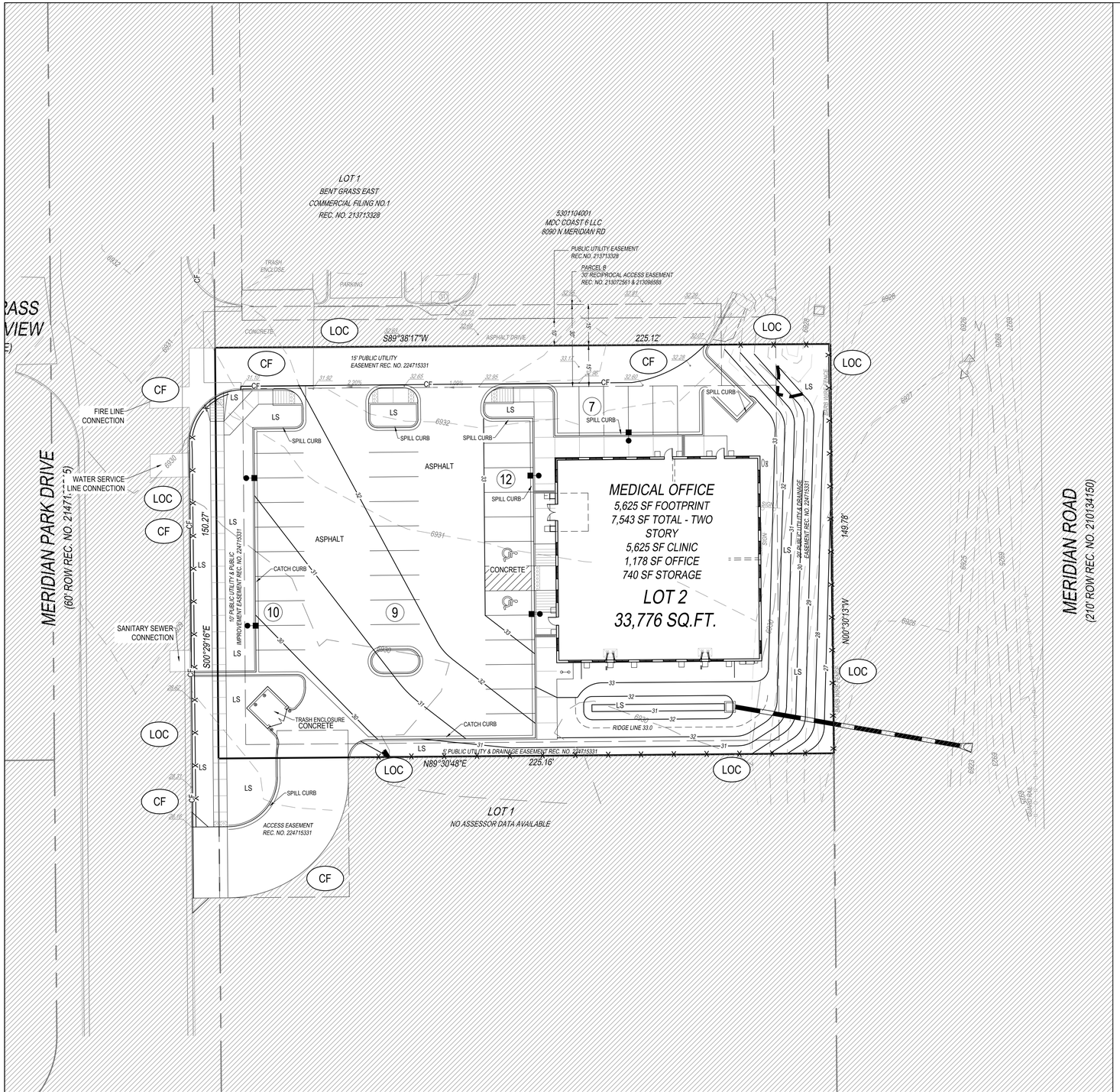
INTERIM GEC PLAN

CARUBIA PROPERTIES

LOT 2, BENT GRASS EAST COMMERCIAL FILING NO. 4
COUNTY OF EL PASO, COLORADO

Design By: CLN
Approved By: JWD
Project No.: 2024-019

SHEET
C5.11



LEGEND

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REVISIONS

FINAL GEC PLAN

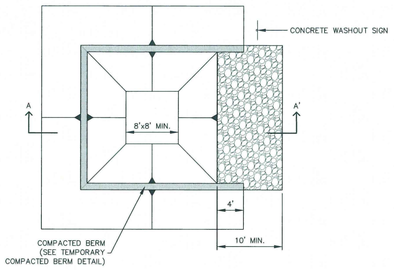
CARUBIA PROPERTIES

LOT 2, BENT GRASS EAST COMMERCIAL FILING NO. 4
COUNTY OF EL PASO, COLORADO

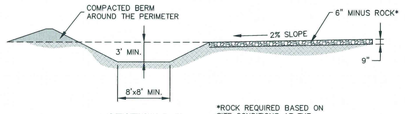
Design By: CLN
Approved By: JWD
Project No.: 2024-019

SHEET

C5.12



CONCRETE WASHOUT AREA PLAN



SECTION A-A'

*ROCK REQUIRED BASED ON SITE CONDITIONS AT THE DISCRETION OF THE GEC INSPECTOR

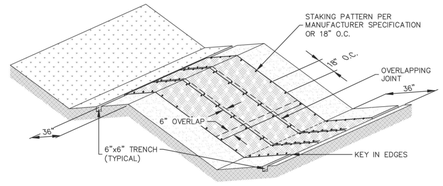
CWA

STORMWATER ENTERPRISE

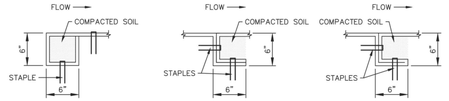
CONCRETE WASHOUT AREA

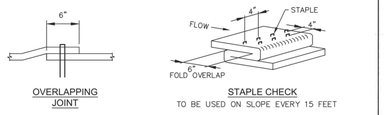
APPROVED: SWENT MANAGER

ISSUED: 10/7/19 | REVISED: 8/19/2020 | DRAWING NO. 900-CWA-1



EROSION CONTROL BLANKET





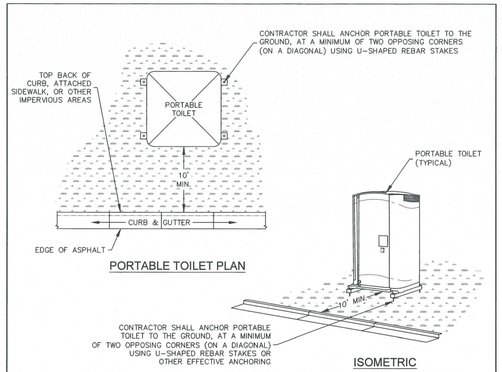
ECB

STORMWATER ENTERPRISE

EROSION CONTROL BLANKET

APPROVED: SWENT MANAGER

ISSUED: 10/7/19 | REVISED: 8/19/2020 | DRAWING NO. 900-ECB-1



PORTABLE TOILET PLAN

ISOMETRIC

INSTALLATION NOTES

1. PORTABLE TOILETS SHALL BE PLACED A MINIMUM OF 10 FEET BEHIND ALL CURBS, SIDEWALKS, AND OTHER IMPERVIOUS AREAS; 50 FEET FROM STORM INLETS, AND 100 FEET FROM WATERWAYS.
2. PORTABLE TOILETS IN THE RIGHT-OF-WAY ARE REQUIRED TO BE PLACED ON MOBILE TRAILERS AND MUST BE ANCHORED OR WEIGHTED DOWN. PORTABLE TOILETS MAY BE INSTALLED IN ACCORDANCE WITH NOTE #1 IN STAGING AREAS/YARDS.
3. PORTABLE TOILETS SHALL BE SECURELY ANCHORED TO THE GROUND USING U-SHAPED REBAR STAKES, OR OTHER EFFECTIVE ANCHORING.
4. ANCHORING SHALL BE POSITIONED ON AT LEAST TWO OPPOSING (DIAGONAL) CORNERS.
5. TOILET CONTAINMENT PANS MAY BE USED IN PLACE OF A TRAILER AT THE GEC INSPECTOR'S DISCRETION. TOILET CONTAINMENT PANS MUST BE ANCHORED IN PLACE AND MUST NOT BE USED WITHIN THE CITY R.O.W.

MAINTENANCE NOTES

1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. PORTABLE TOILETS SHALL BE SERVICED AT THE NECESSARY INTERVALS TO ELIMINATE THE POSSIBILITY OF OVERFLOW.
3. WHEN THE PORTABLE TOILETS ARE REMOVED, ANY DISTURBED AREAS ASSOCIATED WITH THE INSTALLATION, MAINTENANCE, AND/OR REMOVAL OF THE TOILETS MUST BE PERMANENTLY STABILIZED.

PT

PORTABLE TOILET

APPROVED: SWENT MANAGER

ISSUED: 2/19/19 | REVISED: 8/19/2020 | DRAWING NO. 900-PTM

INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   -LOCATION OF CONCRETE WASHOUT AREA
2. LOCATE AT LEAST 50' AWAY FROM STATE WATERS MEASURED HORIZONTALLY.
3. AN IMPERMEABLE LINER (16 MIL. MINIMUM THICKNESS) IS REQUIRED IF CONCRETE WASH AREA IS LOCATED WITHIN 400' OF STATE WATERS OR 1000' OF WELLS OR DRINKING WATER SOURCES.
4. DO NOT LOCATE IN AREAS WHERE SHALLOW GROUNDWATER MAY BE PRESENT.
5. THE CONCRETE WASH AREA SHALL BE INSTALLED PRIOR TO CONCRETE PLACEMENT ON SITE.
6. CONCRETE WASH AREA SHALL INCLUDE A FLAT SUBSURFACE PIT THAT IS AT LEAST 8' BY 8'.
7. BERM SURROUNDING SIDES AND BACK OF CONCRETE WASH AREA SHALL HAVE A MINIMUM HEIGHT OF 2 FEET.
8. CONCRETE WASH AREA ENTRANCE SHALL BE SLOPED 2% TOWARDS THE CONCRETE WASH AREA.
9. SIGNS SHALL BE PLACED AT THE CONCRETE WASH AREA.
10. USE EXCAVATED MATERIAL FOR PERIMETER BERM CONSTRUCTION.

MAINTENANCE NOTES

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2. THE CONCRETE WASH AREA SHALL BE REPAIRED, CLEANED, OR ENLARGED AS NECESSARY TO MAINTAIN CAPACITY FOR CONCRETE WASTE. CONCRETE MATERIALS ACCUMULATED IN THE PIT SHALL BE REMOVED ONCE THE MATERIALS HAVE REACHED A DEPTH OF ⅔ THE HEIGHT OF THE CONCRETE WASH AREA.
3. CONCRETE WASHOUT WATER, WASTED PIECES OF CONCRETE, AND ALL OTHER DEBRIS IN THE SUBSURFACE PIT SHALL BE TRANSPORTED FROM THE JOB SITE IN A WATER-TIGHT CONTAINER AND DISPOSED OF PROPERLY.
4. THE CONCRETE WASH AREA SHALL REMAIN IN PLACE UNTIL ALL CONCRETE FOR THE PROJECT IS PLACED.
5. PERMANENTLY STABILIZE AREA AFTER CONCRETE WASH AREA IS REMOVED.

CWA

STORMWATER ENTERPRISE

CONCRETE WASHOUT AREA

APPROVED: SWENT MANAGER

ISSUED: 10/7/19 | REVISED: 8/19/2020 | DRAWING NO. 900-CWA-2

INSTALLATION NOTES

1. 100% NATURAL AND BIODEGRADABLE MATERIALS ARE REQUIRED FOR EROSION CONTROL BLANKETS. TRM PRODUCTS MAY BE USED WHERE APPROPRIATE AS DESIGNATED BY THE ENGINEER.
2. IN AREAS WHERE EROSION CONTROL BLANKETS ARE SHOWN ON THE PLANS, THE PERMITTEE SHALL PLACE TOPSOIL AND PERFORM FINAL GRADING, SURFACE PREPARATION, AND SEEDING AND MULCHING. SUBGRADE SHALL BE SMOOTH AND MOIST PRIOR TO EROSION CONTROL BLANKET INSTALLATION, AND THE EROSION CONTROL BLANKET SHALL BE IN FULL CONTACT WITH THE SUBGRADE. NO GAPS OR VOIDS SHALL EXIST UNDER THE BLANKET.
3. PERIMETER ANCHOR TRENCH SHALL BE USED ALONG THE OUTSIDE PERIMETER OF ALL BLANKET AREAS.
4. JOINT ANCHOR TRENCH SHALL BE USED TO JOIN ROLLS OF EROSION CONTROL BLANKETS TOGETHER (LONGITUDINALLY AND TRANSVERSELY) FOR ALL EROSION CONTROL BLANKETS.
5. INTERMEDIATE CHECK SLOT OR STAPLE CHECK SHALL BE INSTALLED EVERY 15' DOWN SLOPES. IN DRAINAGEWAYS, INSTALL CHECK SLOTS EVERY 25' PERPENDICULAR TO FLOW DIRECTION.
6. OVERLAPPING JOINT DETAIL SHALL BE USED TO JOIN ROLLS OF EROSION CONTROL BLANKETS TOGETHER FOR EROSION CONTROL BLANKETS ON SLOPES.
7. MATERIAL SPECIFICATIONS OF EROSION CONTROL BLANKETS SHALL CONFORM TO TABLE ECB-1.
8. ANY AREAS OF SEEDING AND MULCHING DISTURBED IN THE PROCESS OF INSTALLING EROSION CONTROL BLANKETS SHALL BE RESEEDED AND MULCHED.
9. STRAW EROSION CONTROL BLANKETS SHALL NOT BE USED WITHIN STREAMS AND DRAINAGE CHANNELS.
10. COMPACT ALL TRENCHES.

MAINTENANCE NOTES

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2. EROSION CONTROL BLANKETS SHALL BE LEFT IN PLACE TO EVENTUALLY BIODEGRADE. TRM MUST BE REMOVED AT THE DISCRETION OF THE GEC INSPECTOR.
3. ANY EROSION CONTROL BLANKET PULLED OUT, TORN, OR OTHERWISE DAMAGED SHALL BE REPAIRED OR REINSTALLED. ANY SUBGRADE AREAS BELOW GEOTEXTILE THAT HAVE ERODED TO CREATE A VOID UNDER THE BLANKET, OR THAT REMAIN DEVOID OF GRASS SHALL BE REPAIRED, RESEEDED AND MULCHED AND THE EROSION CONTROL BLANKET REINSTALLED.

TABLE ECB-1, EROSION CONTROL BLANKET MATERIAL SPECIFICATIONS

TYPE	COCONUT CONTENT	STRAW CONTENT	EXCELSIOR CONTENT	RECOMMENDED NETTING
STRAW	–	100%	–	DOUBLE/ NATURAL
STRAW-COCONUT	30% MIN.	70% MAX.	–	DOUBLE/ NATURAL
COCONUT	100%	–	–	DOUBLE/ NATURAL
EXCELSIOR	–	–	100%	DOUBLE/ NATURAL

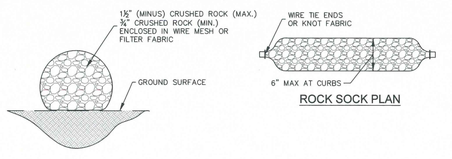
ECB

STORMWATER ENTERPRISE

EROSION CONTROL BLANKET

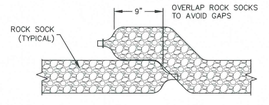
APPROVED: SWENT MANAGER

ISSUED: 10/7/19 | REVISED: 8/19/2020 | DRAWING NO. 900-ECB-2



ROCK SOCK SECTION

ROCK SOCK PLAN



ROCK SOCK OVERLAP

GRADATION TABLE

	MASS PERCENT PASSING SQUARE MESH SIEVES
	No. 4
2" 1½" 1" ¾" ⅜"	100 90-100 20-55 0-15 0-5

MATCHES SPECIFICATIONS FOR No. 4 COARSE AGGREGATE FOR CONCRETE PER AASHTO M-43. ALL ROCK SHALL BE FRACTURED FACE, ALL SIDES

INSTALLATION NOTES

1. CRUSHED ROCK SHALL BE BETWEEN MAX. 1½" (MINUS) IN SIZE WITH A FRACTURED FACE (ALL SIDES) AND SHALL COMPLY WITH GRADATION SHOWN ON THIS SHEET AND MIN. ¾" CRUSHED ROCK.
2. WIRE MESH SHALL HAVE OPENINGS SMALLER THAN THE SMALLEST SIZE ROCK.
3. WIRE MESH SHALL BE SECURED USING 'HOG RINGS' OR WIRE TIES AT 6" CENTERS ALONG ALL JOINTS AND AT 2" CENTERS ON ENDS OF SOCKS.

MAINTENANCE NOTES

1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. ROCK SOCKS SHALL BE REPLACED IF THEY BECOME HEAVILY SOILED OR DAMAGED BEYOND REPAIR.
3. ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN THE DEPTH REACHES ½ OF THE HEIGHT OF THE ROCK SOCK.
4. ROCK SOCKS ARE TO REMAIN IN PLACE UNTIL DISTURBED AREA IS STABILIZED.
5. PERMANENTLY STABILIZE AREA AFTER ROCK SOCKS HAVE BEEN REMOVED.

RS

STORMWATER ENTERPRISE

ROCK SOCK

APPROVED: SWENT MANAGER

ISSUED: 10/7/19 | REVISED: 8/19/2020 | DRAWING NO. 900-RS

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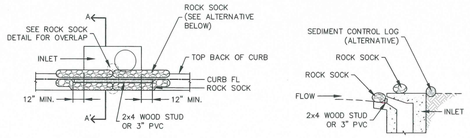
GEC DETAILS

CARUBIA PROPERTIES
LOT 2, BENT GRASS EAST COMMERCIAL FILING NO. 4
COUNTY OF EL PASO, COLORADO

Design By: CLN
Approved By: JWD
Project No.: 2024-019

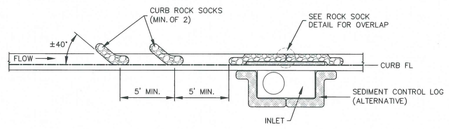
SHEET

C5.90



CURB INLET PROTECTION PLAN

SECTION A-A'



CURB ROCK SOCKS UPSTREAM OF INLET PROTECTION

INSTALLATION NOTES

1. SEE ROCK SOCK DETAIL FOR INSTALLATION REQUIREMENTS.
2. PLACEMENT OF THE ROCK SOCK SHALL BE APPROXIMATELY 40 DEGREES FROM THE CURB.
3. ROCK SOCKS ARE TO BE FLUSH WITH THE CURB AND SPACED A MINIMUM OF 5' APART. AT LEAST TWO CURB ROCK SOCKS IN SERIES ARE REQUIRED UPSTREAM OF ON-GRADIENT INLETS.
5. ADDITIONAL ROCK SOCKS MAY BE REQUIRED AT GEC INSPECTOR'S DISCRETION.

MAINTENANCE NOTES

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2. ACCUMULATED SEDIMENT MUST BE REMOVED WHEN THE HEIGHT REACHES ½ OF THE DESIGN DEPTH OF THE INLET BARRIER.
3. ROCK SOCKS MUST REMAIN UNTIL THE UPSTREAM DISTURBANCE AREA IS STABILIZED.
4. PERMANENTLY STABILIZE AREA BEHIND INLET AFTER ROCK SOCKS ARE REMOVED WHEN REMOVAL IS APPROPRIATE.

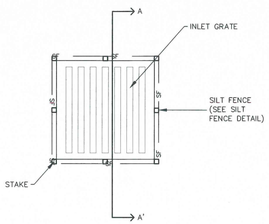
IP-1

STORMWATER ENTERPRISE

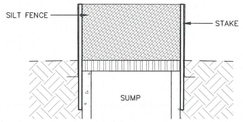
ON-GRADE INLET PROTECTION

APPROVED: SWENT MANAGER

ISSUED:	REVISED:	DRAWING NO.
10/7/19	8/19/2020	900-IP-1



SILT FENCE SUMP INLET PROTECTION PLAN



SECTION A-A'

INSTALLATION NOTES

1. SEE SILT FENCE DETAIL FOR INSTALLATION REQUIREMENTS.
2. POSTS SHALL BE PLACED AT EACH CORNER OF THE INLET AND AROUND THE EDGES AT A MAXIMUM SPACING OF THREE FEET.
3. SILT FENCE FABRIC SHOULD HAVE A FLOW RATE IN EXCESS OF 30 GALLONS PER MINUTE PER SQUARE YARD SO AS TO ALLOW SOME WATER FLOW AND NOT DAM THE WATER. STANDARD, LOW-FLOW SILT FENCE FABRIC WILL NOT BE ALLOWED.

MAINTENANCE NOTES

1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. ACCUMULATED SEDIMENT MUST BE REMOVED WHEN THE HEIGHT REACHES ½ OF THE DESIGN DEPTH OF THE INLET BARRIER.
3. SILT FENCE MUST REMAIN UNTIL THE UPSTREAM DISTURBANCE AREA IS STABILIZED.
4. PERMANENTLY STABILIZE AREA AROUND INLET AFTER SILT FENCE IS REMOVED WHEN REMOVAL IS APPROPRIATE.

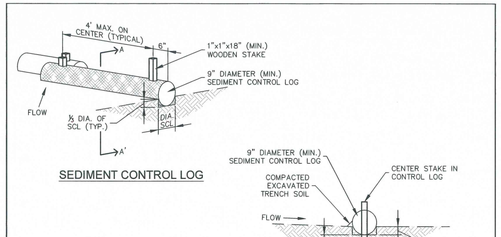
IP-3

STORMWATER ENTERPRISE

SUMP INLET PROTECTION

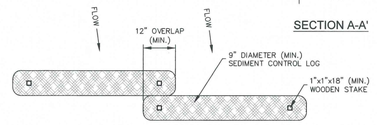
APPROVED: SWENT MANAGER

ISSUED:	REVISED:	DRAWING NO.
10/7/19	8/19/2020	900-IP-3



SEDIMENT CONTROL LOG

SECTION A-A'



SEDIMENT CONTROL LOG JOINTS

INSTALLATION NOTES

1. ALL SEDIMENT CONTROL LOGS MUST BE EMBEDDED TO ⅓ OF THE HEIGHT OF THE LOG
2. LARGER DIAMETER SEDIMENT CONTROL LOGS NEED TO BE EMBEDDED DEEPER.
3. PLACE SEDIMENT CONTROL LOG AGAINST SIDEWALK OR BACK OF CURB WHEN ADJACENT TO THESE FEATURES.
4. SEDIMENT CONTROL LOGS SHALL CONSIST OF STRAW, COMPOST, EXCELSIOR OR COCONUT FIBER, AND SHALL BR FREE FROM ANY NOXIOUS WEED SEEDS OF DEFECTS INCLUDING RIPS, HOLES AND OBVIOUS WEAR.
5. IF USING AS SLOPE PROTECTION, INSTALL SEDIMENT CONTROL LOGS ALONG THE CONTOUR.

MAINTENANCE NOTES

1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. ACCUMULATED SEDIMENT MUST BE REMOVED WHEN THE HEIGHT REACHES ½ OF THE HEIGHT OF THE SEDIMENT CONTROL LOG.
3. PERMANENTLY STABILIZE AREA AFTER SEDIMENT CONTROL LOGS HAVE BEEN REMOVED.

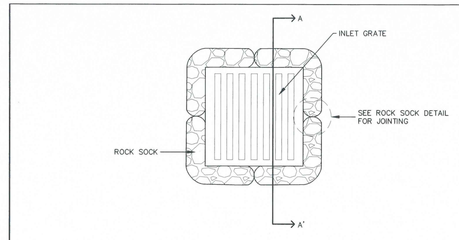
SCL

STORMWATER ENTERPRISE

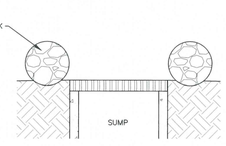
SEDIMENT CONTROL LOGS

APPROVED: SWENT MANAGER

ISSUED:	REVISED:	DRAWING NO.
10/7/19	8/19/2020	900-SCL



ROCK SOCK SUMP INLET PROTECTION PLAN



SECTION A-A'

INSTALLATION NOTES

1. SEE ROCK SOCK DETAIL FOR INSTALLATION REQUIREMENTS.
2. SEDIMENT CONTROL LOGS MAY BE USED IN PLACE OF ROCK SOCKS IN PERVIOUS AREAS. INSTALL PER SEDIMENT CONTROL LOG DETAIL.
3. CONTROL MEASURES MUST BE WRAPPED AROUND INLET AS TIGHTLY AS POSSIBLE.

MAINTENANCE NOTES

1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. ACCUMULATED SEDIMENT MUST BE REMOVED WHEN THE HEIGHT REACHES ½ OF THE DESIGN DEPTH OF THE INLET BARRIER.
3. ROCK SOCKS MUST REMAIN UNTIL THE UPSTREAM DISTURBANCE AREA IS STABILIZED.
4. PERMANENTLY STABILIZE AREA AROUND INLET AFTER ROCK SOCKS ARE REMOVED WHEN REMOVAL IS APPROPRIATE.

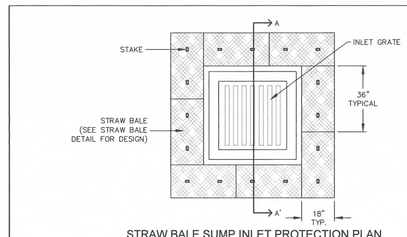
IP-2

STORMWATER ENTERPRISE

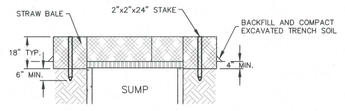
SUMP INLET PROTECTION

APPROVED: SWENT MANAGER

ISSUED:	REVISED:	DRAWING NO.
10/7/19	8/19/2020	900-IP-2



STRAW BALE SUMP INLET PROTECTION PLAN



SECTION A-A'

INSTALLATION NOTES

1. BALES SHALL BE PLACED IN A SINGLE ROW AROUND THE INLET WITH THE ENDS OF THE BALES TIGHTLY ABUTTING ONE ANOTHER.
2. STRAW BALES SHALL CONSIST OF CERTIFIED WEED FREE STRAW OR HAY. LOCAL JURISDICTIONS MAY REQUIRE PROOF THAT BALES ARE WEED FREE.
3. STRAW BALES SHALL CONSIST OF APPROXIMATELY 5 CUBIC FEET OF STRAW OR HAY AND WEIGH NOT LESS THAN 35 POUNDS.
4. STRAW BALE DIMENSIONS SHALL BE APPROXIMATELY 36"x18"x18".
5. A UNIFORM ANCHOR TRENCH SHALL BE EXCAVATED TO A DEPTH OF 4". STRAW BALES SHALL BE PACED SO THAT THE BINDING TWINE IS ENCOMPASSING THE VERTICAL SIDES OF THE BALE(S).
6. TWO (2) WOODEN STAKES SHALL BE USED TO HOLD EACH BALE IN PLACE. WOODEN STAKED SHALL BE 2"x2"x24 (MIN.)". WOODEN STAKES SHALL BE DRIVEN A MINIMUM OF 6" INTO THE GROUND.

MAINTENANCE NOTES

1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. ACCUMULATED SEDIMENT MUST BE REMOVED WHEN THE HEIGHT REACHES ½ OF THE DESIGN DEPTH OF THE INLET BARRIER.
3. STRAW BALES MUST REMAIN UNTIL THE UPSTREAM DISTURBANCE AREA IS STABILIZED.
4. PERMANENTLY STABILIZE AREA AROUND INLET AFTER STRAW BALES ARE REMOVED WHEN REMOVAL IS APPROPRIATE.
5. STRAW BALES SHALL BE REPLACED IF THEY BECOME HEAVILY SOILED, ROTTEN OR DAMAGED BEYOND REPAIR.

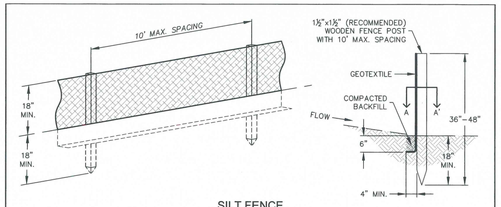
IP-4

STORMWATER ENTERPRISE

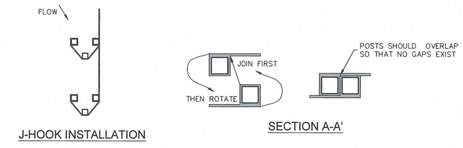
SUMP INLET PROTECTION

APPROVED: SWENT MANAGER

ISSUED:	REVISED:	DRAWING NO.
10/7/19	8/19/2020	900-IP-4



SILT FENCE



J-HOOK INSTALLATION

SECTION A-A'

INSTALLATION NOTES

1. SILT FENCE MUST BE PLACED ON A FLAT SURFACE 2'–5' AWAY FROM TOE OF THE SLOPE TO ALLOW FOR PONDING AND DEPOSITION.
2. COMPACT THE TRENCH USING A JUMPING JACK OR WHEEL ROLLING TO THE POINT THAT THE FENCE RESISTS BEING PULLED OUT OF THE GROUND BY HAND.
3. SILT FENCE SHALL BE TAUT WITH NO SAGS AFTER IT HAS BEEN ANCHORED.
4. FABRIC SHALL BE ATTACHED TO POSTS WITH 1" HEAVY DUTY STAPLES OR 1" NAILS. THESE SHOULD BE PLACED VERTICALLY DOWN THE POST, 3" APART.
5. THE PREFERRED INSTALLATION METHOD USES A TRENCHER OR SILT FENCE INSTALLATION DEVICE.
6. INSTALL SILT FENCE ALONG THE CONTOUR OF THE SLOPES OR IN A MANNER TO AVOID CREATING CONCENTRATED FLOW (SUCH AS A "J-HOOK" INSTALLATION).

MAINTENANCE NOTES

1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. ACCUMULATED SEDIMENT MUST BE REMOVED WHEN THE HEIGHT REACHES ½ OF THE DESIGN HEIGHT OF THE SILT FENCE.
3. SILT FENCE MUST REMAIN UNTIL THE UPSTREAM DISTURBANCE AREA IS STABILIZED.
4. PERMANENTLY STABILIZE AREA AFTER SILT FENCE IS REMOVED.

SF

STORMWATER ENTERPRISE

SILT FENCE

APPROVED: SWENT MANAGER

ISSUED:	REVISED:	DRAWING NO.
10/7/19	8/19/2020	900-SF

PERCEPTION
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PREPARED UNDER THE DIRECT SUPERVISION OF
JERRY W. DAVIDSON, P.E.
COLORADO REG # 30226
FOR AND ON BEHALF OF
PERCEPTION DESIGN GROUP, INC.

REVISIONS		
	DATE	DESCRIPTION
1	02/03/25	1ST SUBMITTAL

GEC DETAILS

CARUBIA PROPERTIES
LOT 2, BENT GRASS EAST COMMERCIAL FILING NO. 4
COUNTY OF EL PASO, COLORADO

Design By: CLN
Approved By: JWD
Project No.: 2024-019

SHEET

C5.91

SEEDING & MULCHING

ALL SOIL TESTING, SOILS AMENDMENT AND FERTILIZER DOCUMENTATION, AND SEED LOAD AND BAG TICKETS MUST BE ADDED TO THE CSWMP.

SOIL PREPARATION

1. IN AREAS TO BE SEEDED, THE UPPER 6 INCHES OF THE SOIL MUST NOT BE HEAVILY COMPACTED, AND SHOULD BE IN FRIABLE CONDITION. LESS THAN 85% STANDARD PROCTOR DENSITY IS ACCEPTABLE. AREAS OF COMPACTION OR GENERAL CONSTRUCTION ACTIVITY MUST BE SCARIFIED TO A DEPTH OF 6 TO 12 INCHES PRIOR TO SPREADING TOPSOIL TO BREAK UP COMPACTED LAYERS AND PROVIDE A BLENDING ZONE BETWEEN DIFFERENT SOIL LAYERS.
2. AREAS TO BE PLANTED SHALL HAVE AT LEAST 4 INCHES OF TOPSOIL SUITABLE TO SUPPORT PLANT GROWTH.
3. THE CITY RECOMMENDS THAT EXISTING AND/OR IMPORTED TOPSOIL BE TESTED TO IDENTIFY SOIL DEFICIENCIES AND ANY SOIL AMENDMENTS NECESSARY TO ADDRESS THESE DEFICIENCIES. SOIL AMENDMENTS AND/OR FERTILIZERS SHOULD BE ADDED TO CORRECT TOPSOIL DEFICIENCIES BASED ON SOIL TESTING RESULTS.
4. TOPSOIL SHALL BE PROTECTED DURING THE CONSTRUCTION PERIOD TO RETAIN ITS STRUCTURE AVOID COMPACTION, AND TO PREVENT EROSION AND CONTAMINATION. STRIPPED TOPSOIL MUST BE STORED IN AN AREA AWAY FROM MACHINERY AND CONSTRUCTION OPERATIONS, AND CARE MUST BE TAKEN TO PROTECT THE TOPSOIL AS A VALUABLE COMMODITY. TOPSOIL MUST NOT BE STRIPPED DURING UNDESIRABLE WORKING CONDITIONS (E.G. DURING WET WEATHER OR WHEN SOILS ARE SATURATED). TOPSOIL SHALL NOT BE STORED IN SWALES OR IN AREAS WITH POOR DRAINAGE.

SEEDING

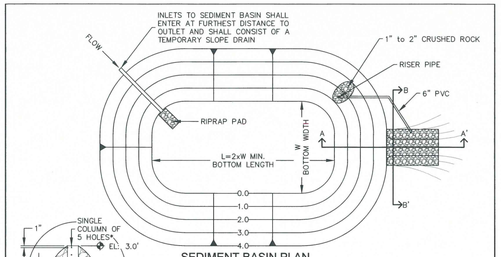
1. ALLOWABLE SEED MIXES ARE INCLUDED IN THE CITY OF COLORADO SPRINGS STORMWATER CONSTRUCTION MANUAL. ALTERNATIVE SEED MIXES ARE ACCEPTABLE IF INCLUDED IN AN APPROVED LANDSCAPING PLAN.
2. SEED SHOULD BE DRILL-SEEDED WHENEVER POSSIBLE
   - SEED DEPTH MUST BE ¼ TO ½ INCHES WHEN DRILL-SEEDING IS USED
3. BROADCAST SEEDING OR HYDRO-SEEDING WITH TACKIFIER MAY BE SUBSTITUTED ON SLOPES STEEPER THAN 3:1 OR ON OTHER AREAS NOT PRACTICAL TO DRILL SEED.
   - SEEDING RATES MUST BE DOUBLED FOR BROADCAST SEEDING OR INCREASED BY 50% IF USING A BRILLION DRILL OR HYDRO-SEEDING
   - BROADCAST SEEDING MUST BE LIGHTLY HAND-RAKED INTO THE SOIL

MULCHING

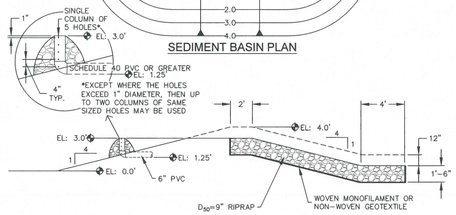
1. MULCHING SHOULD BE COMPLETED AS SOON AS PRACTICABLE AFTER SEEDING, HOWEVER PLANTED AREAS MUST BE MULCHED NO LATER THAN 14 DAYS AFTER PLANTING.
2. MULCHING REQUIREMENTS INCLUDE:
   - HAY OR STRAW MULCH
     - ONLY CERTIFIED WEED-FREE AND CERTIFIED SEED-FREE MULCH MAY BE USED. MULCH MUST BE APPLIED AT 2 TONS/ACRE AND ADEQUATELY SECURED BY CRIMPING AND/OR TACKIFIER.
     - CRIMPING MUST NOT BE USED ON SLOPES GREATER THAN 3:1 AND MULCH FIBERS MUST BE TUCKED INTO THE SOIL TO A DEPTH OF 3 TO 4 INCHES.
     - TACKIFIER MUST BE USED IN PLACE OF CRIMPING ON SLOPES STEEPER THAN 3:1.
   - HYDRAULIC MULCHING
     - HYDRAULIC MULCHING IS AN OPTION ON STEEP SLOPES OR WHERE ACCESS IS LIMITED.
     - IF HYDRO-SEEDING IS USED, MULCHING MUST BE APPLIED AS A SEPARATE, SECOND OPERATION.
     - WOOD CELLULOSE FIBERS MIXED WITH WATER MUST BE APPLIED AT A RATE OF 2,000 TO 2,500 POUNDS/ACRE, AND TACKIFIER MUST BE APPLIED AT A RATE OF 100 POUNDS/ACRE.
   - EROSION CONTROL BLANKET
     - EROSION CONTROL BLANKET MAY BE USED IN PLACE OF TRADITIONAL MULCHING METHODS.

SM

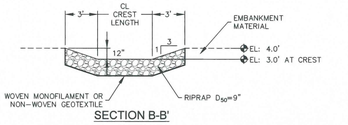
STORMWATER ENTERPRISE — SEEDING & MULCHING
APPROVED: SMENT MANAGER
ISSUED: 10/7/19 | REVISED: 8/19/2020 | DRAWING NO. 900-SM



SEDIMENT BASIN PLAN



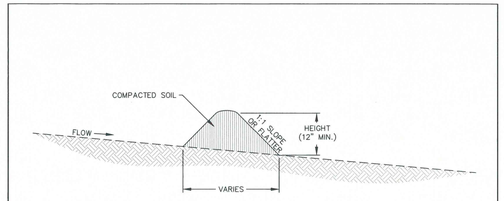
SECTION A-A'



SECTION B-B'

TSB

STORMWATER ENTERPRISE — TEMPORARY SEDIMENT BASIN
APPROVED: SMENT MANAGER
ISSUED: 10/7/19 | REVISED: 8/19/2020 | DRAWING NO. 900-TSB-1



TEMPORARY COMPACTED BERM

INSTALLATION NOTES

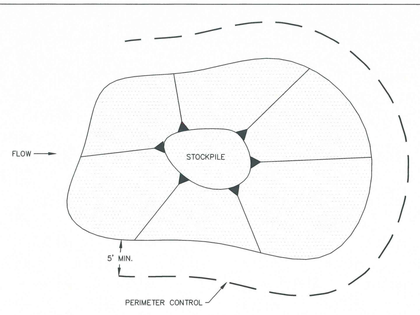
1. COMPACTED BERM MUST BE A MINIMUM HEIGHT OF ONE FOOT. BASE WIDTH IS DETERMINED BY HEIGHT.
2. COMPACTED BERMS MUST BE ADEQUATELY COMPACTED. NOT ALL SOILS ARE SUITABLE FOR COMPACTED BERMS.
3. INSTALL COMPACTED BERMS ALONG CONTOUR; DO NOT INSTALL PERPENDICULAR TO SLOPE.
4. THE MAXIMUM TRIBUTARY DRAINAGE AREA PER 100 LINEAR FEET OF COMPACTED BERMS SHALL BE ¼ ACRE.

MAINTENANCE NOTES

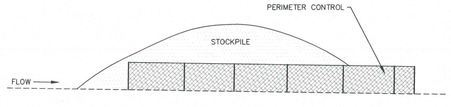
1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. ACCUMULATED SEDIMENT MUST BE REMOVED WHEN THE HEIGHT REACHES ½ OF THE DESIGN DEPTH OF THE BERM.

TCB

STORMWATER ENTERPRISE — TEMPORARY COMPACTED BERM
APPROVED: SMENT MANAGER
ISSUED: 10/7/19 | REVISED: 8/19/2020 | DRAWING NO. 900-TCB



STOCKPILE PROTECTION PLAN



STOCKPILE PROTECTION ELEVATION

INSTALLATION NOTES

1. INSTALL PERIMETER CONTROL AROUND STOCKPILE ON DOWNGRADIENT SIDE. PERIMETER CONTROL MUST BE SUITABLE TO SITE CONDITIONS AND INSTALLED ACCORDING TO THE RELEVANT DETAIL.
2. FOR STOCKPILES ON THE INTERIOR PORTION OF A CONSTRUCTION SITE, WHERE OTHER DOWNGRADIENT CONTROLS INCLUDING PERIMETER CONTROL ARE IN PLACE, STOCKPILE PERIMETER CONTROLS MAY NOT BE REQUIRED.

MAINTENANCE NOTES

1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. IF PERIMETER CONTROLS MUST BE MOVED TO ACCESS STOCKPILE, REPLACE PERIMETER CONTROLS BY THE END OF THE WORK DAY.
3. ACCUMULATED SEDIMENT MUST BE REMOVED ACCORDING TO PERIMETER CONTROL DETAIL.

SP

STORMWATER ENTERPRISE — STOCKPILE PROTECTION
APPROVED: SMENT MANAGER
ISSUED: 10/7/19 | REVISED: 8/19/2020 | DRAWING NO. 900-SP

TABLE SB-1, SIZING INFORMATION FOR STANDARD SEDIMENT BASIN

UPSTREAM DRAINAGE AREA (ROUNDED TO NEAREST ACRE), (AC)	BASIN BOTTOM WIDTH (W), (FT)	SPILLWAY CREST LENGTH (CL), (FT)	HOLE DIAMETER (HD), (IN)
1	12½	2	9/32
2	21	3	13/16
3	28	5	1/2
4	33½	6	9/16
5	38½	8	23/32
6	43	9	25/32
7	47¼	11	29/32
8	51	12	27/32
9	55	13	7/8
10	58½	15	15/16
11	61	16	29/32
12	64	18	1
13	67½	19	1 1/16
14	70½	21	1 1/8
15	73¼	22	1 3/16

INSTALLATION NOTES

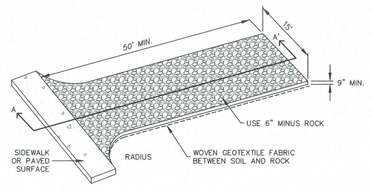
1. FOR STANDARD BASIN, BOTTOM DIMENSION MAY BE MODIFIED AS LONG AS BOTTOM AREA IS NOT REDUCED.
2. EMBANKMENT MATERIAL SHALL CONSIST OF SOIL FREE OF DEBRIS, ORGANIC MATERIAL, AND ROCKS OR CONCRETE GREATER THAN 3 INCHES, AND SHALL HAVE A MINIMUM OF 15 PERCENT BY WEIGHT PASSING THE No. 200 SIEVE.
3. EMBANKMENT MATERIAL SHALL BE COMPACTED TO AT LEAST 95 PERCENT OF MAXIMUM DENSITY IN ACCORDANCE WITH ASTM D-698.
4. PIPE SCHEDULE 40 OR GREATER SHALL BE USED.
5. THE DETAILS SHOWN ON THESE SHEETS PERTAIN TO STANDARD SEDIMENT BASIN(S) FOR DRAINAGE AREAS LESS THAN 15 ACRES. SEE CONSTRUCTION DRAWINGS FOR EMBANKMENT, STORAGE VOLUME, SPILLWAY, OUTLET, AND OUTLET PROTECTION DETAILS FOR ANY SEDIMENT BASIN(S) THAT HAVE BEEN INDIVIDUALLY DESIGNED FOR DRAINAGE AREAS LARGER THAN 15 ACRES. DESIGN CALCULATIONS MUST BE APPROVED PRIOR TO IMPLEMENTATION.

MAINTENANCE NOTES

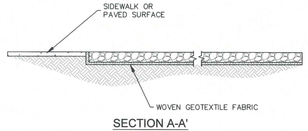
1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. SEDIMENT ACCUMULATED IN BASIN SHALL BE REMOVED AS NEEDED TO MAINTAIN CONTROL MEASURE EFFECTIVENESS, TYPICALLY WHEN SEDIMENT DEPTH REACHES ONE FOOT (I.E. TWO FEET BELOW SPILLWAY CREST).
3. SEDIMENT BASINS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS PERMANENTLY STABILIZED.
4. PERMANENTLY STABILIZE AREA AFTER SEDIMENT BASIN REMOVAL.

TSB

STORMWATER ENTERPRISE — TEMPORARY SEDIMENT BASIN
APPROVED: SMENT MANAGER
ISSUED: 10/7/19 | REVISED: 8/19/2020 | DRAWING NO. 900-TSB-2



AGGREGATE VEHICLE TRACKING CONTROL



SECTION A-A'

INSTALLATION NOTES

1. A STABILIZED CONSTRUCTION ENTRANCE/EXIT SHOULD BE LOCATED AT ALL POINTS WHERE VEHICLES EXIT THE CONSTRUCTION SITE TO ADJACENT ROADWAY.
2. STABILIZED CONSTRUCTION ENTRANCE/EXITS SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.
3. RADIUS MUST BE ADEQUATE FOR INTENDED CONSTRUCTION VEHICLE TURNING.
4. ROCK SHOULD CONSIST OF 6" MINUS ROCK.
5. INSTALL CONSTRUCTION FENCE ON BOTH SIDES OF VEHICLE TRACKING CONTROL PAD WHEN NEEDED OR REQUIRED BY INSPECTOR.

MAINTENANCE NOTES

1. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN CONTROL MEASURES IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
2. SEDIMENT TRACKED ONTO THE ADJACENT ROAD SHALL BE REMOVED DAILY, BY SWEEPING OR SHOVELING, AND NEVER WASHED DOWN STORM DRAINS.
3. ROUGHEN, REPLACE AND/OR ADD ROCK AS NEEDED TO MAINTAIN CONSISTENT DEPTH AND TO PREVENT SEDIMENT TRACKING ONTO ADJACENT STREET.
4. PERMANENTLY STABILIZE AREA AFTER VEHICLE TRACKING CONTROL IS REMOVED.

VTC

STORMWATER ENTERPRISE — VEHICLE TRACKING CONTROL
APPROVED: SMENT MANAGER
ISSUED: 10/7/19 | REVISED: 8/19/2020 | DRAWING NO. 900-VTC

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PREPARED UNDER THE DIRECT SUPERVISION OF
JERRY W. DAVIDSON, P.E.
COLORADO REG # 30226
FOR AND ON BEHALF OF
PERCEPTION DESIGN GROUP, INC.

DATE	DESCRIPTION	REVISIONS
02/03/25	1ST SUBMITTAL	

GEC DETAILS

CARUBIA PROPERTIES
LOT 2, BENT GRASS EAST COMMERCIAL FILING NO. 4
COUNTY OF EL PASO, COLORADO

Design By: CLN
Approved By: JWD
Project No.: 2024-019

SHEET
C5.92

Stormwater Inspection Report Template

Facility Name		Permittee	
Date of Inspection		Weather Conditions	
Permit Certification #		Disturbed Acreage	
Phase of Construction		Inspector Title	
Inspector Name			

	YES	NO
Is the above inspector a qualified stormwater manager? (permittee is responsible for ensuring that the inspector is a qualified stormwater manager)	☐	☐

INSPECTION FREQUENCY

Check the box that describes the minimum inspection frequency utilized when conducting each inspection

At least one inspection every 7 calendar days	☐
At least one inspection every 14 calendar days, with post-storm event inspections conducted within 24 hours after the end of any precipitation or snowmelt event that causes surface erosions	☐
● This is a post-storm event inspection. Event Date: _____	☐
Reduced inspection frequency - Include site conditions that warrant reduced inspection frequency	☐
● Post-storm inspections at temporarily idle sites	☐
● Inspections at completed sites/area	☐
● Winter conditions exclusion	☐

	YES	NO
Have there been any deviations from the minimum inspection schedule? If yes, describe below.	☐	☐

INSPECTION REQUIREMENTS*

i. Visually verify whether all implemented control measures are in effective operational condition and are working as designed in the specifications to minimize pollutant discharges

   a. Assess the adequacy of control measures for pumped stormwater (e.g. sediment plume, suspended solids, unusual color, decreased clarity, presence of odor or foam, etc).

ii. Determine if there are new potential sources of pollutants

iii. Assess the adequacy of control measures at the site to identify areas requiring new or modified control measures to minimize pollutant discharges

iv. Identify all areas of non-compliance with the permit requirements, and if necessary, implement corrective action(s) in accordance with Part I.B.1.c.

*Use the attached **Control Measures Requiring Routine Maintenance** and **Inadequate Control Measures Requiring Corrective Action** forms to document results of this assessment that trigger either maintenance or corrective actions

AREAS TO BE INSPECTED

Is there evidence of, or the potential for, pollutants leaving the construction site boundaries, entering the stormwater drainage system or discharging to state waters at the following locations?

	NO	YES	If "YES" describe discharge or potential for discharge below. Document related maintenance, inadequate control measures and corrective actions **Inadequate Control Measures Requiring Corrective Action** form
Construction site perimeter	☐	☐	
All disturbed areas, including areas that are temporarily stabilized	☐	☐	
Designated haul routes	☐	☐	
Material and waste storage areas exposed to precipitation	☐	☐	
Locations of pumped stormwater	☐	☐	

Locations where stormwater has the potential to discharge offsite, including visible erosion and sedimentation	☐	☐	
Locations where vehicles exit the site	☐	☐	
Locations of installed control measures	☐	☐	

CONTROL MEASURES REQUIRING ROUTINE MAINTENANCE

Definition: Any control measure that is still operating in accordance with its design and the requirements of the permit, but requires maintenance to prevent a breach of the control measure. These items are not subject to the corrective action requirements as specified in Part I.B.1.c of the permit.

Are there control measures requiring routine maintenance?	NO	YES	
	☐	☐	If "YES" document below

Date Observed	Location	Control Measure	Routine Maintenance Required	Date Completed

INADEQUATE CONTROL MEASURES REQUIRING CORRECTIVE ACTION

Definition: Any control measure that is not designed or implemented in accordance with the requirements of the permit and/or any control measure that is not implemented to operate in accordance with its design. This includes control measures that have not been implemented for pollutant sources. If it is infeasible to install or repair the control measure immediately after discovering the deficiency the reason must be documented and a schedule included to return the control measure to effective operating condition as possible.

	NO	YES	
Are there inadequate control measures requiring corrective action?	☐	☐	If "YES" document below

	NO	YES	
Are there additional control measures needed that were not in place at the time of inspection?	☐	☐	If "YES" document below

Date Discovered	Location	Description of Inadequate Control Measure	Description of Corrective Action	Was deficiency corrected when discovered? YES/NO if "NO" provide reason and schedule to correct	Date Corrected

INADEQUATE CONTROL MEASURES REQUIRING CORRECTIVE ACTION

Definition: Any control measure that is not designed or implemented in accordance with the requirements of the permit and/or any control measure that is not implemented to operate in accordance with its design. This includes control measures that have not been implemented for pollutant sources. If it is infeasible to install or repair the control measure immediately after discovering the deficiency the reason must be documented and a schedule included to return the control measure to effective operating condition as possible.

REPORTING REQUIREMENTS

The permittee shall report the following circumstances on the division's submission form within twenty-four (24) hours from the time the permittee becomes aware of the circumstances, and shall submit to the division a written report containing the information requested within five (5) working days after becoming aware of the following circumstances.

All Noncompliance Requiring 24-Hour Notification per Part II.L.7 of the Permit

a. Endangerment to Health or the Environment

Circumstances leading to any noncompliance which may endanger health or the environment regardless of the cause of the incident (See Part II.L.7.a.i of the Permit)

This category would primarily result from the discharge of pollutants in violation of the permit

b. Numeric Effluent Limit Violations

- Circumstances leading to any unanticipated bypass which exceeds any effluent limitations (See Part II.L.6.a.ii of the Permit)
- Circumstances leading to any upset which causes an exceedance of any effluent limitation (See Part II.L.6.a.iii of the Permit)
- Daily maximum violations (See Part II.L.6.a.iv of the Permit)

Numeric effluent limits are very uncommon in certifications under the COR400000 general permit. This category of noncompliance only applies if numeric effluent limits are included in a permit certification.

	NO	YES	
Has there been an incident of noncompliance requiring 24-hour notification?	☐	☐	If "YES" document below

Date and Time of Incident	Location	Description of Noncompliance	Description of Corrective Action	Date and Time of 24 Hour Notification	Date of 5 Day Written Notification *

*Attach copy of 5 day written notification to report. Indicate if written notification was waived, including the name of the division personnel who granted waiver.

"I verify that, to the best of my knowledge and belief, that if any corrective action items were identified during the inspection, those corrective actions are complete, and the site is currently in compliance with the permit"

_____ _____

Name of Qualified Stormwater Manager Title of Qualified Stormwater Manager

_____ _____

Signature of Qualified Stormwater Manager Date

Notes/Comments

Standard Operation Procedures
for
Inspection and Maintenance

Sand Filter Basins
(SFBs)

June 2016

Updated 7/2024

Table of Contents

SFB-1 Background

Sand Filter Basins (SFBs) are a common type of Stormwater Management facility utilized within the Front Range of Colorado. A SFB consists of a sedimentation chamber, a flat surfaced area of sand (sometimes covered with grass or sod), a filtration chamber, and a flat sand filter bed with an underdrain system. A surcharge zone exists within the sedimentation and filtration chambers for temporary storage of the Water Quality Capture Volume (WQCV). During a storm, runoff enters the sedimentation chamber, where the majority of sediments are deposited. The runoff then enters the filtration chamber where it ponds above the sand bed and gradually infiltrates into the underlying sand filter, filling the void spaces of the sand. The underdrain gradually dewaters the sand bed and discharges the runoff to a nearby channel, swale, or storm sewer. SFBs provide for filtering and absorption of pollutants in the stormwater[3]. The popularity of SFBs has grown because they allow the WQCV to be provided on a site that has little open area available for stormwater management. However, there are limitations on their use due to potential clogging from large amounts of sediment.

SFB-2 Inspecting Sand Filter Basins (SFBs)

SFB-2.1 Access and Easements

Inspection and maintenance personnel may utilize the stormwater facility map located in Appendix G containing the locations of the access points and maintenance easements of the SFBs within this development.

SFB-2.2 Stormwater Management Facilities Locations

Inspection and maintenance personnel may utilize the stormwater facility map located in Appendix G containing the locations of the SFBs within this development.

SFB-2.3 Sand Filter Extended Detention Basin (SFB) Features

SFBs have a number of features designed to serve a particular function. Many times the proper function of one feature depends on another. It is important for maintenance personnel to understand the function of each of these features to prevent damage to any feature during maintenance operations. Below is a basic list and description of the most common features within a SFB and the corresponding maintenance inspection items that may be anticipated:

[3] Design of Stormwater Filtering Systems, Centers for Watershed Protection, December 1996

Table SFB-1
Typical Inspection & Maintenance Requirements Matrix

	Sediment Removal	Mowing Weed control	Trash/ Debris Removal	Erosion	Overgrown Vegetation Removal	Removal/ Replacement	Structure Repair
Inflow Points/Splitter Box	X		X				X
Sedimentation Chamber	X	X	X	X	X		
Filter Media	X	X	X	X	X	X	
Underdrain System						X	
Overflow Outlet Works	X		X				X
Embankment		X	X	X	X		

SFB-2.3.1 Inflow Points/Splitter Box

Inflow points or outfalls into SFBs are the point of stormwater discharge into the facility. An inflow point is commonly a curb cut with a concrete or riprap rundown or a storm sewer pipe outfall with a flared end section.

In some instances SFBs are designed to treat only the WQCV. The WQCV is a volume of water that runs off a site during an 80th percentile event. Any amount over the WQCV is allowed to go to a detention facility without water quality treatment. The splitter box is generally constructed of reinforced concrete. The splitter box typically has a lower wall height that will trap the required WQCV. Volumes over the WQCV are allowed to spill over the wall and enter a storm sewer system that conveys the runoff to a detention facility. Proper inspection and maintenance of the splitter box is essential in ensuring the long-term operation of the SFB.

An energy dissipater is typically immediately downstream of the splitter box, at the discharge point into the SFB, to protect the sedimentation and filtration chambers from erosion. In some cases, the splitter box outfall can have a toe-wall or cut-off wall immediately below the structure to prevent undercutting of the outfall from erosion.

Where there is detention included with the SFB an energy dissipater (riprap or hard armor protection) is typically immediately downstream of the discharge point into the SFB to protect from erosion. In some cases, the storm sewer outfall can have a toe-wall or cut-off wall immediately below the structure to prevent undercutting of the outfall from erosion.

The typical maintenance activities required at inflow points are as follows:

a. *Riprap Displaced* – Many times, because of the repeated impact/force of water, riprap can shift and settle. If any portion of the riprap apron appears to have settled, soil is present between the riprap, or the riprap has shifted,

maintenance may be required to ensure future erosion is prevented.

b. *Sediment Accumulation* – Because of the turbulence in the water created by the energy dissipater, sediment often deposits immediately downstream of the inflow point. To prevent a loss in performance of the upstream infrastructure, sediment that accumulates in this area must be removed on a timely basis.

c. *Structural Damage* – Structural damage can occur at any time during the life of the facility. Typically for an inflow, the structural damage occurs to the pipe flared end section (concrete or steel). Structural damage can lead to additional operating problems with the facility, including loss of hydraulic performance.

SFB-2.3.2 Sedimentation Chamber (Forebay)

The sedimentation chamber is located adjacent to the splitter box (inflow point) and generally consists of a flat irrigated turf grass area followed by a water trapping device allowing water to be briefly held in the sedimentation chamber before being released into the filtration chamber. This slowing of the runoff allows sediments/trash to be deposited in the sedimentation chamber (forebay) and not the filtration chamber where they can cause clogging of the filter media.

The typical maintenance activities required within the sedimentation chamber are as follows:

a. Mowing/woody growth control/weeds present - Routine mowing of the turf grass within the sediment chamber is necessary to improve the overall appearance and to ensure proper function of the SFB. Turf grass should be mowed to a height of two (2) to four (4) inches and shall be bagged to prevent potential contamination of the filter media. Before mowing any trash/debris should be removed and properly disposed. If undesirable vegetation is not routinely mowed/removed, the growth can cause debris/sediment to accumulate, resulting in blockage of the filter media. Also, shrub, grass and weed roots can cause damage to the filter media and underdrain system. Routine management is essential to prevent more extensive and costly future maintenance.

SBF-2.3.3 Filter Media

The filter media is the main pollutant removal component of the SFB. The filter media consists of eighteen (18) inches of washed sand. The filter media removes pollutants through several different processes, including sedimentation, filtration, infiltration and microbial uptake.

Sedimentation is accomplished by the slow release of stormwater runoff through the filter media. This slow release allows for sediment particles that were not deposited in the sedimentation chamber to be deposited on the top layer of the filter media where they are easily removed through routine maintenance. Other pollutants are also removed through this process because they are attached to sediment.

Filtration is the main pollutant removal mechanism of SFBs. When the stormwater runoff migrates down through the filter media, many of the particulate pollutants are physically strained out as they pass through the filter bed of sand and are trapped on the surface or among the pores of the filter media.

SFBs not lined with an impervious liner allow for infiltration into the native soils. This process also allows for additional pollutant removal.

Microbes that naturally occur in the filter media can assist with pollutant removal by breaking down organic pollutants.

The typical maintenance activities required within the filter media areas are as follows:

a. *Mowing/woody growth control/weeds present* - Noxious weeds and other unwanted vegetation must be treated as needed throughout the SFB. This activity can be performed either through mechanical means (mowing/pulling) or with herbicide. Consultation with a local Weed Inspector is highly recommended prior to the use of herbicide. Herbicides should be utilized sparingly and as a last resort. All herbicide applications should be in accordance with the manufacturer's recommendations.

b. *Sediment/Pollutant Removal* – Although SFBs should not be utilized in areas where large concentrations of sediment and other pollutants will enter the SFB, it is inevitable some sediment and other pollutants will enter the SFB. Most sediment will be deposited in the sedimentation chamber (forebay), however finer suspended particles will migrate to the filter media. These sediments need to be removed to ensure proper infiltration rates of the stormwater runoff.

c. *Filter Replacement* - The top layers of the filter media are the most susceptible to pollutant loading and therefore may need to be removed and disposed of properly on a semi-regular basis when infiltration rates slow.

d. *Infiltration Rate Test* - An infiltration test may be necessary to ensure proper

functioning of the filter media. The infiltration test can be conducted by filling the sand filter with water to the design elevation shown on the design drawings. The sand filter needs to drain completely within twenty-four (24) hours of the filling. If the drain time for the basin is longer than twenty-four (24) hours, the filter is in need of maintenance.

SFB-2.3.4 Underdrain System

The underdrain system consists of a layer of geotextile fabric, gravel storage area and perforated PVC pipes. The geotextile fabric is utilized to prevent the filter media from entering the underdrain system. The gravel storage area allows for storage of treated stormwater runoff prior to the discharge of the runoff through the perforated PVC pipe.

The typical maintenance activities required for the underdrain system are as follows:

With proper maintenance of the filter media and sediment chamber, there should be a minimum amount of maintenance required on the underdrain system. Generally, the only maintenance performed on the underdrain system is jet-vac cleaning.

SFB-2.3.5 Outlet Works

Where SFBs do not have a detention component the outlet works may take the place of the splitter box. If this is the case the outlet works includes an overflow. The overflow outlet works allows runoff amounts exceeding the WQCV to exit the SFB to the detention facility.

When the SFB does have a detention component the outlet works is typically constructed of reinforced concrete into the embankment of the SFB. The concrete structure typically has steel orifice plates anchored/embedded into it to control stormwater release rates. The larger openings (flood control) on the outlet structure typically have trash racks over them to prevent clogging. Proper inspection and maintenance of the outlet works is essential in ensuring the long-term operation of the SFB.

The typical maintenance activities required for the overflow outlet works are as follows:

a. *Trash Rack/Well Screen Clogged in an SFB with Detention Component* - Floatable material entering the SFB will most likely make its way to the outlet structure. This material is trapped against the trash racks and well screens on the outlet structure (which is why they are there). This material must be removed on a routine basis to ensure the outlet structure drains in the specified design period.

b. *Structural Damage* - The overflow outlet structure is primarily constructed of concrete, which can crack, spall, and settle. The steel grate on the overflow outlet structure (is so equipped), steel trash racks and well screens (if so equipped) are also susceptible to damage.

c. *Orifice Plate Missing/Not Secure in an SFB with Detention Component* - Many times residents, property owners, or maintenance personnel will remove or loosen orifice plates if they believe the pond is not draining properly. Any modification to the orifice plate(s) will significantly affect the designed discharge rates for flood control. Modification of the orifice plates is not allowed without approval from the City of Aurora Public Works Department, Engineering Control Division.

d. *Mowing/woody growth control/weeds present* – SFBs without the detention component the presence of plant material not part of the original landscaping, such as wetland plants or other woody growth, can clog the overflow outlet works during a larger storm event, causing flooding damage to adjacent areas. This plant material may indicate a clogging of the filter media and may require additional investigation.

In SFBs with the detention component woody vegetation not routinely mowed/removed may cause additional sediment/debris to accumulate around the outlet works. Any tree roots present can cause damage to the structural components of the outlet works. Routine management is essential for trees (removing a small tree/sapling is much cheaper and "quieter" than a mature tree).

SFB-2.3.6 Embankments

Some SFBs utilize irrigated turf grass embankments to store the required volume.

The typical maintenance activities required for the embankments areas are as follows:

a. Vegetation Sparse – The embankments are one of the most visible parts of the SFB and, therefore, aesthetics is important. Adequate and properly maintained vegetation can greatly increase the overall appearance of the SFB. Also, vegetation can reduce the potential for erosion and subsequent sediment transport to the filter media, thereby reducing the need for more costly maintenance.

b. Erosion – Inadequate vegetative cover may result in erosion of the embankments. Erosion that occurs on the embankments can cause clogging of the filter media.

c. Trash/Debris – Trash and debris can accumulate in the upper area after large events, or from illegal dumping. Over time, this material can clog the SFB filter media and outlet works.

d. Mowing/woody growth control/weeds present – The presence of plant material not part of the original landscaping, such as wetland plants or other woody growth, can result in difficulty in performing maintenance activities. These trees and shrubs may also damage the underdrain system of the SFB. This plant material may indicate a clogging of the filter media and may require additional investigation.

SFB-2.3.7 Emergency Overflow

An emergency spillway is typical of all SFBs and designed to serve as the overflow in the event the volume of the pond is exceeded. The emergency spillway is typically armored with riprap (or other hard armor), and is sometimes buried with soil or may be a concrete wall or other structure. The emergency spillway is typically a weir (notch) in the basin embankment. Proper function of the emergency spillway is essential to ensure flooding does not affect adjacent properties.

The typical maintenance activities required for the emergency overflow areas are as follows:

a. *Riprap Displaced* – As mentioned before, the emergency spillway is typically armored with riprap to provide erosion protection. Over the life of an SFB, the riprap may shift or become dislodged due to flow.

b. *Erosion Present* – Although the spillway is typically armored, stormwater flowing through the spillway can cause erosion damage. Erosion must be repaired to ensure the integrity of the basin embankment, and proper function of the spillway.

c. *Mowing/weed/woody growth control* – Management of woody vegetation is essential in the proper long-term function of the spillway. Larger trees or dense shrubs can capture larger debris entering the SFB and reduce the capacity of the spillway. These trees and shrubs may also damage the underdrain system of the SFB.

d. *Obstruction/Debris* – The spillway must be cleared of any obstruction (man-made or natural) to ensure the proper design capacity.

SFB-2.3.8 Miscellaneous

There are a variety of inspection/maintenance issues that may not be attributed to a single feature within the SFB. This category on the inspection form is for maintenance items commonly found in the SFB, but may not be attributed to an individual feature.

a. *Encroachment in Easement Area* – Private lots/property can sometimes be located very close to the SFBs, even though they are required to be located in tracts with drainage easements. Property owners may not place landscaping, trash, fencing, or other items within the easement area that may adversely affect maintenance or the operation of the facility.

b. *Graffiti/Vandalism* – Vandals can cause damage to the SFB infrastructure. If criminal mischief is evident, the inspector should forward this information to the Aurora Police Department.

c. *Public Hazards* – Public hazards include items such as vertical drops of greater than four (4) feet, containers of unknown/suspicious substances, and exposed metal/jagged concrete on structures. **If any unknown/suspicious hazard is**

found within the facility area that poses an immediate threat to public safety, call 911 immediately.

d. Other – Any miscellaneous inspection/maintenance items not contained on the form should be entered here.

SFB-2.4 Inspection Forms

SFB Inspection forms are located in Appendix D. Inspection forms shall be completed by the person(s) conducting the inspection activities. Each form shall be reviewed and submitted by the property owner or property manager to the City of Aurora per the requirements of the Inspection and Maintenance Plan. These inspection forms shall be kept indefinitely and made available to the City of Aurora upon request.

SFB-3 Maintaining Sand Filters Basins (SFBs)

SFB-3.1 Maintenance Personnel

Maintenance personnel must be qualified to properly maintain SFBs. Inadequately trained personnel can cause additional problems resulting in additional maintenance costs.

SFB-3.2 Equipment

It is imperative that the appropriate equipment and tools are taken to the field with the operations crew. The types of equipment/tools will vary depending on the task at hand. Below is a basic list of tools, equipment, and material(s) that may be necessary to perform maintenance on a SFB:

1.) Mowing Tractors
2.) Trimmers (extra string)
3.) Shovels
4.) Rakes
5.) All Surface Vehicle (ASVs)
6.) Skid Steer
7.) Back Hoe
8.) Track Hoe/Long Reach Excavator
9.) Dump Truck
10.) Jet-Vac Machine
11.) Engineers Level (laser)
12.) Riprap (Minimum - Type M)
13.) Geotextile Fabric
14.) Erosion Control Blanket(s)
15.) Sod

16.) Illicit Discharge Cleanup Kits

17.) Trash Bags

18.) Tools (wrenches, screw drivers, hammers, etc)

19.) Confined Space Entry Equipment

20.) Approved Stormwater Facility Inspection and Maintenance Plan

21.) ASTM C-33 Sand

Some of the items identified above may not be needed for every maintenance operation. However, this equipment and material should be available to the maintenance operations crews should the need arise.

SFB-3.3 Safety

Vertical drops may be encountered in areas located within and around the SFB. Avoid walking on top of retaining walls or other structures having a significant vertical drop. If a vertical drop within the pond is identified as greater than forty-eight (48) inches in height, make the appropriate note/comment on the maintenance inspection form.

SFB-3.4 SFB Maintenance Forms

The SFB Maintenance Form provides a record of each maintenance operation performed by maintenance contractors. The SFB Maintenance Form shall be filled out in the field after the completion of the maintenance operation. Each form shall be reviewed and submitted by the property owner or property manager to the City of Aurora per the requirements of the Inspection and Maintenance Plan. The SFB Maintenance form is located in Appendix E.

SFB-3.5 SFB Maintenance Categories and Activities

A typical SFB Maintenance Program will consist of three broad categories of work: Routine, Minor and Major. Within each category of work, a variety of maintenance activities can be performed on a SFB. A maintenance activity can be specific to each feature within the SFB, or general to the overall facility. This section of the SOP explains each of the categories and briefly describes the typical maintenance activities for a SFB.

A variety of maintenance activities are typical of SFBs. The maintenance activities range in magnitude from routine trash pickup to the reconstruction of the SFB filter media or underdrain system. Below is a description of each maintenance activity, the objectives, and frequency of actions.

SFB-3.6 Routine Maintenance Activities

The majority of this work consists of scheduled mowings, trash and debris pickups for the SFB during the growing season. It also includes activities such as weed control. These activities normally will be performed numerous times during the year. These items typically do not require any prior correspondence with the City of Aurora, however, completed inspection and maintenance forms shall be submitted to the City of Aurora for each inspection and maintenance in accordance with the Inspection and Maintenance Plan.

The Routine Maintenance Activities are summarized below, and further described in the following sections.

Table SFB-2
Summary of Routine Maintenance Activities

Maintenance Activity	Minimum Frequency	Look for:	Maintenance Action
Mowing	Twice annually	Excessive grass height/aesthetics	2”-4” grass height
Trash/Debris Removal	Twice annually	Trash/debris in SFB	Remove and dispose of trash and debris
Splitter Box/Overflow Outlet Works Cleaning	As needed - after significant rain events – twice annually minimum	Clogged outlet structure; ponding water	Remove and dispose of debris/trash/sediment to allow outlet to function properly
Woody growth control /Weed removal	Minimum twice annually	Noxious weeds; Unwanted vegetation	Treat w/herbicide or hand pull; consult a local Weed Inspector

SFB-3.6.1 Mowing

Routine mowing of the turf grass embankments and turf grass located in the sedimentation chamber (forebay) and embankment is necessary to improve the overall appearance of the SFB, and to ensure proper performance of the sediment chamber. Turf grass should be mowed to a height of two (2) to four (4) inches, and shall be bagged to prevent potential contamination of the filter media.

Frequency – Routine - Minimum of twice annually or depending on aesthetics.

SFB-3.6.2 Trash/Debris Removal

Trash and debris must be removed from the entire SFB area to minimize outlet clogging and to improve aesthetics. This activity must be performed prior to mowing operations.

Frequency – Routine – Prior to mowing operations and minimum of twice annually.

SFB-3.6.3 Splitter Box/ Outlet Works Cleaning

Debris and other materials can clog the splitter box/outlet work’s grate or orifice plate(s) and trash rack. This activity must be performed anytime other maintenance activities are conducted to ensure proper operation.

Frequency - Routine – After significant rainfall event or concurrently with other maintenance activities.

SFB- 3.6.4 Woody Growth Control/Weed Removal

Noxious weeds and other unwanted vegetation must be treated as needed throughout the SFB. This activity can be performed either through mechanical means (mowing/pulling) or with herbicide. Consultation with a local Weed Inspector is highly recommended prior to the use of herbicide. Herbicides should be utilized sparingly and as a last resort. All herbicide applications should be in accordance with the manufacturer's recommendations.

Frequency – Routine – As needed based on inspections.

SFB-3.7 Minor Maintenance Activities

This work consists of a variety of isolated or small-scale maintenance/operational problems. Most of this work can be completed by a small crew, hand tools, and small equipment. These items require prior approval from the City of Aurora Water Staff. Completed inspection and maintenance forms shall be submitted to the City of Aurora Water Staff for each inspection and maintenance period. In the event the SFB needs to be dewatered, care should be given to ensure sediment, filter material and other pollutants are not discharged. All dewatering activities shall be coordinated with the City of Aurora Water Staff.

TABLE SFB-3
Summary of Minor Maintenance Activities

Maintenance Activity	Minimum Frequency	Look for:	Maintenance Action
Sediment/Pollutant Removal	As needed; typically every 1 –2 years	Sediment build-up in sedimentation chamber and filter media; decrease in infiltration rate	Remove and dispose of sediment
Erosion Repair	As needed, based upon inspection	Rills/gullies on embankments or sedimentation in the forebay	Repair eroded areas & revegetate; address cause
Jet-Vac/Cleaning Underdrains	As needed, based upon inspection	Sediment build-up /non-draining system	Clean drains; Jet-Vac if needed

SFB-3.7.1 Sediment Removal/Pollutant Removal

Sediment removal is necessary to ensure proper function of the filter media. The infiltration rate of the SFB needs to be checked in order to ensure proper functioning of the SFB. Generally, a SFB should drain completely within twenty-four (24) hours of a storm event. If drain times exceed the twenty-four (24) hour drain time then maintenance of the filter media shall be required.

At a minimum, the top three (3) inches of filter media should be removed at each removal period. Additional amounts of filter media may need to be removed if deeper sections of the filter media are contaminated. New filter media will need to be placed

back into the SFB when the total amount of sand removed reaches nine (9) inches. This may take multiple maintenance events to accomplish. It is critical only sand meeting the American Society for Testing and Materials (ASTM) C-33 standard be utilized in the replacement of the filter media. (Note: The update to the UDFCD's Volume III manual, to be released in late 2010, may have new filter media guidelines).

ASTM C-33 Sand Standard

US Standard Sieve Size (Number)	Total Percent Passing (%)
9.5 mm (3/8 inch)	100
4.75 mm (No. 4)	95-100
2.36 mm (No. 8)	80-100
1.18 mm (No. 16)	50-85
600□0085mm (No	25-60
300□0060mm (No	10-30
150□5030mm (No.	2-10

Other types of sand and soil material may lead to clogging of the SFB. (Note: The update to the UDFCD's Volume III manual, to be released in late 2010, may have new filter media guidelines). The minor sediment removal activities can typically be addressed with shovels, rakes and smaller equipment.

Stormwater sediments removed from SFBs do not meet the regulatory definition of "hazardous waste". However, these sediments can be contaminated with a wide array of organic and inorganic pollutants and handling must be done with care to ensure proper removal and disposal. Sediments should be transported by motor vehicle only after they are dewatered. All sediments must be taken to a licensed landfill for proper disposal. Should a spill occur during transportation, prompt and thorough cleanup and disposal is imperative.

Frequency – Non-routine – As necessary, based upon inspections. Sediment removal in the sedimentation chamber (forebay) may be necessary as frequently as every one (1) to two (2) years.

SFB-3.7.2 Erosion Repair

The repair of eroded areas is necessary to ensure the proper functioning of the SFB, to minimize sediment transport, and to reduce potential impacts to other features. Erosion can vary in magnitude from minor repairs to filter media and embankments, to rills, and gullies in the embankments and inflow points. The repair of eroded areas may require the use of excavators, earthmoving equipment, riprap, concrete, and sod. Extreme care should be taken when utilizing motorized or heavy equipment to ensure damage to the underdrain system does not occur. Major erosion repair to the pond embankments, spillways, and adjacent to structures will require consultation with the City of Aurora Water and Engineering Staff.

Frequency – Non-routine – As necessary, based upon inspections.

SFB-3.7.3 Jet-Vac/Clearing Drains

A SFB contains an underdrain system that allows treated stormwater runoff to exit the facility. These underdrain systems can develop blockages that can result in a decrease of hydraulic capacity and also create standing water. Many times the blockage to this infrastructure can be difficult to access and/or clean. Specialized equipment (jet-vac machines) may be necessary to clear debris from these difficult areas.

Frequency – Non-routine – As necessary, based upon inspections.

SFB-3.8 Major Maintenance Activities

This work consists of larger maintenance/operational problems and failures within the stormwater management facilities. All of this work requires approval from the City of Aurora to ensure the proper maintenance is performed. This work requires the City of Aurora Water Staff review the original design and construction drawings to assess the situation before approval of the proposed maintenance activities. This work may also require more specialized maintenance equipment, design/details, submittal of plans to the City of Aurora for review and approval, surveying, or assistance through private contractors and consultants. In the event the facility needs to be dewatered, care should be given to ensure sediment, filter material and other pollutants are not discharged. Consultation with the City of Aurora Water Staff is required prior to any dewatering activity.

Table SFB-4
Summary of Major Maintenance Activities

Maintenance Activity	Minimum Frequency	Look for:	Maintenance Action
Major Sediment/Pollutant Removal	As needed – based upon scheduled inspections	Large quantities of sediment in the sedimentation chamber (forebay) and/or filter media; reduced infiltration rate /capacity	Remove and dispose of sediment. Repair vegetation as needed
Major Erosion Repair	As needed – based upon scheduled inspections	Severe erosion including gullies, excessive soil displacement, areas of settlement, holes	Repair erosion – find cause of problem and address to avoid future erosion
Structural Repair	As needed – based upon scheduled inspections	Deterioration and/or damage to structural components – broken concrete, damaged pipes & outlet works	Structural repair to restore the structure to its original design
SFB Rebuild	As needed – due to complete failure of SFB	Removal of filter media and underdrain system	Contact the City of Aurora Water and Engineering Staff

SFB-3.8.1 Major Sediment/Pollutant Removal

In very rare cases the filter media of the SFB may be so badly contaminated the entire eighteen (18) inches of the filter media may need to be removed.

Major sediment/pollutant removal consists of removal of large quantities of sediment/filter media. Major sediment removal activities will require larger and more specialized equipment. Extreme care should be taken when utilizing motorized or heavy equipment to ensure damage to the underdrain system does not occur. The sediment/filter media needs to be carefully removed, transported and properly disposed. Vegetated areas need special care to ensure design volumes and grades are preserved or may need to be replaced due to the removal activities. The major sediment removal activities will require surveying with an engineer's level, and consultation with the City of Aurora Water and Engineering Staff to ensure design volumes/grades are achieved. Stormwater sediments removed from SFBs do not meet the regulatory definition of "hazardous waste". However, these sediments can be contaminated with a wide array of organic and inorganic pollutants and handling must be done with care to insure proper removal and disposal. Sediments should be transported by motor vehicle only after they are dewatered. All sediments must be taken to a licensed landfill for proper disposal. Should a spill occur during transportation, prompt and thorough cleanup and disposal is imperative.

Frequency – Non-routine – Repair as needed, based upon inspections.

SFB-3.8.2 Major Erosion Repair

Major erosion repair consists of filling and revegetating areas of severe erosion. Determining the cause of the erosion as well as correcting the condition that caused the erosion should also be part of the erosion repair. Care should be given to ensure design grades and volumes are preserved. Consult with the City of Aurora Water and Engineering Staff. Extreme care should be taken when utilizing motorized or heavy equipment to ensure damage to the underdrain system does not occur.

Frequency – Non-routine – Repair as needed, based upon inspections.

SFB-3.8.3 Structural Repair

A SFB generally includes a splitter box (if no detention component) or concrete outlet structure that can deteriorate or be damaged during the service life of the facility. These structures are constructed of steel and concrete that can degrade or be damaged and may need to be repaired or re-constructed from time to time. Major repairs to structures may require input from a structural engineer and specialized contractors. Consultation with the City of Aurora Water and Engineering Staff shall take place prior to all structural repairs.

Frequency – Non-routine – Repair as needed, based upon inspections.

SFB-3.8.4 SFB Rebuild

In very rare cases a SFB may need to be rebuilt. Generally, the need for a complete rebuild is a result of improper construction, improper maintenance resulting in structural damage to the underdrain system, or extensive contamination of the SFB. Consultation with the City of Aurora Water and Engineering Staff shall take place prior to any rebuild project.

Frequency – Non-routine – As needed, based upon inspections.

Reference:

This plan is adapted from Southeast Metro Stormwater Authority, *Operation and Maintenance (O & M) Manual,* **and the Douglas County, Colorado,** *Standard Operating Procedure for Extended Detention Basin (EDB) Inspection and Maintenance,* July 2005

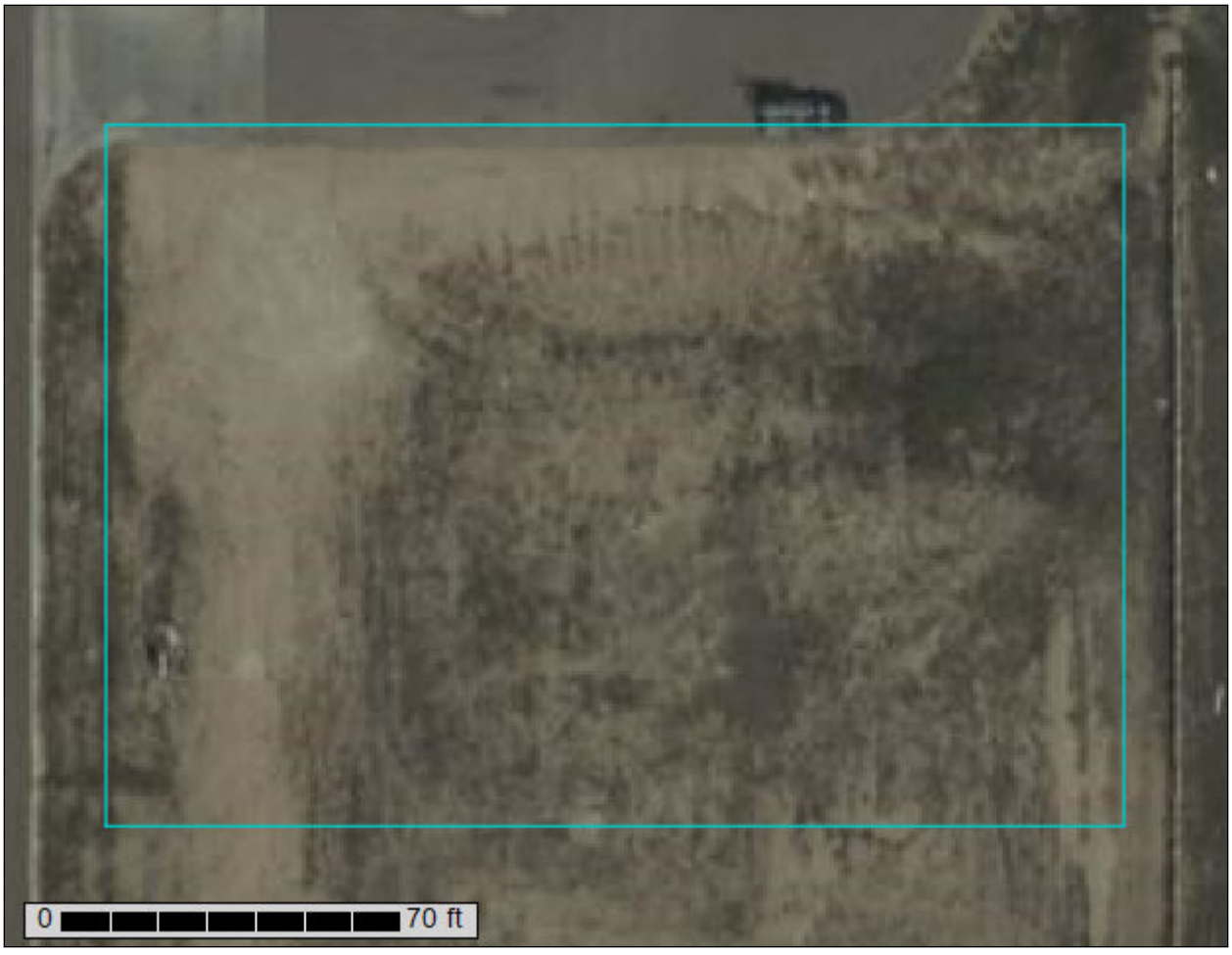
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for El Paso County Area, Colorado



December 13, 2024

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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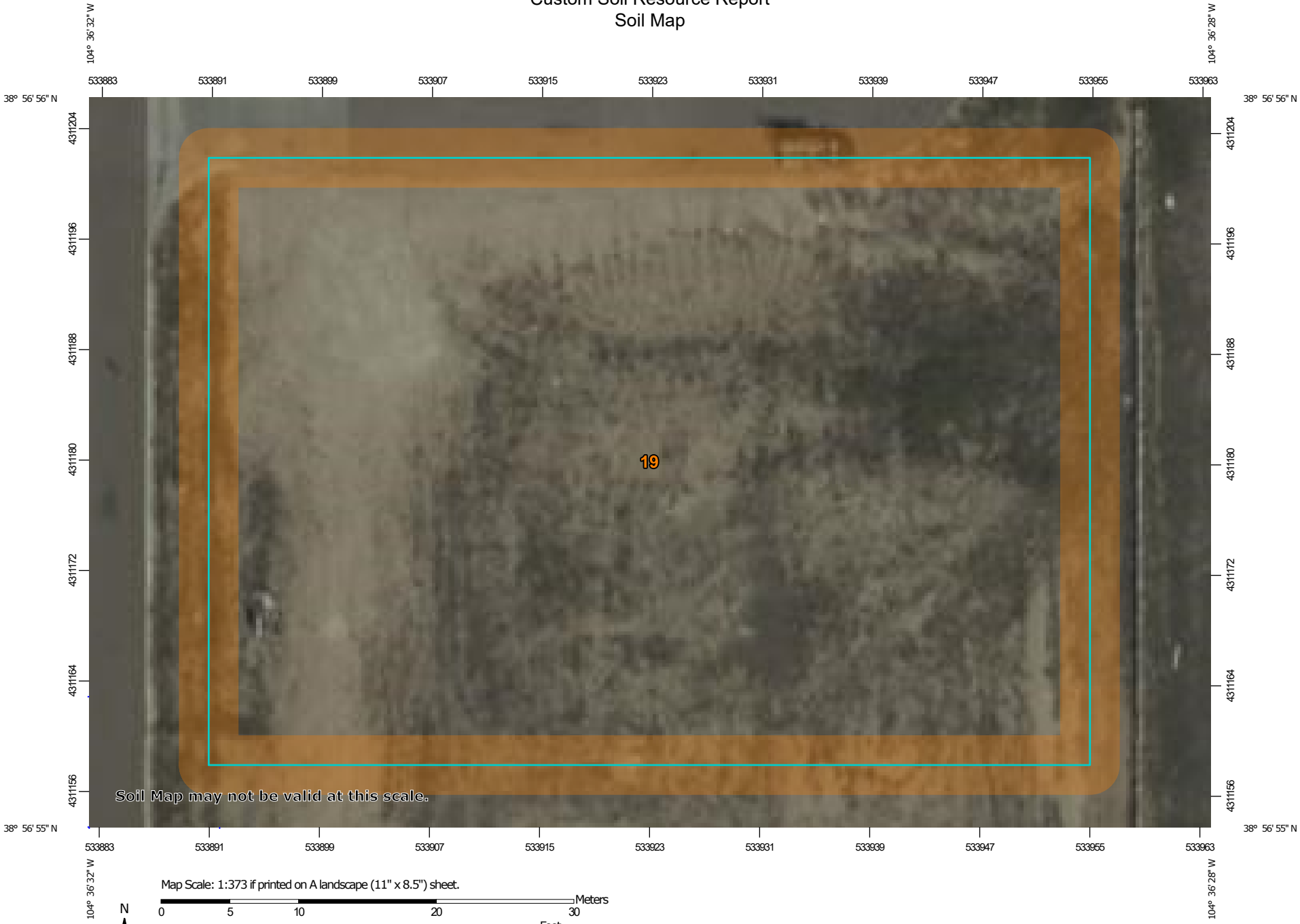
Contents

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:373 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 5 10 20 30

Feet
0 15 30 60 90

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 22, Sep 3, 2024

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

Date(s) aerial images were photographed: Sep 11, 2018—Oct 20, 2018

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
19	Columbine gravelly sandy loam, 0 to 3 percent slopes	0.7	100.0%
Totals for Area of Interest		**0.7**	**100.0%**

Map Unit Descriptions

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

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

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

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

El Paso County Area, Colorado

19—Columbine gravelly sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 367p
Elevation: 6,500 to 7,300 feet
Mean annual precipitation: 14 to 16 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 125 to 145 days
Farmland classification: Not prime farmland

Map Unit Composition

Columbine and similar soils: 97 percent
Minor components: 3 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Columbine

Setting

Landform: Fans, fan terraces, flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

A - 0 to 14 inches: gravelly sandy loam
C - 14 to 60 inches: very gravelly loamy sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.5 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: R049XY214CO - Gravelly Foothill
Hydric soil rating: No

Minor Components

Fluvaquentic haplaquolls

Percent of map unit: 1 percent
Landform: Swales
Hydric soil rating: Yes

Other soils

Percent of map unit: 1 percent
Hydric soil rating: No

Pleasant

Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

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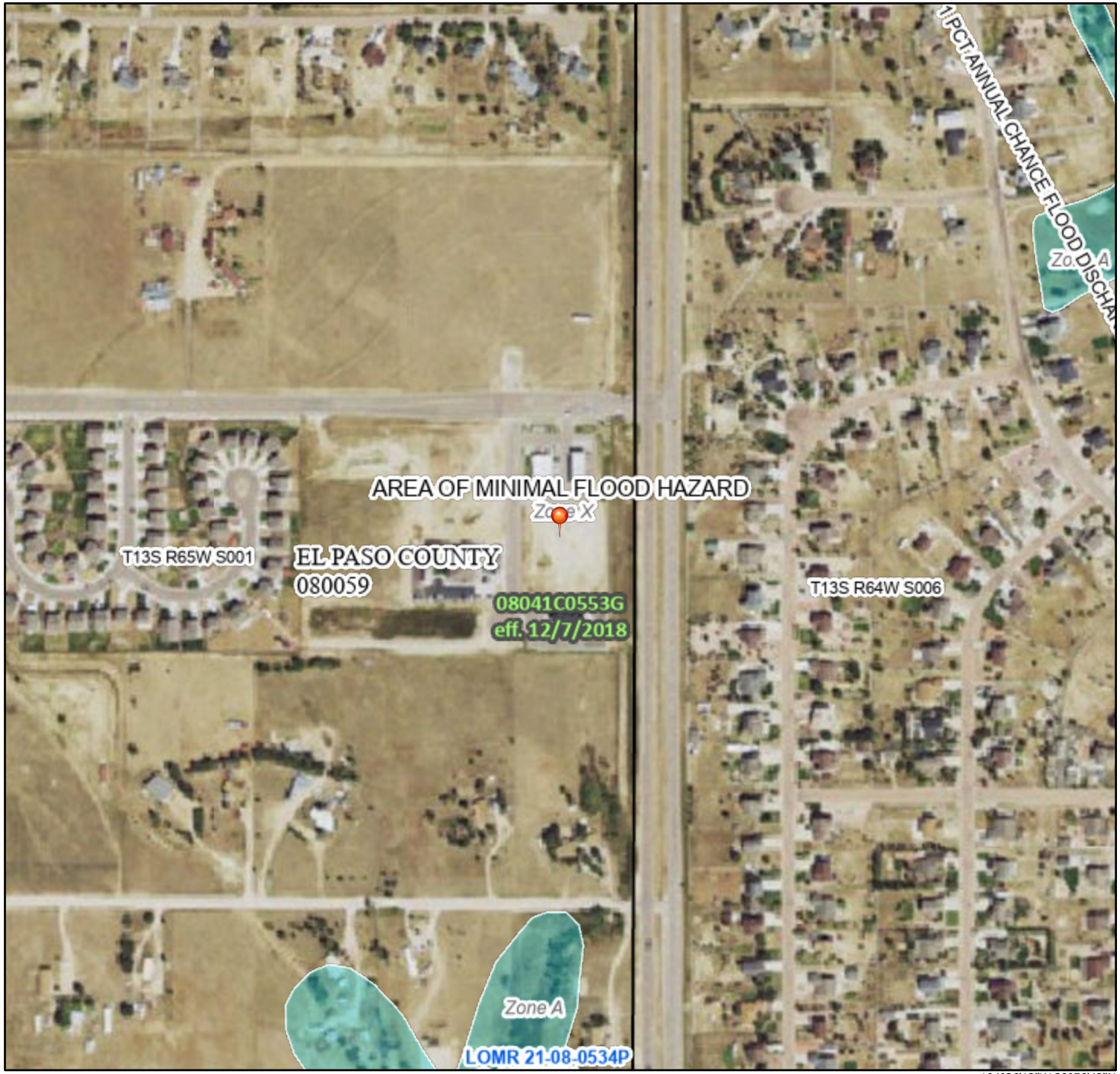
National Flood Hazard Layer FIRMette

FEMA

104°36'50"W 38°57'10"N



0 250 500 1,000 1,500 2,000 Feet

1:6,000

104°36'12"W 38°56'42"N

Basemap Imagery Source: USGS National Map 2023

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
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 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

N

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

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