CITY OF LOUISVILLE
STORMWATER MANAGEMENT PLAN (SWMP)
CONSTRUCTION ACTIVITIES

Name and Location of Project:
Redtail Ridge Filing 1
SITUATED IN THE SOUTH 1/2 OF SECTION 20, THE NORTH 1/2 OF SECTION 29,
TOWNSHIP 1 SOUTH, RANGE 69_WEST OF THE 6TH PM, CITY OF LOUISVILLE,
COUNTIY OF BOULDER, STATE OF COLORADO
City of Louisville, County of Boulder, City and County of Broomfield

Operator: (Name, Address, and Phone Number)
Garrett Honeyman
Vice President, Brue Baukol
Garrett.honeyman@bruebaukol.com
303-952-4435

Person Responsible for Implementing SWMP (SWMP Administrator):
Garrett Honeyman

Name, Address, Phone Number, and Email Address
Garrett.honeyman@bruebaukol.com
303-952-4435

City Permit Number: _____

CDPHE Stormwater Permit Number: _____

NOTE: A WORKING COPY OF THIS SWMP MUST BE KEPT AT THE CONSTRUCTION SITE OR BE LOCALLY AVAILABLE FOR REVIEW BY the CITY OF LOUISVILLE.

A COPY OF CDPHE'S STORMWATER GENERAL PERMIT FOR THIS PROJECT MUST BE ATTACHED TO THIS SWMP.

GUIDANCE FOR SELECTING AND IMPLEMENTING BMPs IS AVAILABLE IN THE CDPHE STORMWATER PERMIT REQUIREMENTS WEBSITE http://www.colorado.gov/cs/Satellite/CDPHE-WQ/CBON/1251596875260 AND URBAN DRAINAGE AND FLOOD CONTROL DISTRICT'S DRAINAGE CRITERIA MANUAL, VOL. 3.

PLEASE NOTE, THIS TEMPLATE MAY NOT MEET ALL REQUIREMENTS OF THE CDPHE STORMWATER PERMIT.

ATTACH ADDITIONAL PAGES WHEN NECESSARY TO PROVIDE THE REQUIRED INFORMATION.

Submitted: April 3, 2020

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II. PROJECT DESCRIPTION

Description of the Proposed Construction Activity

The existing Site will be cleared and regraded as a master development to create future developable parcels. This master development includes public roadways, utilities, full spectrum detention ponds and Rock Creek Tributary I. Estimated cut/fill volumes for filing 1 are 1,230,796 yd^3 of cut, and 981,149 yd^3 of fill. See Appendix C for Cut and Fill Map.

Intended Sequence of Major Soil Disturbing Activities

A description of phasing of construction activities to minimize the amount of land disturbance at one time, including a schedule which includes the sequence of construction (i.e., grubbing, excavating, grading, utilities and infrastructure installation) and the stormwater management practices or facilities to be employed during each operation of the sequence. Include an estimate of the anticipated start date and final stabilization date.

1. Filing 1
    a. BMP Installation/Clearing & Grubbing: July 2021 – October 2021
    b. Earthwork: October 2021 – April 2022
    c. Grading/Utility, Installation/Roadway, Construction/Final Stabilization: April 2022 – July 2023
2. Filing 2
    a. BMP Installation/Clearing & Grubbing: March 2023 – June 2023
    b. Earthwork: June 2023 – December 2023
    c. Grading/Utility, Installation/Roadway, Construction/Final Stabilization: December 2023 – March 2024

Total Area of Site (acres)	Total Area to be Disturbed (acres)
390.45 acres	(On-Site: 306.6 acres & Off-Site: 8.54 acres)

Pre-Proiect Runoff Coefficient

0.37

Post-Proiect Runoff Coefficient

0.50

Provide a description of the existing soil, land use, and/or water quality data of any discharges from the site. This information only needs to be included if it was used in development of the SWMP, such as for BMP design. Existing water for adjacent waterways that may receive discharges from the site is also recommended, if available

The soils on the existing Site are mainly clay loams with a small amount of Terrace escarpments located on the south side of the Site. The Site was constructed to be a ConocoPhillips campus but has been vacant for some time. The Site is currently zoned P-C. The majority of the runoff from the site drains to Rock Creek or to the Rock Creek floodplain. According to the Summary of Previous Investigations for the Former ConocoPhillips Site issued by CTL|Thompson on April 19, 2019, the soil borings for the Site consist of existing fill and/or natural sandy clay with less amounts of sand, gravel and cobble, which overlie claystone and interbedded claystone/sandstone bedrock of the Laramie Formation. Most of the soils on the Site are Type C soils.

Provide a description of the existing vegetation at the site and an estimate of the percent vegetative ground cover.

The existing Site consists of remnants of buildings slabs, several private roadways and native grasses with some trees and bushes along the ponds and drainage channels. The existing site is roughly 95% vegetation.

Receiving Water(s): Identify the name and location of the streams, rivers, ditches, drainages, lakes or wetlands (both perennial and intermittent) that will receive runoff from the construction site. If the site will drain to the municipal storm drain system, identify the receiving water to which the system discharges.

The north portion of the Site is tributary to the Rock Creek Tributary I, which eventually combines with Coal Creek and is tributary to Boulder Creek. Goodhue Ditch traverses the far northeast corner of the site, and a culvert crossing of Campus Drive is planned for Goodhue Ditch. The local ditches that run throughout the site have been abandoned and are not considered with the proposed Filing 1 drainage plan. As the site will not be mass graded, the local ditches throughout the will be left in pace or demolished in places with adjacent grading.

III. SITE MAPS

Attach A. General Location Map and B. Detailed Site Map. Note that site maps must be updated and revised as site conditions change and new BMPs are implemented.

The Detailed Site Map must indicate the following:

1. Construction site boundaries.
2. Existing and proposed topography and drainage patterns drawn to scale with north arrow.
3. Areas of soils that will be disturbed and areas that will not be disturbed.
4. Locations of structural and non-structural controls identified in SWMP (including individual lot controls when necessary)
5. The location and volume of structural BMPs, such as sediment ponds and stormwater management basins.
6. Areas of cut and fill.
7. Surface water locations including springs, wetlands, streams, lakes, water wells, etc., on or within 200 feet of the site.
8. Location of existing and planned buildings, roads, parking facilities, and utilities.
9. The location of permanent BMPs to be used to control pollutants in stormwater after construction has been completed.
10. Locations of areas designated for the storage or disposal of building materials, equipment, solid, sanitary, and toxic wastes (including dumpster areas), compounds such as fertilizers, lime, asphalt, or concrete and vehicle fueling, concrete truck washout, designated construction entrances, dedicated asphalt/concrete batch plants, in-stream activities including stream crossings.
11. Details for all BMPs used onsite.
12. Location and description of any discharge(s) associated with Industrial Activity other than construction, including any stormwater discharges from dedicated asphalt or concrete plants covered under General Permit.
13. Provide Maps on 24" x 36"paper.

IV. STORMWATER MANAGEMENT CONTROLS

A. Identify Potential Pollutants and Activities

Below is a comprehensive source list of potential sediment and pollutants associated with construction, which may reasonably be expected to affect the quality of stormwater discharges from the construction site. Add rows if additional potential sources of pollution are not included.

Identify and list all potential sources of pollution, which may reasonably be expected to affect the quality of stormwater discharges from the construction site. Identify if a potential pollutant source that is applicable to the construction site by double right clicking Yes/No then type "yes" or "no" in the applicable information.

Control measures must be properly selected, installed, and maintained in accordance with the manufacturer's specifications and good engineering practices. Controls must be inspected at least weekly and sediments must be removed from when the design capacity has been reduced to 50%. Construction materials, chemicals, wastes, litter and debris must be prevented from becoming a stormwater pollutant source. Offsite material storage areas used solely by the permitted project must also be addressed.

Potential Pollution Source	Potential on This Site?	Control Measures *(Contractor to fill out measures for each pollution source identified as "Yes")*	BMP Implementation
All Disturbed and Stored Soils - grading - spoils - stockpiles	Yes	Silt Fence Soil Stockpile Stabilized Staging Area Sediment Control Log Vehicle Tracking Control Stabilized Roadway Dust Mitigation Rock Socks Temporary/Permanent Seeding Mulching	1. Install BMPs prior to major construction. 2. Delineate protected areas prior to major construction. 3. Material management effective once material arrives on site. 4. Place trash receptacles on site prior to major construction. 5. Implement spill response procedures as needed. 6. Implement stockpile management controls as needed. 7. Delineate vehicle travel areas prior to major construction, adjust as needed.
Vehicle Tracking of Sediments - all permitted area vehicle traffic	Yes	Vehicle Tracking Control Stabilized Roadway Street Sweeping	1. Install BMPs prior to major construction. 2. Delineate vehicle travel areas prior to major construction, adjust as needed. 3. Install VTC BMP prior to construction. 4. Implement street sweeping in conjunction with start of major construction and as needed.

Potential Pollution Source	Potential on This Site?	Control Measures *(Contractor to fill out measures for each pollution source identified as "Yes")*	BMP Implementation
Management of Contaminated Soils - fluid spills	Yes	Standard Operating Procedure, Stabilized Staging Area	1. Implement hazardous materials management as needed. 2. Implement spill response procedures as needed. 3. Implement stockpile management controls as needed.
Loading and Unloading Activities - construction materials	Yes	Stabilized Staging Area Vehicle Tracking Control Stabilized Roadway	1. Materials management effective once materials arrive on site and effective throughout the project. 2. Delineate vehicle travel areas prior to major construction, adjust as needed.
Outdoor storage activities - building materials - fertilizers - chemicals	Yes	Stabilized Staging Area Standard Operating Procedure Stockpile Management Good Housekeeping Practices	1. Designate materials storage areas prior to the delivery of materials. 2. Materials left outdoors must be covered if they can become a pollutant when mixed with water. 3. Secondary containment must be used for hazardous materials.
Vehicle equipment maintenance and fueling - gas - diesel - oil - lubricants - hydraulic fluids	Yes	Stabilized Staging Area Standard Operating Procedure	1. Implement spill prevention controls as needed. 2. Designate fuel storage area as needed. 3. Implement spill response and notification procedures as needed.
Dust Control - Wind Transport - Saw Cutting Activities	Yes	Surface Roughening Temporary Seeding & Mulching Dust Mitigation	1. Implement dust control in conjunction with soil disturbing activities and as needed. 2. Implement temporary soil stabilization measures as soon as practical. 3. Implement street sweeping at the start of major construction and maintain as needed. 4. Delineate protected areas prior to major construction.
Routine maintenance activities - fertilizers - pesticides - detergents - fuels - solvents - oils, etc.	Yes	Stabilized Staging Area	1. Designate materials storage areas prior to their arrival on site. 2. Practice hazardous waste management procedures during the storage of such materials. 3. Install sediment and erosion control BMPs prior to conducting landscape activities.

Potential Pollution Source	Potential on This Site?	Control Measures *(Contractor to fill out measures for each pollution source identified as "Yes")*	BMP Implementation
On-site waste management practices	Yes	Stabilized Staging Area Good Housekeeping Practices	1. Place trash receptacles on site prior to major construction. 2. Place designated watertight receptacles or washout area(s) prior to proceeding with an activity that is known to produce liquid waste. 3. Implement hazardous waste management procedures as needed.
Concrete truck/equipment washing	Yes	Concrete Washout Area Good Housekeeping Practices	1. Install designated concrete washout(s) prior to commencement of concrete activities.
Dedicated asphalt and concrete batch plants	No		1. Install secondary containment BMPs prior to using dedicated batch plants. 2. Dedicated washout area must be established before construction begins. 3. Trash receptacles on site prior to major construction activities. 4. Material management effective once material arrives on site.
Non-industrial waste sources – worker trash and portable toilets	Yes	Stabilized Staging Area Good Housekeeping Practices	1. Place temporary sanitary facilities on site as needed and protect from off-site discharge. 2. Trash receptacles on site prior to major construction activities.
Waste from geo-technical testing, potholing, saw cutting, and utility borings for locates	Yes	Soil Stockpile Stabilized Staging Area Sediment Control Log	1. Implement dust control in conjunction with soil disturbing activities and as needed. 2. Designate materials storage areas prior to their arrival on site. 3. Trash receptacles on site prior to major construction activities.
Fly Ash - concrete - flow fill	Yes	Concrete Washout Area	1. Install designated concrete washout(s) prior to commencement of concrete activities. 2. Implement hazardous waste management procedures as needed.
Demolition of Structures - concrete - asphalt - steel	Yes	Soil Stockpile Stabilized Staging Area Good Housekeeping Practices	1. Implement dust control in conjunction with soil disturbing activities and as needed. 2. Trash receptacles on site prior to major construction activities.
Other areas or procedures where potential spills can occur	No		1. Implement hazardous waste management as needed. 2. Implement spill response and notification procedures as necessary.

Potential Pollution Source	Potential on This Site?	Control Measures *(Contractor to fill out measures for each pollution source identified as "Yes")*	BMP Implementation
Construction Dewatering	No		* **Construction Dewatering water** can NOT be discharged to surface waters or to storm sewer systems without separate permit coverage. The discharge of Construction Dewatering water to the ground, under specific conditions, may be allowed by the Stormwater Construction Permit when appropriate BMPs are implemented. Additional information on this subject is available in the Stormwater Fact Sheet – Construction, available from the Division's web site at http://www.colorado.gov/cs/Satellite/CDPHE-WQ/CBON/1251596875260
Process water from power washing of buildings, streets, sidewalks, driveways, etc	Yes	Sediment Basin Inlet Protection Rock Socks Sediment Control Log	
Insert any additional pollutant sources associated with construction that are not listed above here. (add rows as necessary)			

Potential hazardous material/chemical pollutants, to stormwater runoff:

Potential On This Site	Material/ Chemical	Physical Description	Stormwater Pollutants	Location
Yes	Fertilizer	Liquid or solid grains	Nitrogen, phosphorous	Newly seeded areas
No	Cleaning solvents	Colorless, blue, or yellow-green liquid	Perchloroethylene, methylene chloride, trichloroethylene, petroleum distillates	Staging areas
Yes	Asphalt	Black solid	Oil, petroleum distillates	Streets
Yes	Concrete and Grout	White solid/grey liquid	Limestone, sand, pH, chromium	Curb and gutter, sidewalk, building construction
Yes	Curing compounds	Creamy white liquid	Naphtha	Curb and gutter, sidewalk, driveways, concrete slabs
Yes	Hydraulic oil/ fluids	Brown, oily petroleum hydrocarbon	Mineral oil	Leaks or broken hoses from equipment
Yes	Gasoline	Colorless, pale brown or pink petroleum hydrocarbon	Benzene, ethyl benzene, toluene, xylene, MTBE	Secondary containment/staging area
Yes	Antifreeze/ coolant	Clear green/yellow liquid	Ethylene glycol, propylene glycol, heavy metals (copper, lead, zinc)	Leaks or broken hoses from equipment or vehicles
Yes	Sanitary toilets	Various colored liquid	Bacteria, parasites, and viruses	Staging areas
Insert any additional hazardous material/chemical pollutants that are not listed above here. (add rows as necessary)				

B. Description of Best Management Practices

Provide a description of the temporary structural BMPs (e.g. temporary diversion dikes, silt fences, fiber rolls, check dams, sediment traps, storm drain inlet protection, etc.) that will be used during construction to divert or filter flows from exposed soils, reduce flow velocities or temporarily store flows and limit runoff from the exposed areas of the site. All sediment basins must be designed to meet most recent City of Louisville Construction and Design standards and/or Urban Drainage and Flood Control Manual, most recent volume, approved or referenced by the CDPHE.

Multiple structural BMPs are used during each phase of construction to minimize erosion and the transport of sediment. Describe the BMPs that will be implemented to control pollutants in stormwater discharges. For each major activity identified, complete the following:

- ✓ Clearly describe appropriate control measures.
- ✓ Describe the maintenance and inspection procedures that will be used for that specific BMP.
- ✓ Include protocols, thresholds, and schedules for cleaning, repairing or replacing damaged or failing BMPs.

- Included below is the main BMP description *Expected Level of BMP Information* that addresses the following:
  - ✓ What BMPs will be installed? (Phase of Implementation)
  - ✓ When will the BMPs be implemented and/or removed?
  - ✓ Where will the BMPs be implemented?
  - ✓ How will the BMPs be maintained?

Description:

1. BMP: Silt Fence (SF) – Appendix B

What: A woven geotextile fabric attached to wooden posts and trenched into the ground. It is used to intercept sheet flow runoff from disturbed areas.

When/Installation Schedule: Silt fence shall be installed prior to all land disturbing activities. Silt fence may be removed when upstream areas are stabilized.

Where: Please see the SWMP plans for the silt fence locations.

Installation, Inspection, and Maintenance: Silt fence shall be installed per the silt fence detail provided in Appendix B. The Permittee shall inspect and maintain all silt fence throughout construction. Any section of silt fence that has a tear, hole, slumping, undercutting or has been bypassed should be replaced with a new section. Accumulated sediment should be removed before it reaches a depth of 50% the height of the silt fence.

2. BMP : Vehicle Tracking Control (VTC) – Appendix B

What: A stabilized construction site access where vehicles exit the site onto paved public roads. It helps remove sediment from vehicles, reducing tracking onto the paved surface.

When/Installation Schedule: Installed prior to all land disturbing activities. Remove at the end of construction.

Where: Please see the SWMP plans for vehicle tracking locations.

Installation, Inspection, and Maintenance: Shall be installed per the vehicle tracking control detail provided in Appendix B. Vehicle tracking control shall be inspected and maintained throughout construction. Replace aggregate or material used for stabilization at entrance/exit as needed. Ensure drainage ways are not blocked by vehicle tracking control.

3. BMP : Concrete Washout Area (CWA) – Appendix B

What: An area created using one of several approaches designed to receive wash water from washing of tools and concrete mixer chutes, liquid concrete waste from dump trucks, mobile batch mixers, or pump trucks. Three approaches are allowable: excavation of a pit in the ground, use of an above ground storage area, or use of prefabricated haul-away concrete washout containers.

When/Installation Schedule: Installed prior to any concrete pours. Removed upon completion of concrete pours.

Where: Please see the SWMP plans for concrete washout area locations.

Installation, Inspection, and Maintenance: Shall be installed per the concrete washout area detail provided in Appendix B. Concrete washout areas shall be inspected and maintained throughout construction activities. Provide adequate signage throughout the site to ensure that concrete washout areas can be identified.

4. BMP : Stockpile Management (SP) – Appendix B

What: Area on site where soils and other erodible materials are stored. Includes measures to minimize erosion and sediment transport from soil stockpiles.

When/Installation Schedule: Installed prior to any land disturbing activities. Remove upon completion of land disturbing activities.

Where: Please see SWMP plans for stockpile locations.

Installation, Inspection, and Maintenance: Shall be installed per the stockpile management detail provided in Appendix B and/or as directed by the City. Return area to preexisting conditions unless otherwise directed by the City. Stockpiles shall be inspected and maintained throughout construction activities.

5. BMP : Stabilized Staging Area (SSA) – Appendix B

What: Clearly designated area where construction equipment and vehicles, stockpiles, waste bins, and other construction-related materials are stored.

When/Installation Schedule: Installed prior to any construction activities. Removed upon completion of construction activities.

Where: Please see SWMP plans for staging area locations.

Installation, Inspection, and Maintenance: Shall be installed per the stabilized staging area detail provided in Appendix B. Staging areas shall be inspected and maintained through construction activities. A stable surface cover of gravel and perimeter controls shall be maintained as a part of the staging area. Return area to preexisting condition unless otherwise directed by the City.

6. BMP : Sediment Control Log (SCL) – Appendix B

What: A linear roll made of natural materials such as straw, coconut fibers, or compost. They are used as a sediment barrier to intercept sheet flow runoff from disturbed areas.

When/Installation Schedule: Shall be installed prior to any land disturbing activities. Shall be removed upon final stabilization.

Where: Please see SWMP plans for sediment control log locations.

Installation, Inspection, and Maintenance: Shall be installed per the sediment control log detail provided in Appendix B. Control logs shall be inspected and maintained through construction activities. Accumulated sediment should be removed before it reaches a depth of 50% the height of the sediment control log. Sediment control logs shall be replaced when material failure occurs.

7. BMP : Inlet Protection (IP) – Appendix B

What: Permeable barriers installed around an inlet to filter runoff and remove sediment prior to entering a storm drain inlet. These can be constructed from rock socks, sediment control logs, silt fence, block and rock socks, or other materials approved by the City of Louisville. Area inlets can also be protected by over-excavating around the inlet to form a sediment trap.

When/Installation Schedule: Installed prior to any land disturbing activities. Removed upon final stabilization.

Where: Please see SWMP plans for inlet protection locations.

Installation, Inspection, and Maintenance: Shall be installed per the inlet protection detail provided in Appendix B. Inlet protection shall be inspected and maintained throughout construction activities. Ensure that flows do not bypass the inlet protection when flowing to the storm drainage system. Accumulated sediment should be removed before it reaches a depth of 50% the height of the inlet protection. Replace due to material failures.

8. BMP : Rock Sock (RS) – Appendix B

What: Gravel that has been wrapped by wire mesh or a geotextile to form an elongated cylindrical filter. Used either as a perimeter control or as part of inlet protection. These are intended to trap sediment from storm water runoff that flows onto roadways as a result of construction activities.

When/Installation Schedule: Installed prior to any land disturbing activities. Removed upon final stabilization.

Where: Please see SWMP plans for rock sock locations.

Installation, Inspection, and Maintenance: Shall be installed per the rock sock detail provided in Appendix B. Rock socks shall be inspected and maintained throughout construction activities. Accumulated sediment should be removed before it reaches a depth of 50% the height of the rock sock.

9. BMP : Temporary Outlet Protection (TOP) – Appendix B

What: Typically consists of riprap or rock aprons at the conveyance outlet. These help to reduce erosion immediately downstream or a pipe, culvert, slope drain, rundown or other conveyance with concentrated, high-velocity flows.

When/Installation Schedule: Installed prior to any land disturbing activities. Removed upon final stabilization.

Where: Please see SWMP plans for temporary outlet protection locations.

Installation, Inspection, and Maintenance: Shall be installed per the temporary outlet protection detail provided in Appendix B. Temporary outlet protections shall be inspected and maintained throughout construction activities. Remove sediment accumulated at the outlet before the outlet protection becomes buried and ineffective.

10. BMP : Sediment Basin (SB) – Appendix B

What: A temporary pond built to capture eroded or disturbed soil transported in storm runoff prior to discharge from the site. These are designed to capture site runoff and slowly release it to allow time for settling of sediment prior to discharge.

When/Installation Schedule: Installed prior to any land disturbing activities. Removed upon construction of full-spectrum detention ponds.

Where: Please see SWMP plans for sediment basin locations.

Installation, Inspection, and Maintenance: Shall be installed per the sediment basin detail provided in Appendix B. Sediment basins shall be inspected and maintained through construction activities. Basins will need to be dredged typically when the design storage volume is no more than 33% filled with sediment. Embankments will need to be stabilized and may need to be re-stabilized during construction.

11. BMP : Construction Fence (CF) – Appendix B

What: Fence that restricts site access to designated entrances and exits, delineates construction site boundaries and keeps construction out of sensitive areas such as natural areas to be preserved as open space, wetlands and riparian areas. These may be chain link or plastic mesh.

When/Installation Schedule: Installed prior to any construction activities. Removed upon final stabilization.

Where: Please see SWMP plans for construction fence locations.

Installation, Inspection, and Maintenance: Shall be installed per the construction fence detail provided in Appendix B. Construction fencing shall be inspected and maintained through construction activities.

12. BMP : Surface Roughening (SR) – Appendix B

What: An erosion control practice that involves tracking, scarifying, imprinting, or tilling a disturbed area to provide temporary stabilization of disturbed areas. This creates variations in the soil surface that help to minimize wind and water erosion.

When/Installation Schedule: Shall be constructed where necessary to ensure soil stabilization.

Where: Please see SWMP plans for surface roughening locations.

Installation, Inspection, and Maintenance: Shall be constructed per the surface roughening detail provided in Appendix B.

13. BMP : Temporary Stream Crossing (TSC) – Appendix B

What: Where an actively flowing watercourse must be crossed regularly by construction vehicles, a temporary crossing should be provided.

When/Installation Schedule: Shall be installed prior to any land disturbing activities. Remove when it is no longer needed for construction.

Where: Please see SWMP plans for Temporary Stream Crossing locations.

Installation, Inspection, and Maintenance: Shall be constructed per the Temporary Stream Crossing detail provided in Appendix B. Temporary Stream Crossings shall be inspected and maintained throughout construction activities.

14. BMP : Check Dams (CD) – Appendix B

What: Temporary grade control structures placed in drainage channels to limit the erosivity of stormwater by reducing flow velocity.

When/Installation Schedule: Shall be installed prior to any upstream land disturbing activities. Remove after final soil stabilization measures are established upstream and downstream.

Where: Please see SWMP plans for Check Dam locations.

Installation, Inspection, and Maintenance: Shall be constructed per the Check Dam detail provided in Appendix B. Temporary Stream Crossings shall be inspected and maintained throughout construction activities per the Check Dam detail provided in Appendix B.

C. Spill Prevention and Response

Describe the response measures that will be provided if a spill occurs- include emergency contacts and telephone numbers, and directions on how to properly dispose of toxic or hazardous wastes.

The following information specific to the City of Louisville should be included:

Reporting Spills

Any spill or discharge of any pollutant (ex: oil, paints, fuels, hazardous liquids, sediment, or super-chlorinated water) that reaches storm drains or enters "Waters of the State" must be reported to the CDPHE Emergency Spill Reporting line at 1-877-518-5608. If a spill or leak is of a hazardous substance that exceeds 1 pint or is of an unknown substance of any amount, call 911 and notify the Colorado Department Public Health and Environment (CDPHE) 24-hour emergency spill notification hotline at 1- 877-518-5608, immediately. If the spill is more than 25 gallons of a petroleum product from a regulated storage tank or delivery truck or any amount that causes a sheen on nearby surface water, it must be reported to the Division of Oil and Public Safety at the
Colorado Department of Labor and Employment within 24 hours at (303) 318-8547 or to CDPHE Emergency Spill Reporting line at 1-877-518-5608 – if after normal business hours. If cleanup cannot be accomplished within 24 hours, the Division of Oil and Public Safety must be notified immediately.

For non-emergency spills, call 303-441-4444 and page Boulder County Public Health Environmental Emergency Response Team to assist with cleanup.
Report spills to the Site Supervisor (Name): Kevin Trott
Phone (303)335-4611
Report spills that reach storm drains or waterways to your city's Stormwater Coordinator: Cameron Fowlkes, (303) 335-4611

V. Final Stabilization and Long-term Stormwater Management

A. Final Stabilization and Long-term Stormwater Management

Describe the permanent stabilization (e.g. permanent revegetation and/or rolled erosion control products) that will be provided on disturbed portions of the site where construction activities have permanently ceased. Final stabilization with vegetation must achieve a uniform cover with a minimum density of 70% of what was on the site prior to commencement of construction activities. Permanent stabilization must be achieved prior to CDPHE issuing an **INACTIVATION NOTICE**.

Include a description of the practices that will be used to achieve final stabilization of all disturbed areas at the site, including, but not limited to:

- Seed mix selection and methods of seed application
- Soil preparation and amendments
- Straw, hydromulch, rolled erosion control products
- Sediment control BMPs to be maintained until final stabilization is achieved

Areas of the development will have permanent vegetation installed in conformance with the approved landscape plan. Final stabilization is reached when all soil-disturbing activities at the Site have been completed, and uniform vegetative cover has been established with a density of at least 70% of pre-disturbance levels or equivalent permanent, physical erosion reduction methods have been employed. Due to the size of the work area, the stabilization should occur in phases or in coordination with completion of work (utility, etc.) in area.

VI. INSPECTION/MAINTENANCE PROCEDURES

The contractor or his qualified agent is required to inspect all disturbed areas, areas used for storage of materials and equipment that are exposed to precipitation, including vehicle entrance and exit locations and all erosion and sediment control BMPs. Inspections shall occur EVERY 14 days, and after any actual precipitation or snowmelt event that causes surface erosion.

A. Inspection and Maintenance of Stabilization and Structural Practices

Provide a description of the practices that will be used to inspect and maintain all Temporary and Permanent Stabilization Practices described in Section IV. Stormwater Management Controls,

At a minimum, the Permittee or contractor shall produce and retain weekly written inspection records for all BMP's and after significant precipitation evens. All necessary maintenance and repair shall be completed immediately. However, street sweeping is to be completed by the close of the business day or on an as needed basis. It is the responsibility of the contractor to have all erosion control devices in place and effective, prior to a storm event. Permittee or Contractor shall produce written inspection records every seven (7) days and after significant precipitation events. The GESC Administrator must maintain a record of inspection results for a period of three (3) years following expiration or inactivation of permit coverage.

Record Keeping and Documenting Inspections
The following items, at a minimum, must be documented as a part of the Site inspections:
i. The inspection date;
ii. Name(s) and title(s) of personnel making the inspection;
iii. Weather conditions at the time of inspection;
iv. Phase of construction at the time of inspection;
v. Estimated acreage of disturbance at the time of inspection;
vi. Location(s) of discharges of sediment or other pollutants from the Site;
vii. Location(s) of control measures requiring routine maintenance;
viii. Location(s) and identification of inadequate control measures requiring corrective actions;
ix. Location(s) and identification of additional control measures needed that were not in place at the time of inspection;
x. Description of the minimum inspection frequency and any deviations from the minimum inspection schedule; and,
xi. After adequate corrective action(s) has been taken, or where a report does not identify any incidents requiring corrective action or maintenance, the report shall contain a signed statement indicating the Site is in compliance with the permit to the best of the signer's knowledge and belief.

VII. CERTIFICATION OF COMPLIANCE

A. This SWMP must be certified that it is consistent with all applicable Federal, State and Local regulations, or other approved site plans or permits. It is to be prepared in accordance with the CDPHE Stormwater Management Plan regulations and requirements. This SWMP must be updated as necessary to remain consistent with changes in other site plans that effect soil disturbing activities, site drainage patterns or any other activity that may impact stormwater runoff quality.

B. Minor modifications to SWMP: Based on inspections performed by the owner or by city personnel, modifications to the SWMP will be necessary if at any time the specified BMPs do not meet the objectives of this chapter of the Municipal Code or equivalent or better BMPs are implemented. All minor modifications shall be implemented immediately and shall be recorded on the owner's copy of the SWMP which shall be located on site at all times.

C. Major modifications to SWMP: Whenever there is a significant change in design, construction, operation, or maintenance, which has a significant effect on the hydrology or potential for discharge of pollutants to the MS4 or receiving waters, a revised SWMP shall be submitted to the city for review and approval.

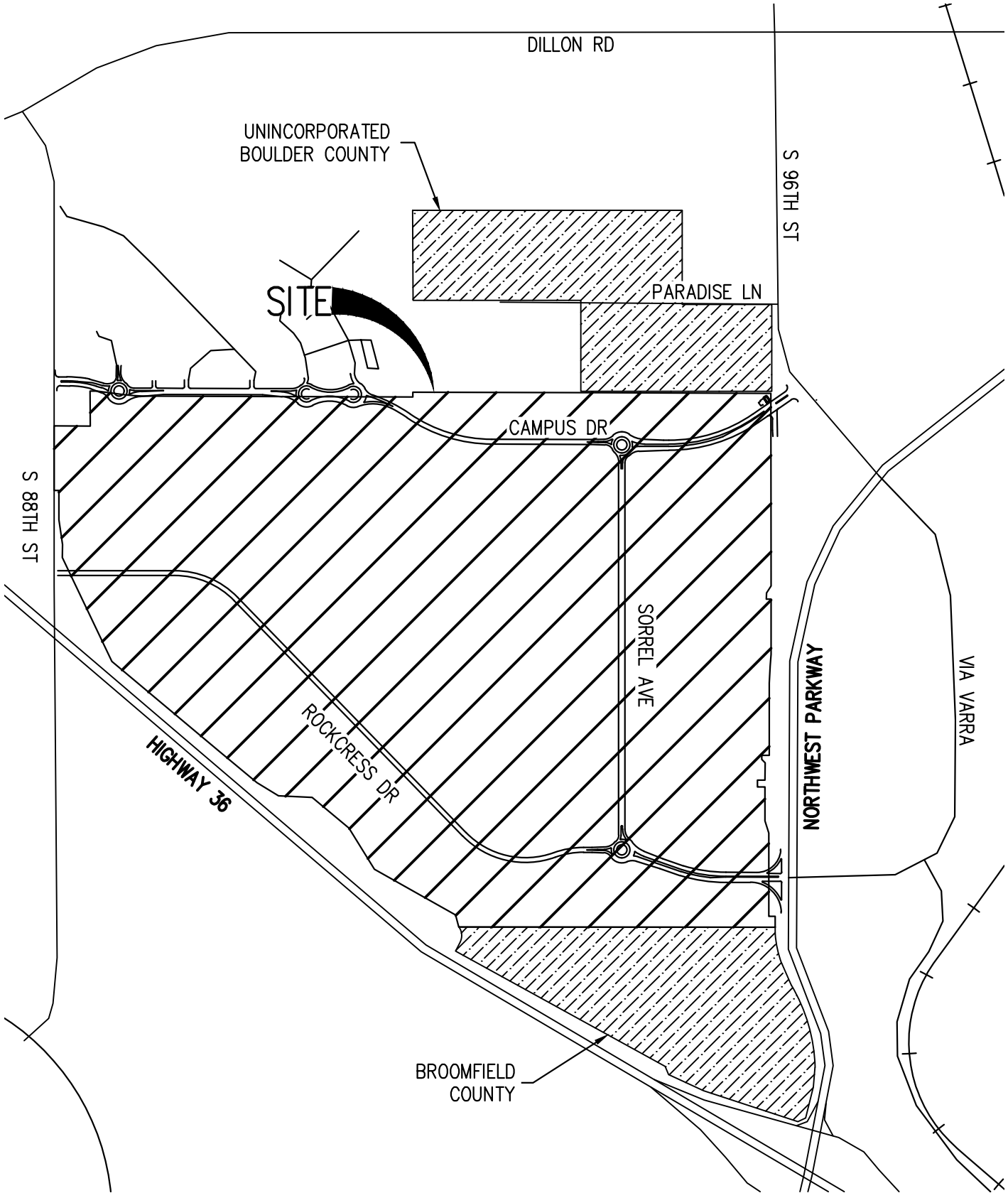
OWNER/OPERATOR CERTIFICATION STATEMENT

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Certification:

Print Name	Title
Signature	Date
Print Name	Title
Signature	Date

Appendix A – General Location Map



SCALE: 1" = 1000'

Plotted: MON 03/01/21 11:24:19A By: Mitch Bretall Filepath: p:\190108\engineering\xref\vic map.dwg Layout: layout1

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH.

ISSUE DATE: 06-06-2019	PROJECT #: 190108
DATE	REVISION COMMENTS

BRUE BAUKOL PARTNERS

REDTAIL RIDGE
VICINITY MAP

HARRIS KOCHER SMITH
1120 Lincoln Street, Suite 1000
Denver, Colorado 80203
P: 303.623.6300 F: 303.623.6311
HarrisKocherSmith.com

DSN'D BY: TJS
CHK'D BY: TJS
DRAWN BY: SJA

SHEET NO.
1
1 OF 1

Appendix A - Copy of the State CDPS Construction Stormwater Permit

CDPS Construction Stormwater Permit needs to be filled out at Colorado Environmental Online Services (CEOS).
https://ceos.colorado.gov/CO/CEOS/Public/Client/CO_CIMPLE/Shared/Pages/Main/Login.aspx

COLORADO
Department of Public Health & Environment

Dedicated to protecting and improving the health and environment of the people of Colorado

ASSIGNED PERMIT NUMBER

Date Received

MM DD YYYY HH:MM:SS

Revised: 3-2016

STORMWATER DISCHARGE ASSOCIATED WITH CONSTRUCTION ACTIVITIES APPLICATION

COLORADO DISCHARGE PERMIT SYSTEM (CDPS)

PHOTO COPIES, FAXED COPIES, PDF COPIES OR EMAILS WILL NOT BE ACCEPTED.

Any additional information that you would like the Division to consider in developing the permit should be provided with the application. Examples include effluent data and/or modeling and planned pollutant removal strategies.

Beginning July 1, 2016, invoices will be based on acres disturbed.
DO NOT PAY THE FEES NOW – Invoices will be sent after the receipt of the application.

Disturbed Acreage for this application (see page 4)

- ☐ Less than 1 acre ($83 initial fee, $165 annual fee)
- ☐ 1-30 acres ($175 initial fee, $350 annual fee)
- ☑ Greater than 30 acres ($270 initial fee, $540 annual fee)

A. PERMIT INFORMATION

Reason for Application

- ☑ **NEW CERT**
- ☐ **RENEW CERT**
- ☐ **MODIFICATION**
- ☐ **TRANSFER**
- ☐ **CHANGE OF CONTACT**
- ☐ **TERMINATION**

Existing Cert #

B. PERMITTED PROJECT/FACILITY INFORMATION

Facility Name: Redtail Ridge

Original ID:

Property Address 1:

Property Address 2:

County: Boulder County

City: Louisville

State: CO

Zip Code: 80027

Latitude : 39º56'38" N

Longitude : 105º8'5" W

SIC Code	Description

Receiving Water Name	Receiving Water Type
South Platte River	River

C. CONTACT INFORMATION

1) *OPERATOR – RESPONSIBLE OFFICIAL - the party that has operation control over day to day activities – may be the same as the Owner

Responsible Person (Title):

First Name:

Last Name:

Telephone No:

Email Address:

Organization:

Mailing Address:

City:

State:

Zip Code:

2) *PROPERTY OWNER (CO-PERMITTEE) RESPONSIBLE OFFICIAL

Responsible Person (Title): First Name: Last Name:

Telephone No: Email Address: Organization:

Mailing Address:

City: State: Zip Code:

3) *SITE CONTACT (local contact for questions relating to the facility & discharge authorized by this permit)

Responsible Person (Title): First Name: Last Name:

Telephone No: Email Address: Organization:

Mailing Address:

City: State: Zip Code:

4) *BILLING CONTACT

Responsible Person (Title): First Name: Last Name:

Telephone No: Email Address: Organization:

Mailing Address:

City: State: Zip Code:

5) OTHER CONTACT TYPES

Title	First Name	Last Name	Phone	Email	Address	City	State	Zip	Contact Type	Other

6) Former Permittee (transfer)

Responsible Person (Title): First Name: Last Name:

Email Address: Company:

D. LEGAL DESCRIPTION

Legal description: if subdivided, provide the legal description below, or indicate that it is not applicatable. Do not supply Township/Range/Section or metes and bounds description of the site.

Subdivision(s): Redtail Ridge Filing No. 1 Lot(s): 1 - 4 Block(s): 1 & 2

OR

☐ Not applicable (site has not been subdivided)

☐ Facility additional description info

E. AREA OF CONSTRUCTION SITE

Total area of construction site 391 acres

Total area of project disturbance 316 acres

F. NATURE OF CONSTRUCTION ACTIVITY

Check the appropriate box(s) or provide a brief description that indicates the general nature of the construction activities. (The full description of activities must be included in the Stormwater Management Plan.)

☐ Commercial Development ☐ Residential Development ☑ Highway and Transportation Development

☑ Pipeline and Utilities (including natural gas, electricity, water, and communications)

☐ Oil and Gas Exploration and Well Pad Development

☑ Non-structural and other development (i.e. parks, trails, stream realignment, bank stabilization, demolition, etc.)

☐ Other _____

G. ANTICIPATED CONSTRUCTION SCHEDULE

Construction Start Date: _____ Final Stabilization Date: _____

• Construction Start Date - This is the day you expect to begin ground disturbing activities, including grubbing, stockpiling, excavating, demolition, and grading activities.
• Final Stabilization Date - in terms of permit coverage, this is when he site is finally stabilized. This means that all ground surface disturbing activities at the site have been completed and all disturbed areas have either been built on, paved, or a uniform vegetative cover has been established with an individual plant density of at least 70 percent of pre-disturbance levels.
• Permit coverage must be maintained until the site is finally stabilized. Even if you are only doing one part of the project, the estimated final stabilization date must be for the overall project. If permit coverage is still required once your part is completed, the permit certification may be transferred to a new responsible operator.

SIGNATURE REQUIREMENTS:

TERMINATION CERTIFICATION

☐ By checking this box I understand that by submitting this notice of termination, I am no longer authorized to discharge stormwater associated with construction activity by the general permit. I understand that discharging pollutants in stormwater associated with construction activities to the waters of the State of Colorado, where such discharges are not authorized by a CDPS permit, is unlawful under the Colorado Water Quality Control Act and the Clean Water Act.

☐ **STORMWATER MANAGEMENT PLAN CERTIFICATION (on new and renewals)**
By checking this box "I certify under penalty of law that a complete Stormwater Management Plan, has been/or will be completed, prior to the commencement of any construction activity. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the Stormwater Management Plan is/or will be, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for falsely certifying the completion of said SWMP, including the possibility of fine and imprisonment for knowing violations."

THIS PORTION OF THE SIGNATURE LANGUAGE IS REQUIRED ON ALL SUBMITTALS
"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

"I understand that submittal of this application is for coverage under the State of Colorado General Permit for Stormwater Discharges Associated with Construction Activity for the entirety of the construction site/project described and applied for, until such time as the application is amended or the certification is transferred, inactivated, or expired."

_____ _____
Signature of Operator Date Signed

_____ _____
Name (printed) Title

_____ _____
Signature of Owner Date Signed

_____ _____
Name (printed) Title

Signature: The applicant must be either the owner and operator of the construction site. Refer to Part B of the instructions for additional information. The application must be signed by the applicant to be considered complete. In all cases, it shall be signed as follows:
(Regulation 61.4 (1ei)
a) In the case of corporations, by the responsible corporate officer is responsible for the overall operation of the facility from which the discharge described in the form originates
b) In the case of a partnership, by a general partner.
c) In the case of a sole proprietorship, by the proprietor.
d) In the case of a municipal, state, or other public facility, by either a principal executive officer, ranking elected official, (a principal executive officer has responsibility for the overall operation of the facility from which the discharge originates).

FORMER PERMITTEE used for transfers

Signature (Legally Responsible Party) _____ Date _____

Name (printed) _____ Title _____

Appendix B – Mile High Flood District Spec Sheets

Sediment Control Log (SCL) SC-2

Description

A sediment control log is a linear roll made of natural materials such as straw, coconut fiber, or compost. The most common type of sediment control log has straw filling and is often referred to as a "straw wattle." All sediment control logs are used as a sediment barrier to intercept sheet flow runoff from disturbed areas.





Photographs SCL-1 and SCL-2. Sediment control logs used as 1) a perimeter control around a soil stockpile; and, 2) as a "J-hook" perimeter control at the corner of a construction site.

Appropriate Uses

Sediment control logs can be used in the following applications to trap sediment:

- As perimeter control for stockpiles and the site.
- As part of inlet protection designs.
- As check dams in small drainage ditches. (Sediment control logs are not intended for use in channels with high flow velocities.)
- On disturbed slopes to shorten flow lengths (as an erosion control).
- As part of multi-layered perimeter control along a receiving water such as a stream, pond or wetland.

Sediment control logs work well in combination with other layers of erosion and sediment controls.

Design and Installation

Sediment control logs should be installed along the contour to avoid concentrating flows. The maximum allowable tributary drainage area per 100 lineal feet of sediment control log, installed along the contour, is approximately 0.25 acres with a disturbed slope length of up to 150 feet and a tributary slope gradient no steeper than 3:1. Longer and steeper slopes require additional measures. This recommendation only applies to sediment control logs installed along the contour. When installed for other uses, such as perimeter control, it should be installed in a way that will not produce concentrated flows. For example, a "J-hook" installation may be appropriate to force runoff to pond and evaporate or infiltrate in multiple areas rather than concentrate and cause erosive conditions parallel to the BMP.

Sediment Control Log	
Functions	
Erosion Control	Moderate
Sediment Control	Yes
Site/Material Management	No

Although sediment control logs initially allow runoff to flow through the BMP, they can quickly become a barrier and should be installed as if they are impermeable.

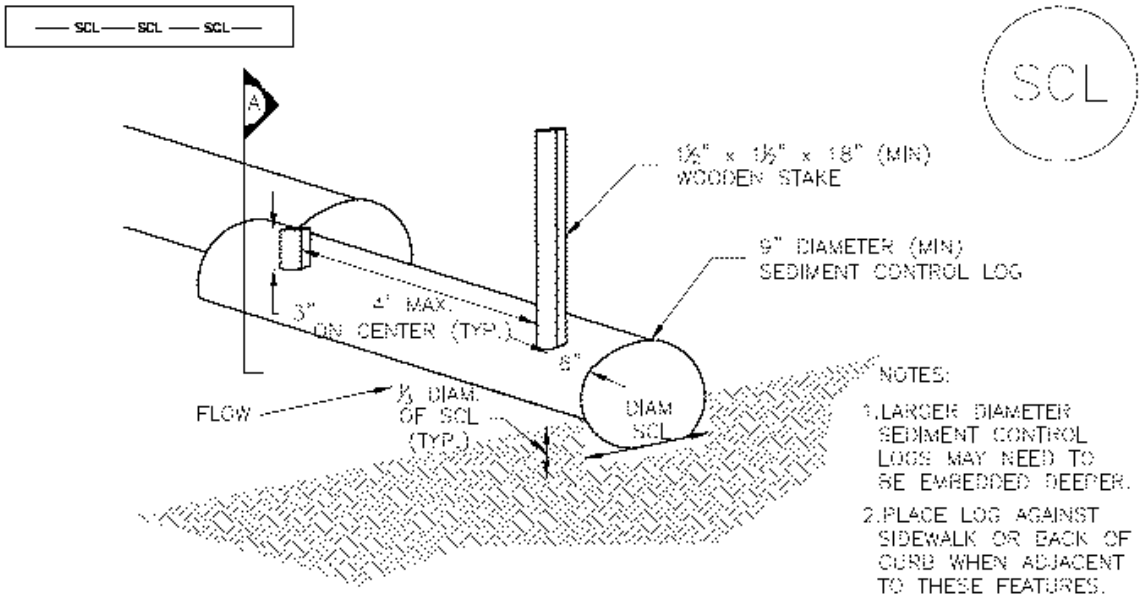
Design details and notes for sediment control logs are provided in the following details. Sediment logs must be properly installed per the detail to prevent undercutting, bypassing and displacement. When installed on slopes, sediment control logs should be installed along the contours (i.e., perpendicular to flow).

Improper installation can lead to poor performance. Be sure that sediment control logs are properly trenched (if lighter than 8 lb/foot), anchored and tightly jointed.

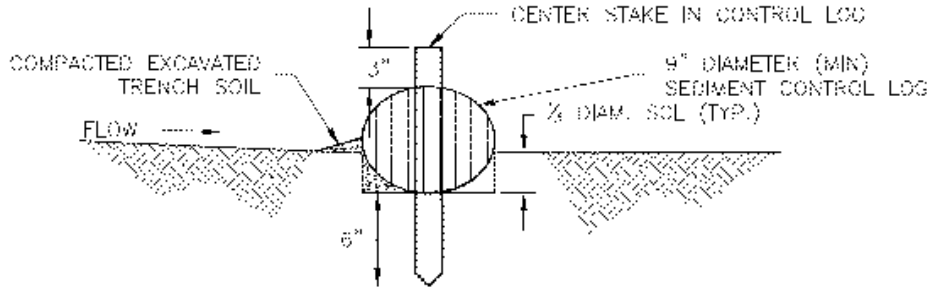
Maintenance and Removal

Be aware that sediment control logs will eventually degrade. Remove accumulated sediment before the depth is one-half the height of the sediment log and repair damage to the sediment log, typically by replacing the damaged section.

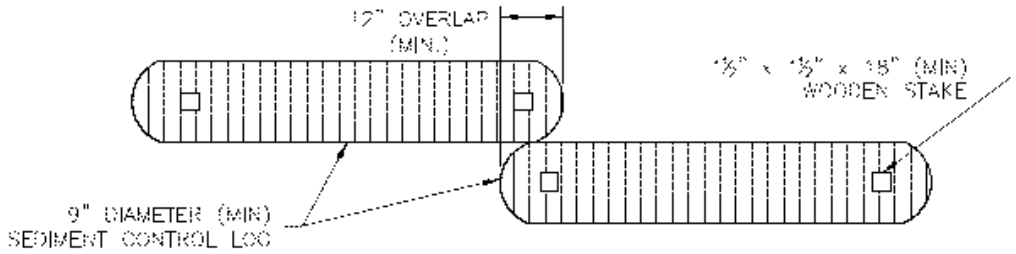
Once the upstream area is stabilized, remove and properly dispose of the logs. Areas disturbed beneath the logs may need to be seeded and mulched. Sediment control logs that are biodegradable may occasionally be left in place (e.g., when logs are used in conjunction with erosion control blankets as permanent slope breaks). However, removal of sediment control logs after final stabilization is typically appropriate when used in perimeter control, inlet protection and check dam applications. Compost from compost sediment control logs may be spread over the area and seeded as long as this does not cover newly established vegetation.



TRENCHED SEDIMENT CONTROL LOG

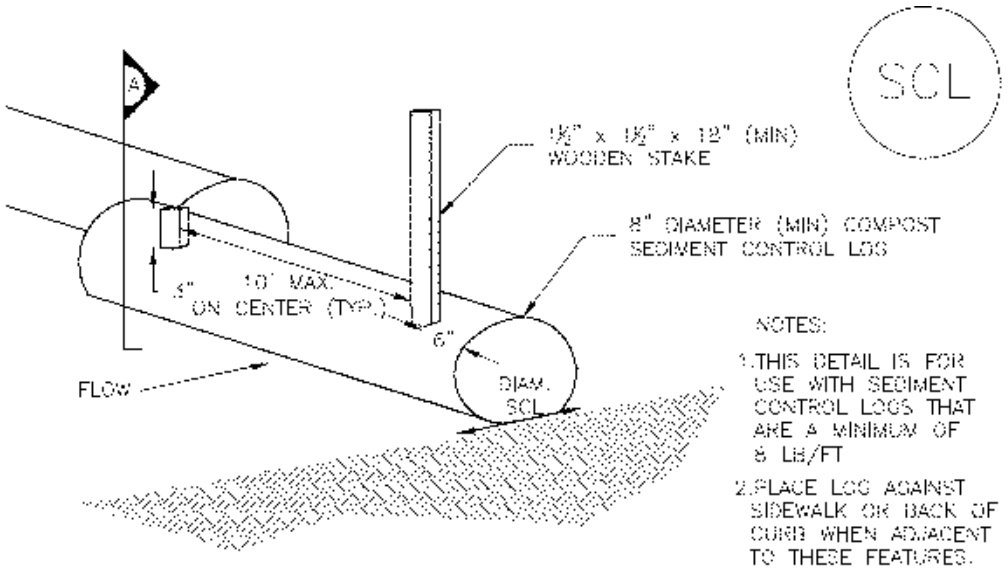


SECTION (A)
TRENCHED SEDIMENT CONTROL LOG

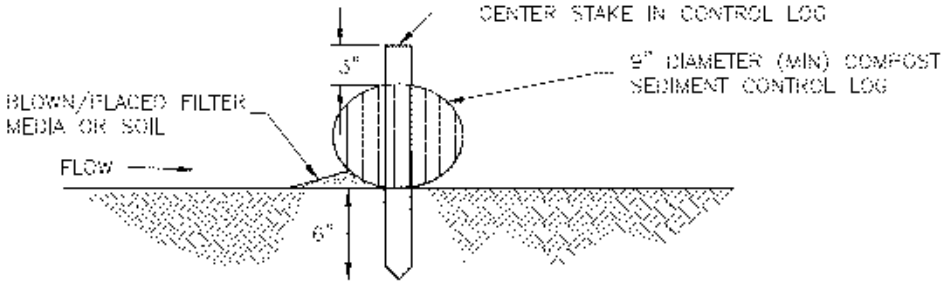


LOG JOINTS

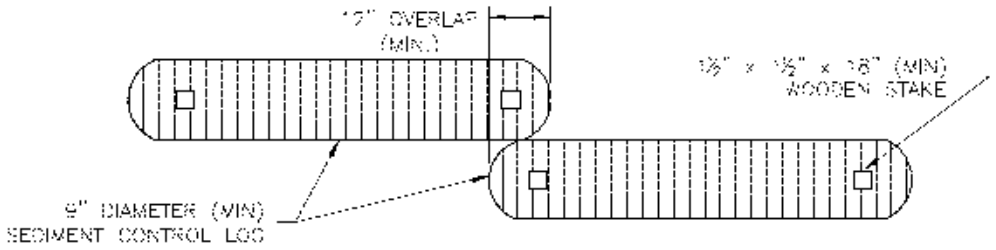
SCL–1. TRENCHED SEDIMENT CONTROL LOG



COMPOST SEDIMENT CONTROL LOG (WEIGHTED)

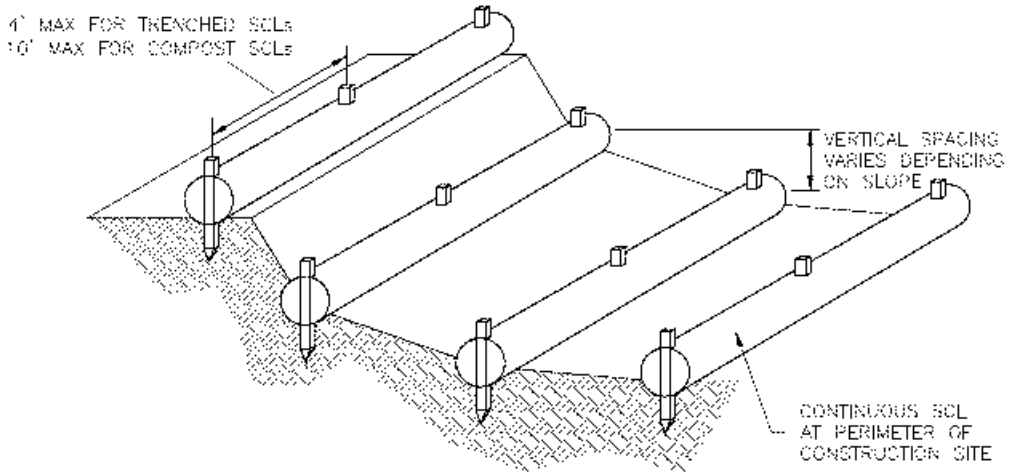


SECTION (A)
COMPOST SEDIMENT CONTROL LOG



LOG JOINTS

SCL–2. COMPOST SEDIMENT CONTROL LOG (WEIGHTED)



SCL–3. SEDIMENT CONTROL LOGS TO CONTROL SLOPE LENGTH

SEDIMENT CONTROL LOG INSTALLATION NOTES

1. SEE PLAN VIEW FOR LOCATION AND LENGTH OF SEDIMENT CONTROL LOGS.

2. SEDIMENT CONTROL LOGS THAT ACT AS A PERIMETER CONTROL SHALL BE INSTALLED PRIOR TO ANY UPGRADIENT LAND-DISTURBING ACTIVITIES.

3. SEDIMENT CONTROL LOGS SHALL CONSIST OF STRAW, COMPOST, EXCELSIOR OR COCONUT FIBER, AND SHALL BE FREE OF ANY NOXIOUS WEED SEEDS OR DEFECTS INCLUDING RIPS, HOLES AND OBVIOUS WEAR.

4. SEDIMENT CONTROL LOGS MAY BE USED AS SMALL CHECK DAMS IN DITCHES AND SWALES. HOWEVER, THEY SHOULD NOT BE USED IN PERENNIAL STREAMS.

5. IT IS RECOMMENDED THAT SEDIMENT CONTROL LOGS BE TRENCHED INTO THE GROUND TO A DEPTH OF APPROXIMATELY ⅓ OF THE DIAMETER OF THE LOG. IF TRENCHING TO THIS DEPTH IS NOT FEASIBLE AND/OR DESIRABLE (SHORT TERM INSTALLATION WITH DESIRE NOT TO DAMAGE LANDSCAPE) A LESSER TRENCHING DEPTH MAY BE ACCEPTABLE WITH MORE ROBUST STAKING. COMPOST LOGS THAT ARE 8 LB/FT DO NOT NEED TO BE TRENCHED.

6. THE UPHILL SIDE OF THE SEDIMENT CONTROL LOG SHALL BE BACKFILLED WITH SOIL OR FILTER MATERIAL THAT IS FREE OF ROCKS AND DEBRIS. THE SOIL SHALL BE TIGHTLY COMPACTED INTO THE SHAPE OF A RIGHT TRIANGLE USING A SHOVEL OR WEIGHTED LAWN ROLLER OR BLOWN IN PLACE.

7. FOLLOW MANUFACTURERS' GUIDANCE FOR STAKING. IF MANUFACTURERS' INSTRUCTIONS DO NOT SPECIFY SPACING, STAKES SHALL BE PLACED ON 4' CENTERS AND EMBEDDED A MINIMUM OF 6" INTO THE GROUND. 3" OF THE STAKE SHALL PROTRUDE FROM THE TOP OF THE LOG. STAKES THAT ARE BROKEN PRIOR TO INSTALLATION SHALL BE REPLACED. COMPOST LOGS SHOULD BE STAKED 10' ON CENTER.

SEDIMENT CONTROL LOG MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. SEDIMENT ACCUMULATED UPSTREAM OF SEDIMENT CONTROL LOG SHALL BE REMOVED AS NEEDED TO MAINTAIN FUNCTIONALITY OF THE BMP, TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY ½ OF THE HEIGHT OF THE SEDIMENT CONTROL LOG.

5. SEDIMENT CONTROL LOG SHALL BE REMOVED AT THE END OF CONSTRUCTION.COMPOST FROM COMPOST LOGS MAY BE LEFT IN PLACE AS LONG AS BAGS ARE REMOVED AND THE AREA SEEDED. IF DISTURBED AREAS EXIST AFTER REMOVAL, THEY SHALL BE COVERED WITH TOP SOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

(DETAILS ADAPTED FROM TOWN OF PARKER, COLORADO, JEFFERSON COUNTY, COLORADO, DOUGLAS COUNTY, COLORADO, AND CITY OF AURORA, COLORADO, NOT AVAILABLE IN AUTOCAD)

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

Surface Roughening (SR) EC-1

Description

Surface roughening is an erosion control practice that involves tracking, scarifying, imprinting, or tilling a disturbed area to provide temporary stabilization of disturbed areas. Surface roughening creates variations in the soil surface that help to minimize wind and water erosion. Depending on the technique used, surface roughening may also help establish conditions favorable to establishment of vegetation.



Photograph SR-1. Surface roughening via imprinting for temporary stabilization.

Appropriate Uses

Surface roughening can be used to provide temporary stabilization of disturbed areas, such as when revegetation cannot be immediately established due to seasonal planting limitations. Surface roughening is not a stand-alone BMP, and should be used in conjunction with other erosion and sediment controls.

Surface roughening is often implemented in conjunction with grading and is typically performed using heavy construction equipment to track the surface. Be aware that tracking with heavy equipment will also compact soils, which is not desirable in areas that will be revegetated. Scarifying, tilling, or ripping are better surface roughening techniques in locations where revegetation is planned. Roughening is not effective in very sandy soils and cannot be effectively performed in rocky soil.

Design and Installation

Typical design details for surfacing roughening on steep and mild slopes are provided in Details SR-1 and SR-2, respectively.

Surface roughening should be performed either after final grading or to temporarily stabilize an area during active construction that may be inactive for a short time period. Surface roughening should create depressions 2 to 6 inches deep and approximately 6 inches apart. The surface of exposed soil can be roughened by a number of techniques and equipment. Horizontal grooves (running parallel to the contours of the land) can be made using tracks from equipment treads, stair-step grading, ripping, or tilling.

Fill slopes can be constructed with a roughened surface. Cut slopes that have been smooth graded can be roughened as a subsequent operation. Roughening should follow along the contours of the slope. The tracks left by truck mounted equipment working perpendicular to the contour can leave acceptable horizontal depressions; however, the equipment will also compact the soil.

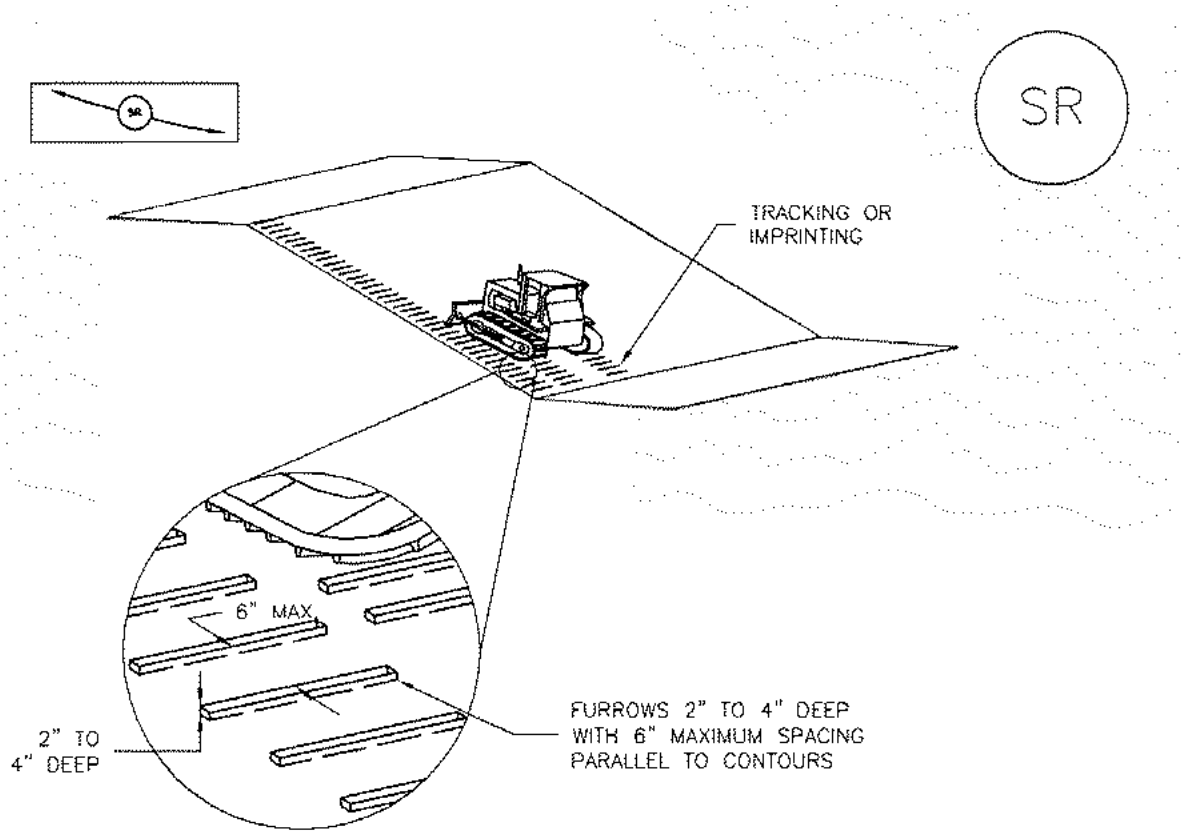
Surface Roughening	
Functions	
Erosion Control	Yes
Sediment Control	No
Site/Material Management	No

Maintenance and Removal

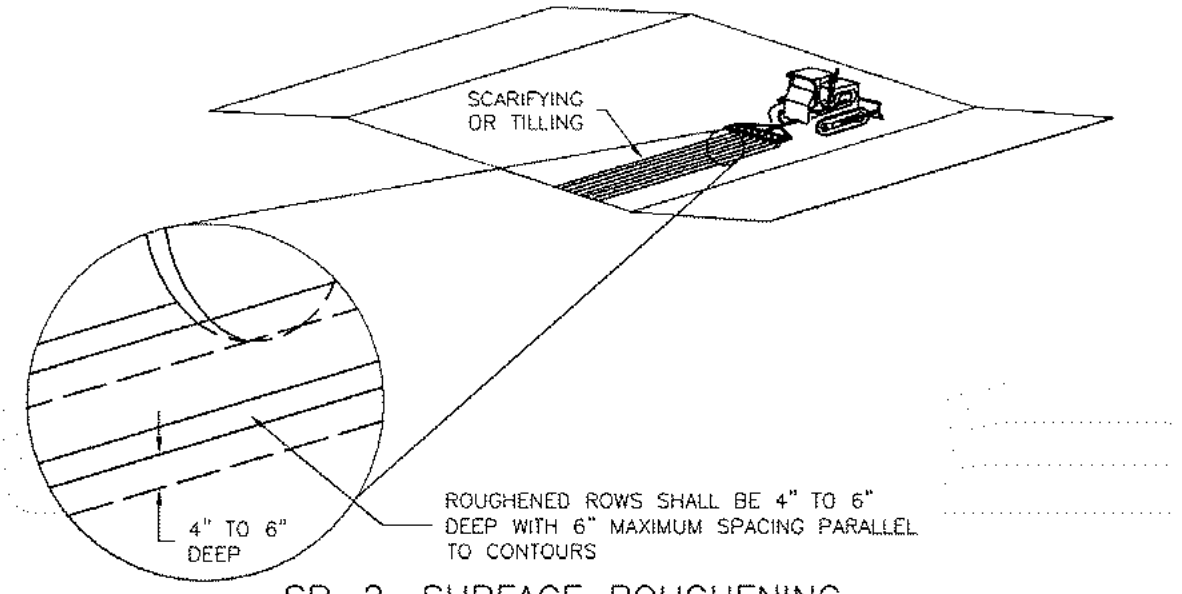
Care should be taken not to drive vehicles or equipment over areas that have been surface roughened. Tire tracks will smooth the roughened surface and may cause runoff to collect into rills and gullies.

Because surface roughening is only a temporary control, additional treatments may be necessary to maintain the soil surface in a roughened condition.

Areas should be inspected for signs of erosion. Surface roughening is a temporary measure, and will not provide long-term erosion control.



SR–1. SURFACE ROUGHENING
FOR STEEP SLOPES (3:1 OR STEEPER)



SR–2. SURFACE ROUGHENING
FOR LOW SLOPES (LESS THAN 3:1)

SURFACE ROUGHENING INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   -LOCATION(S) OF SURFACE ROUGHENING.

2. SURFACE ROUGHENING SHALL BE PROVIDED PROMPTLY AFTER COMPLETION OF FINISHED GRADING (FOR AREAS NOT RECEIVING TOPSOIL) OR PRIOR TO TOPSOIL PLACEMENT OR ANY FORECASTED RAIN EVENT.

3. AREAS WHERE BUILDING FOUNDATIONS, PAVEMENT, OR SOD WILL BE PLACED WITHOUT DELAY IN THE CONSTRUCTION SEQUENCE, SURFACE ROUGHENING IS NOT REQUIRED.

4. DISTURBED SURFACES SHALL BE ROUGHENED USING RIPPING OR TILLING EQUIPMENT ON THE CONTOUR OR TRACKING UP AND DOWN A SLOPE USING EQUIPMENT TREADS.

5. A FARMING DISK SHALL NOT BE USED FOR SURFACE ROUGHENING.

SURFACE ROUGHENING MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACE UPON DISCOVERY OF THE FAILURE.

4. VEHICLES AND EQUIPMENT SHALL NOT BE DRIVEN OVER AREAS THAT HAVE BEEN SURFACE ROUGHENED.

5. IN NON-TURF GRASS FINISHED AREAS, SEEDING AND MULCHING SHALL TAKE PLACE DIRECTLY OVER SURFACE ROUGHENED AREAS WITHOUT FIRST SMOOTHING OUT THE SURFACE.

6. IN AREAS NOT SEEDED AND MULCHED AFTER SURFACE ROUGHENING, SURFACES SHALL BE RE-ROUGHENED AS NECESSARY TO MAINTAIN GROOVE DEPTH AND SMOOTH OVER RILL EROSION.

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

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

Temporary Outlet Protection (TOP) EC-8

Description

Outlet protection helps to reduce erosion immediately downstream of a pipe, culvert, slope drain, rundown or other conveyance with concentrated, high-velocity flows. Typical outlet protection consists of riprap or rock aprons at the conveyance outlet.



Photograph TOP-1. Riprap outlet protection.

Appropriate Uses

Outlet protection should be used when a conveyance discharges onto a disturbed area where there is potential for accelerated erosion due to concentrated flow. Outlet protection should be provided where the velocity at the culvert outlet exceeds the maximum permissible velocity of the material in the receiving channel.

Note**:** This Fact Sheet and detail are for temporary outlet protection, outlets that are intended to be used for less than 2 years. For permanent, long-term outlet protection, see the *Major Drainage* chapter of Volume 1.

Design and Installation

Design outlet protection to handle runoff from the largest drainage area that may be contributing runoff during construction (the drainage area may change as a result of grading). Key in rock, around the entire perimeter of the apron, to a minimum depth of 6 inches for stability. Extend riprap to the height of the culvert or the normal flow depth of the downstream channel, whichever is less. Additional erosion control measures such as vegetative lining, turf reinforcement mat and/or other channel lining methods may be required downstream of the outlet protection if the channel is susceptible to erosion. See Design Detail OP-1 for additional information.

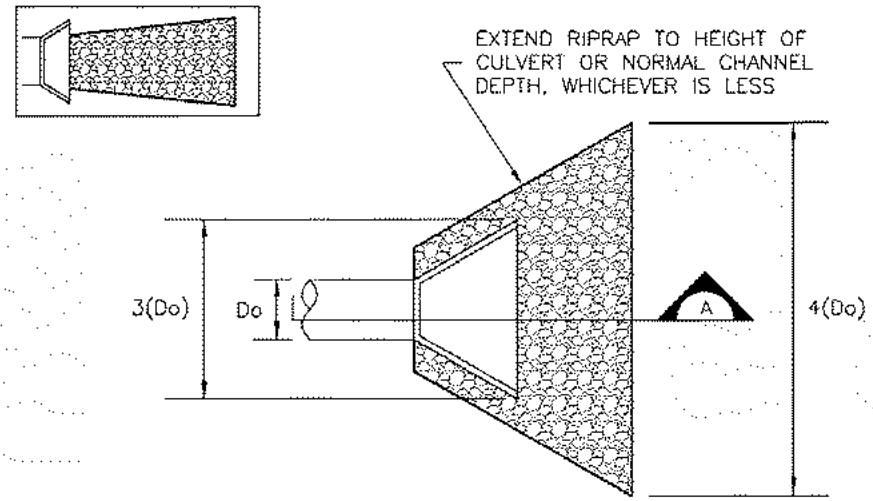
Maintenance and Removal

Inspect apron for damage and displaced rocks. If rocks are missing or significantly displaced, repair or replace as necessary. If rocks are continuously missing or displaced, consider increasing the size of the riprap or deeper keying of the perimeter.

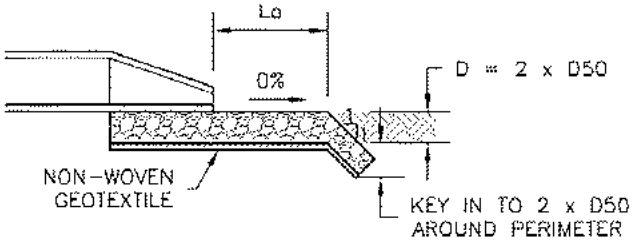
Remove sediment accumulated at the outlet before the outlet protection becomes buried and ineffective. When sediment accumulation is noted, check that upgradient BMPs, including inlet protection, are in effective operating condition.

Outlet protection may be removed once the pipe is no longer draining an upstream area, or once the downstream area has been sufficiently stabilized. If the drainage pipe is permanent, outlet protection can be left in place; however, permanent outlet protection should be designed and constructed in accordance with the requirements of the *Major Drainage* chapter of Volume 2.

Outlet Protection	
Functions	
Erosion Control	Yes
Sediment Control	Moderate
Site/Material Management	No



TEMPORARY OUTLET PROTECTION PLAN



SECTION A

TABLE OP-1. TEMPORARY OUTLET PROTECTION SIZING TABLE

PIPE DIAMETER, Do (INCHES)	DISCHARGE, Q (CFS)	APRON LENGTH, Lo (FT)	RIPRAP D50 DIAMETER MIN (INCHES)
8	2.5 5	5 10	4 6
12	5 10	10 13	4 6
18	10 20 30 40	10 16 23 26	6 9 12 16
24	30 40 50 60	16 26 26 30	9 9 12 16

OP-1. TEMPORARY OUTLET PROTECTION

TEMPORARY OUTLET PROTECTION INSTALLATION NOTES

1. SEE PLAN VIEW FOR
   –LOCATION OF OUTLET PROTECTION.
   –DIMENSIONS OF OUTLET PROTECTION.

2. DETAIL IS INTENDED FOR PIPES WITH SLOPE ≤ 10%. ADDITIONAL EVALUATION OF RIPRAP SIZING AND OUTLET PROTECTION DIMENSIONS REQUIRED FOR STEEPER SLOPES.

3. TEMPORARY OUTLET PROTECTION INFORMATION IS FOR OUTLETS INTENDED TO BE UTILIZED LESS THAN 2 YEARS.

TEMPORARY OUTLET PROTECTION INSPECTION AND MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

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

(DETAILS ADAPTED FROM AURORA, COLORADO AND PREVIOUS VERSION OF VOLUME 3, NOT AVAILABLE IN AUTOCAD)

Check Dams (CD) EC-12

Description

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



Photograph CD-1. Rock check dams in a roadside ditch. Photo courtesy of WWE.

Appropriate Uses

Use as a grade control for temporary drainage ditches or swales until final soil stabilization measures are established upstream and downstream. Check dams can be used on mild or moderately steep slopes. Check dams may be used under the following conditions:

- As temporary grade control facilities along waterways until final stabilization is established.
- Along permanent swales that need protection prior to installation of a non-erodible lining.
- Along temporary channels, ditches or swales that need protection where construction of a non-erodible lining is not practicable.
- Reinforced check dams should be used in areas subject to high flow velocities.

Design and Installation

Place check dams at regularly spaced intervals along the drainage swale or ditch. Check dams heights should allow for pools to develop upstream of each check dam, extending to the downstream toe of the check dam immediately upstream.

When rock is used for the check dam, place rock mechanically or by hand. Do not dump rocks into the drainage channel. Where multiple check dams are used, the top of the lower dam should be at the same elevation as the toe of the upper dam.

When reinforced check dams are used, install erosion control fabric under and around the check dam to prevent erosion on the upstream and downstream sides. Each section of the dam should be keyed in to reduce the potential for washout or undermining. A rock apron upstream and downstream of the dam may be necessary to further control erosion.

Check Dams	
Functions	
Erosion Control	Yes
Sediment Control	Moderate
Site/Material Management	No

Design details with notes are provided for the following types of check dams:

- Rock Check Dams (CD-1)
- Reinforced Check Dams (CD-2)

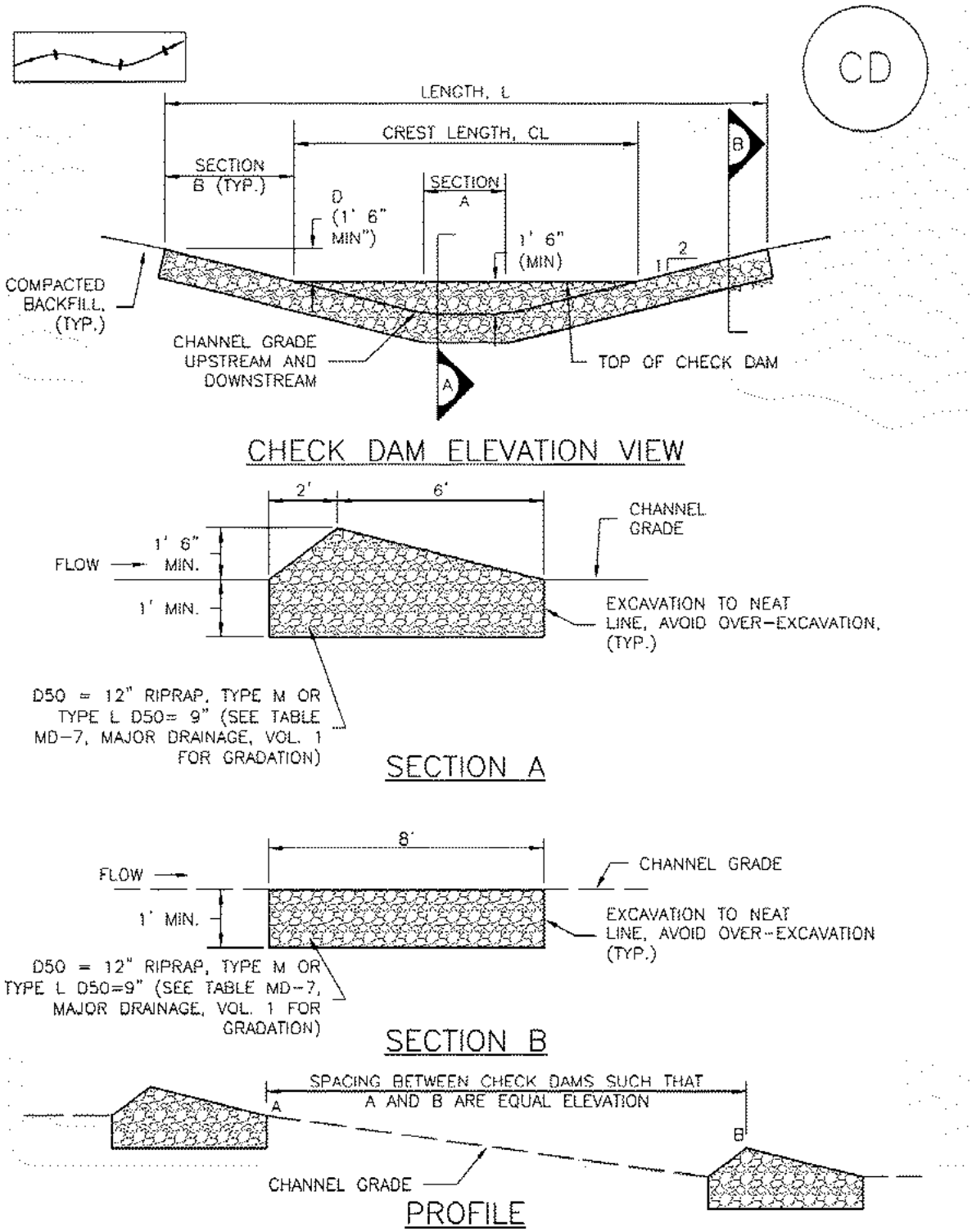
Sediment control logs may also be used as check dams; however, silt fence is not appropriate for use as a check dam. Many jurisdictions also prohibit or discourage use of straw bales for this purpose.

Maintenance and Removal

Replace missing rocks causing voids in the check dam. If gravel bags or sandbags are used, replace or repair torn or displaced bags.

Remove accumulated sediment, as needed to maintain BMP effectiveness, typically before the sediment depth upstream of the check dam is within ½ of the crest height. Remove accumulated sediment prior to mulching, seeding, or chemical soil stabilization. Removed sediment can be incorporated into the earthwork with approval from the Project Engineer, or disposed of at an alternate location in accordance with the standard specifications.

Check dams constructed in permanent swales should be removed when perennial grasses have become established, or immediately prior to installation of a non-erodible lining. All of the rock and accumulated sediment should be removed, and the area seeded and mulched, or otherwise stabilized.



CD-1. CHECK DAM

CHECK DAM INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   -LOCATION OF CHECK DAMS.
   -CHECK DAM TYPE (CHECK DAM OR REINFORCED CHECK DAM).
   -LENGTH (L), CREST LENGTH (CL), AND DEPTH (D).

2. CHECK DAMS INDICATED ON INITIAL SWMP SHALL BE INSTALLED AFTER CONSTRUCTION FENCE, BUT PRIOR TO ANY UPSTREAM LAND DISTURBING ACTIVITIES.

3. RIPRAP UTILIZED FOR CHECK DAMS SHOULD BE OF APPROPRIATE SIZE FOR THE APPLICATION. TYPICAL TYPES OF RIPRAP USED FOR CHECK DAMS ARE TYPE M (D50 12") OR TYPE L (D50 9").

4. RIPRAP PAD SHALL BE TRENCHED INTO THE GROUND A MINIMUM OF 1'.

5. THE ENDS OF THE CHECK DAM SHALL BE A MINIMUM OF 1' 6" HIGHER THAN THE CENTER OF THE CHECK DAM.

CHECK DAM MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

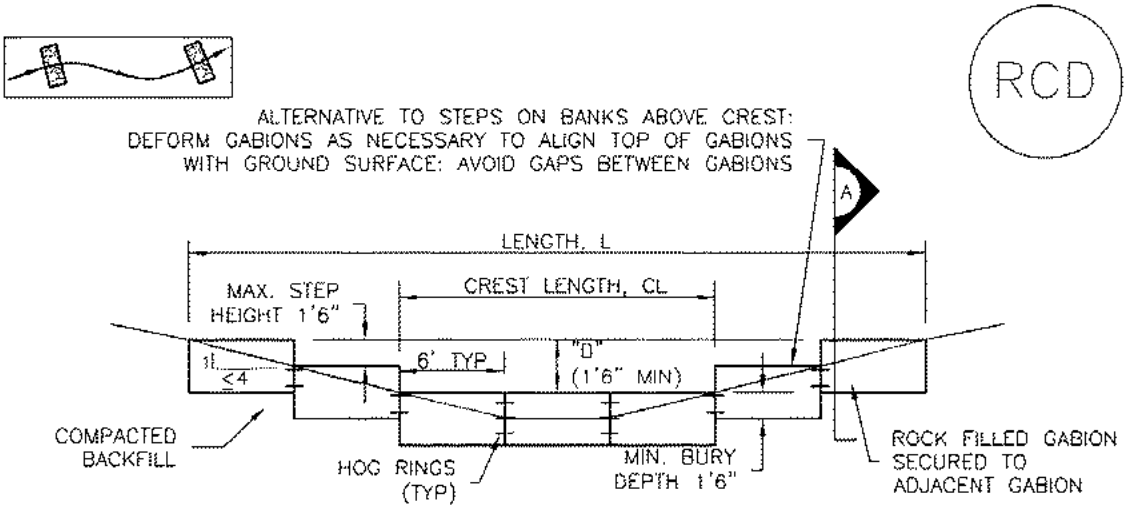
4. SEDIMENT ACCUMULATED UPSTREAM OF THE CHECK DAMS SHALL BE REMOVED WHEN THE SEDIMENT DEPTH IS WITHIN ½ OF THE HEIGHT OF THE CREST.

5. CHECK DAMS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION.

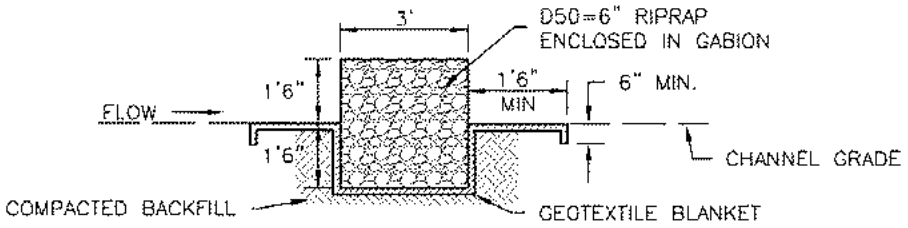
6. WHEN CHECK DAMS ARE REMOVED, EXCAVATIONS SHALL BE FILLED WITH SUITABLE COMPACTED BACKFILL. DISTURBED AREA SHALL BE SEEDED AND MULCHED AND COVERED WITH GEOTEXTILE OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

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

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



REINFORCED CHECK DAM ELEVATION VIEW



SECTION A

REINFORCED CHECK DAM INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   - –LOCATIONS OF CHECK DAMS.
   - –CHECK DAM TYPE (CHECK DAM OR REINFORCED CHECK DAM).
   - –LENGTH (L), CREST LENGTH (CL), AND DEPTH (D).

2. CHECK DAMS INDICATED ON THE SWMP SHALL BE INSTALLED PRIOR TO AN UPSTREAM LAND–DISTURBING ACTIVITIES.

3. REINFORCED CHECK DAMS, GABIONS SHALL HAVE GALVANIZED TWISTED WIRE NETTING WITH A MAXIMUM OPENING DIMENSION OF 4½" AND A MINIMUM WIRE THICKNESS OF 0.10". WIRE "HOG RINGS" AT 4' SPACING OR OTHER APPROVED MEANS SHALL BE USED AT ALL GABION SEAMS AND TO SECURE THE GABION TO THE ADJACENT SECTION.

4. THE CHECK DAM SHALL BE TRENCHED INTO THE GROUND A MINIMUM OF 1' 6".

5. GEOTEXTILE BLANKET SHALL BE PLACED IN THE REINFORCED CHECK DAM TRENCH EXTENDING A MINIMUM OF 1' 6" ON BOTH THE UPSTREAM AND DOWNSTREAM SIDES OF THE REINFORCED CHECK DAM.

CD–2. REINFORCED CHECK DAM

REINFORCED CHECK DAM MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. SEDIMENT ACCUMULATED UPSTREAM OF REINFORCED CHECK DAMS SHALL BE REMOVED AS NEEDED TO MAINTAIN THE EFFECTIVENESS OF BMP, TYPICALLY WHEN THE UPSTREAM SEDIMENT DEPTH IS WITHIN ½ THE HEIGHT OF THE CREST.

5. REPAIR OR REPLACE REINFORCED CHECK DAMS WHEN THERE ARE SIGNS OF DAMAGE SUCH AS HOLES IN THE GABION OR UNDERCUTTING.

6. REINFORCED CHECK DAMS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION.

7. WHEN REINFORCED CHECK DAMS ARE REMOVED, ALL DISTURBED AREAS SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED, AND COVERED WITH A GEOTEXTILE BLANKET, OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION.

(DETAIL ADAPTED FROM DOUGLAS COUNTY, COLORADO AND CITY OF AURORA, COLORADO, NOT AVAILABLE IN AUTOCAD)

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

Concrete Washout Area (CWA) MM-1

Description

Concrete waste management involves designating and properly managing a specific area of the construction site as a concrete washout area. A concrete washout area can be created using one of several approaches designed to receive wash water from washing of tools and concrete mixer chutes, liquid concrete waste from dump trucks, mobile batch mixers, or pump trucks. Three basic approaches are available: excavation of a pit in the ground, use of an above ground storage area, or use of prefabricated haul-away concrete washout containers. Surface discharges of concrete washout water from construction sites are prohibited.



Photograph CWA-1. Example of concrete washout area. Note gravel tracking pad for access and sign.

Appropriate Uses

Concrete washout areas must be designated on all sites that will generate concrete wash water or liquid concrete waste from onsite concrete mixing or concrete delivery.

Because pH is a pollutant of concern for washout activities, when unlined pits are used for concrete washout, the soil must have adequate buffering capacity to result in protection of state groundwater standards; otherwise, a liner/containment must be used. The following management practices are recommended to prevent an impact from unlined pits to groundwater:

- The use of the washout site should be temporary (less than 1 year), and
- The washout site should be not be located in an area where shallow groundwater may be present, such as near natural drainages, springs, or wetlands.

Design and Installation

Concrete washout activities must be conducted in a manner that does not contribute pollutants to surface waters or stormwater runoff. Concrete washout areas may be lined or unlined excavated pits in the ground, commercially manufactured prefabricated washout containers, or aboveground holding areas constructed of berms, sandbags or straw bales with a plastic liner.

Although unlined washout areas may be used, lined pits may be required to protect groundwater under certain conditions.

Do not locate an unlined washout area within 400 feet of any natural drainage pathway or waterbody or within 1,000 feet of any wells or drinking water sources. Even for lined concrete washouts, it is advisable to locate the facility away from waterbodies and drainage paths. If site constraints make these

Concrete Washout Area	
Functions	
Erosion Control	No
Sediment Control	No
Site/Material Management	Yes

setbacks infeasible or if highly permeable soils exist in the area, then the pit must be installed with an impermeable liner (16 mil minimum thickness) or surface storage alternatives using prefabricated concrete washout devices or a lined aboveground storage area should be used.

Design details with notes are provided in Detail CWA-1 for pits and CWA-2 for aboveground storage areas. Pre-fabricated concrete washout container information can be obtained from vendors.

Maintenance and Removal

A key consideration for concrete washout areas is to ensure that adequate signage is in place identifying the location of the washout area. Part of inspecting and maintaining washout areas is ensuring that adequate signage is provided and in good repair and that the washout area is being used, as opposed to washout in non-designated areas of the site.

Remove concrete waste in the washout area, as needed to maintain BMP function (typically when filled to about two-thirds of its capacity). Collect concrete waste and deliver offsite to a designated disposal location.

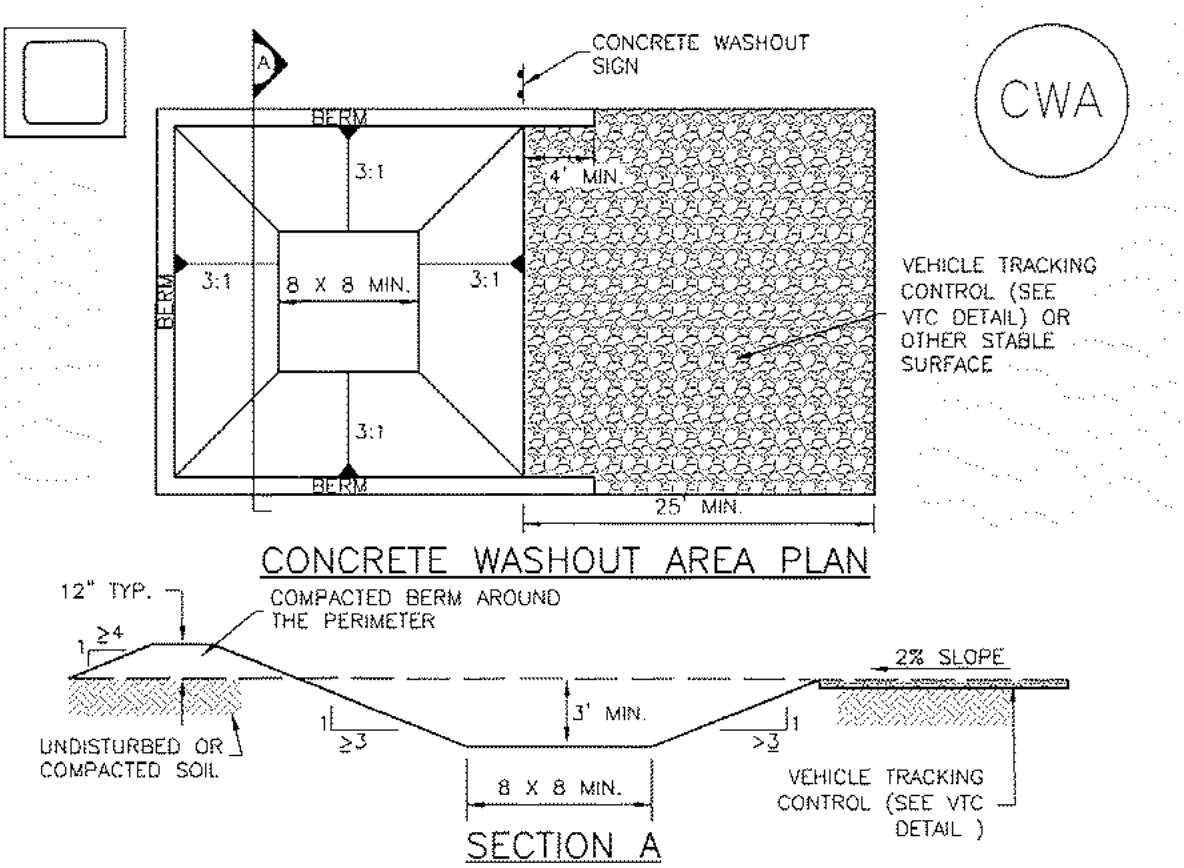
Upon termination of use of the washout site, accumulated solid waste, including concrete waste and any contaminated soils, must be removed from the site to prevent on-site disposal of solid waste. If the wash water is allowed to evaporate and the concrete hardens, it may be recycled.



Photograph CWA-2. Prefabricated concrete washout. Photo courtesy of CDOT.



Photograph CWA-3. Earthen concrete washout. Photo courtesy of CDOT.



CWA–1. CONCRETE WASHOUT AREA

CWA INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   –CWA INSTALLATION LOCATION.

2. DO NOT LOCATE AN UNLINED CWA WITHIN 400' OF ANY NATURAL DRAINAGE PATHWAY OR WATERBODY. DO NOT LOCATE WITHIN 1,000' OF ANY WELLS OR DRINKING WATER SOURCES. IF SITE CONSTRAINTS MAKE THIS INFEASIBLE, OR IF HIGHLY PERMEABLE SOILS EXIST ON SITE, THE CWA MUST BE INSTALLED WITH AN IMPERMEABLE LINER (16 MIL MIN. THICKNESS) OR SURFACE STORAGE ALTERNATIVES USING PREFABRICATED CONCRETE WASHOUT DEVICES OR A LINED ABOVE GROUND STORAGE ARE SHOULD BE USED.

3. THE CWA SHALL BE INSTALLED PRIOR TO CONCRETE PLACEMENT ON SITE.

4. CWA SHALL INCLUDE A FLAT SUBSURFACE PIT THAT IS AT LEAST 8' BY 8' SLOPES LEADING OUT OF THE SUBSURFACE PIT SHALL BE 3:1 OR FLATTER. THE PIT SHALL BE AT LEAST 3' DEEP.

5. BERM SURROUNDING SIDES AND BACK OF THE CWA SHALL HAVE MINIMUM HEIGHT OF 1'.

6. VEHICLE TRACKING PAD SHALL BE SLOPED 2% TOWARDS THE CWA.

7. SIGNS SHALL BE PLACED AT THE CONSTRUCTION ENTRANCE, AT THE CWA, AND ELSEWHERE AS NECESSARY TO CLEARLY INDICATE THE LOCATION OF THE CWA TO OPERATORS OF CONCRETE TRUCKS AND PUMP RIGS.

8. USE EXCAVATED MATERIAL FOR PERIMETER BERM CONSTRUCTION.

CWA MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. THE CWA SHALL BE REPAIRED, CLEANED, OR ENLARGED AS NECESSARY TO MAINTAIN CAPACITY FOR CONCRETE WASTE. CONCRETE MATERIALS, ACCUMULATED IN PIT, SHALL BE REMOVED ONCE THE MATERIALS HAVE REACHED A DEPTH OF 2'.

5. 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.

6. THE CWA SHALL REMAIN IN PLACE UNTIL ALL CONCRETE FOR THE PROJECT IS PLACED.

7. WHEN THE CWA IS REMOVED, COVER THE DISTURBED AREA WITH TOP SOIL, SEED AND MULCH OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

(DETAIL ADAPTED FROM DOUGLAS COUNTY, COLORADO AND THE CITY OF PARKER, COLORADO, NOT AVAILABLE IN AUTOCAD).

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

Stockpile Management (SP) MM-2

Description

Stockpile management includes measures to minimize erosion and sediment transport from soil stockpiles.

Appropriate Uses

Stockpile management should be used when soils or other erodible materials are stored at the construction site. Special attention should be given to stockpiles in close proximity to natural or manmade storm systems.



Photograph SP-1. A topsoil stockpile that has been partially revegetated and is protected by silt fence perimeter control.

Design and Installation

Locate stockpiles away from all drainage system components including storm sewer inlets. Where practical, choose stockpile locations that that will remain undisturbed for the longest period of time as the phases of construction progress. Place sediment control BMPs around the perimeter of the stockpile, such as sediment control logs, rock socks, silt fence, straw bales and sand bags. See Detail SP-1 for guidance on proper establishment of perimeter controls around a stockpile. For stockpiles in active use, provide a stabilized designated access point on the upgradient side of the stockpile.

Stabilize the stockpile surface with surface roughening, temporary seeding and mulching, erosion control blankets, or soil binders. Soils stockpiled for an extended period (typically for more than 60 days) should be seeded and mulched with a temporary grass cover once the stockpile is placed (typically within 14 days). Use of mulch only or a soil binder is acceptable if the stockpile will be in place for a more limited time period (typically 30-60 days). Timeframes for stabilization of stockpiles noted in this fact sheet are "typical" guidelines. Check permit requirements for specific federal, state, and/or local requirements that may be more prescriptive.

Stockpiles should not be placed in streets or paved areas unless no other practical alternative exists. See the Stabilized Staging Area Fact Sheet for guidance when staging in roadways is unavoidable due to space or right-of-way constraints. For paved areas, rock socks must be used for perimeter control and all inlets with the potential to receive sediment from the stockpile (even from vehicle tracking) must be protected.

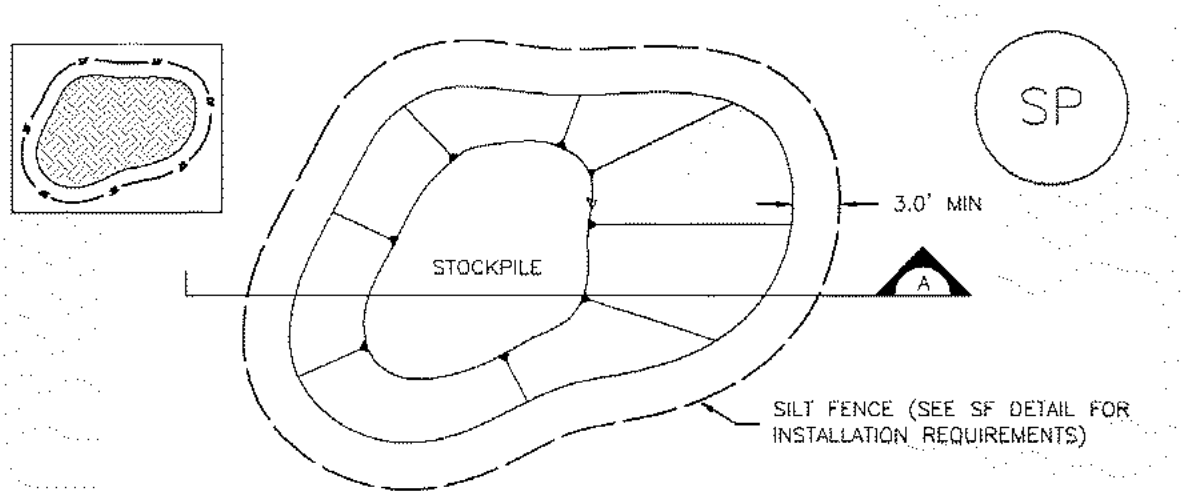
Maintenance and Removal

Inspect perimeter controls and inlet protection in accordance with their respective BMP Fact Sheets. Where seeding, mulch and/or soil binders are used, reseeding or reapplication of soil binder may be necessary.

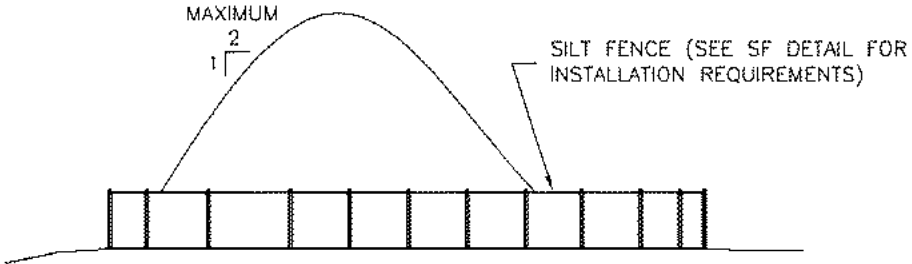
When temporary removal of a perimeter BMP is necessary to access a stockpile, ensure BMPs are reinstalled in accordance with their respective design detail section.

Stockpile Management	
Functions	
Erosion Control	Yes
Sediment Control	Yes
Site/Material Management	Yes

When the stockpile is no longer needed, properly dispose of excess materials and revegetate or otherwise stabilize the ground surface where the stockpile was located.



STOCKPILE PROTECTION PLAN



SECTION A

SP–1. STOCKPILE PROTECTION

STOCKPILE PROTECTION INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   -LOCATION OF STOCKPILES.
   -TYPE OF STOCKPILE PROTECTION.

2. INSTALL PERIMETER CONTROLS IN ACCORDANCE WITH THEIR RESPECTIVE DESIGN DETAILS. SILT FENCE IS SHOWN IN THE STOCKPILE PROTECTION DETAILS; HOWEVER, OTHER TYPES OF PERIMETER CONTROLS INCLUDING SEDIMENT CONTROL LOGS OR ROCK SOCKS MAY BE SUITABLE IN SOME CIRCUMSTANCES. CONSIDERATIONS FOR DETERMINING THE APPROPRIATE TYPE OF PERIMETER CONTROL FOR A STOCKPILE INCLUDE WHETHER THE STOCKPILE IS LOCATED ON A PERVIOUS OR IMPERVIOUS SURFACE, THE RELATIVE HEIGHTS OF THE PERIMETER CONTROL AND STOCKPILE, THE ABILITY OF THE PERIMETER CONTROL TO CONTAIN THE STOCKPILE WITHOUT FAILING IN THE EVENT THAT MATERIAL FROM THE STOCKPILE SHIFTS OR SLUMPS AGAINST THE PERIMETER, AND OTHER FACTORS.

3. STABILIZE THE STOCKPILE SURFACE WITH SURFACE ROUGHENING, TEMPORARY SEEDING AND MULCHING, EROSION CONTROL BLANKETS, OR SOIL BINDERS. SOILS STOCKPILED FOR AN EXTENDED PERIOD (TYPICALLY FOR MORE THAN 60 DAYS) SHOULD BE SEEDED AND MULCHED WITH A TEMPORARY GRASS COVER ONCE THE STOCKPILE IS PLACED (TYPICALLY WITHIN 14 DAYS). USE OF MULCH ONLY OR A SOIL BINDER IS ACCEPTABLE IF THE STOCKPILE WILL BE IN PLACE FOR A MORE LIMITED TIME PERIOD (TYPICALLY 30–60 DAYS).

4. FOR TEMPORARY STOCKPILES ON THE INTERIOR PORTION OF A CONSTRUCTION SITE, WHERE OTHER DOWNGRADIENT CONTROLS, INCLUDING PERIMETER CONTROL, ARE IN PLACE, STOCKPILE PERIMETER CONTROLS MAY NOT BE REQUIRED.

STOCKPILE PROTECTION MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

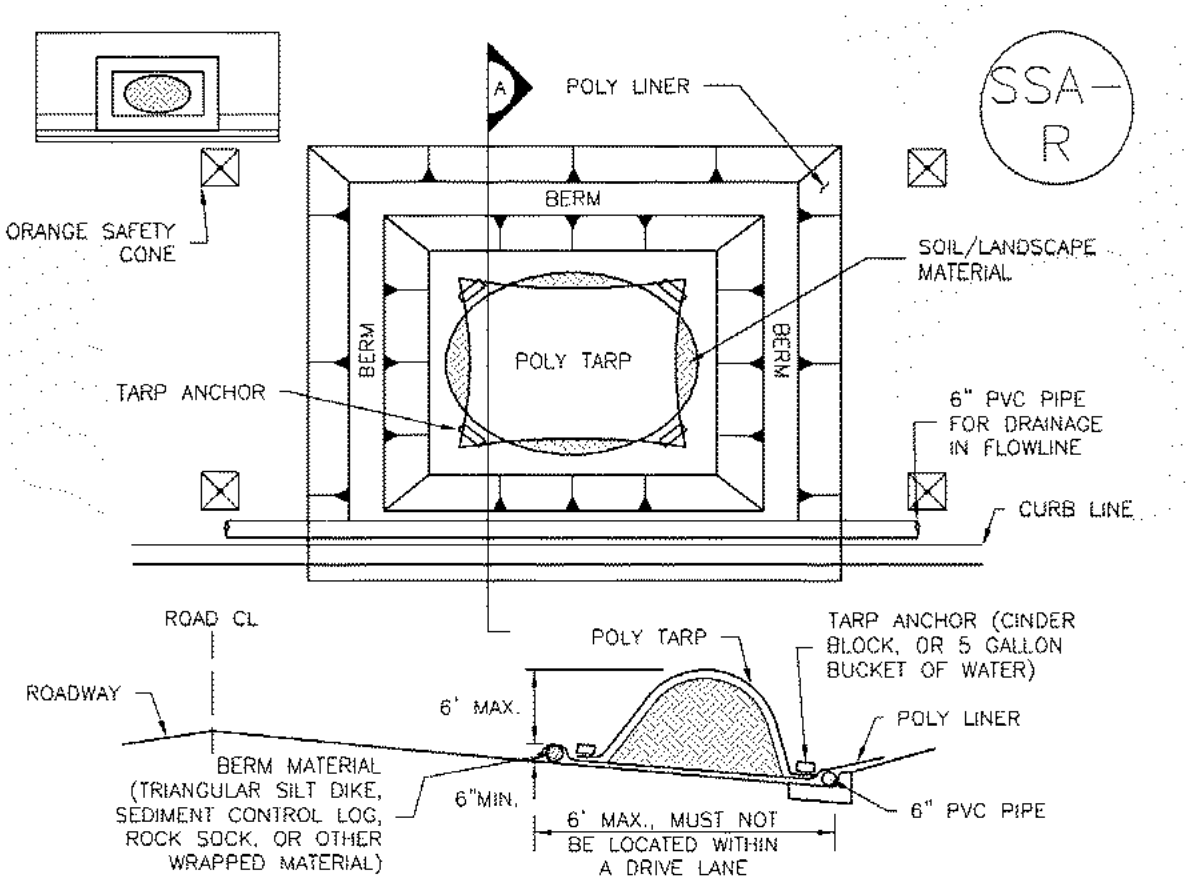
STOCKPILE PROTECTION MAINTENANCE NOTES

4. IF PERIMETER PROTECTION MUST BE MOVED TO ACCESS SOIL STOCKPILE, REPLACE PERIMETER CONTROLS BY THE END OF THE WORKDAY.

5. STOCKPILE PERIMETER CONTROLS CAN BE REMOVED ONCE ALL THE MATERIAL FROM THE STOCKPILE HAS BEEN USED.

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

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



SP–2. MATERIALS STAGING IN ROADWAY

MATERIALS STAGING IN ROADWAYS INSTALLATION NOTES

1. SEE PLAN VIEW FOR
   –LOCATION OF MATERIAL STAGING AREA(S).
   –CONTRACTOR MAY ADJUST LOCATION AND SIZE OF STAGING AREA WITH APPROVAL FROM THE LOCAL JURISDICTION.

2. FEATURE MUST BE INSTALLED PRIOR TO EXCAVATION, EARTHWORK OR DELIVERY OF MATERIALS.

3. MATERIALS MUST BE STATIONED ON THE POLY LINER. ANY INCIDENTAL MATERIALS DEPOSITED ON PAVED SECTION OR ALONG CURB LINE MUST BE CLEANED UP PROMPTLY.

4. POLY LINER AND TARP COVER SHOULD BE OF SIGNIFICANT THICKNESS TO PREVENT DAMAGE OR LOSS OF INTEGRITY.

5. SAND BAGS MAY BE SUBSTITUTED TO ANCHOR THE COVER TARP OR PROVIDE BERMING UNDER THE BASE LINER.

6. FEATURE IS NOT INTENDED FOR USE WITH WET MATERIAL THAT WILL BE DRAINING AND/OR SPREADING OUT ON THE POLY LINER OR FOR DEMOLITION MATERIALS.

7. THIS FEATURE CAN BE USED FOR:
   –UTILITY REPAIRS.
   –WHEN OTHER STAGING LOCATIONS AND OPTIONS ARE LIMITED.
   –OTHER LIMITED APPLICATION AND SHORT DURATION STAGING.

MATERIALS STAGING IN ROADWAY MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. INSPECT PVC PIPE ALONG CURB LINE FOR CLOGGING AND DEBRIS. REMOVE OBSTRUCTIONS PROMPTLY.

5. CLEAN MATERIAL FROM PAVED SURFACES BY SWEEPING OR VACUUMING.

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

(DETAILS ADAPTED FROM AURORA, COLORADO)

Silt Fence (SF) SC-1

Description

A silt fence is a woven geotextile fabric attached to wooden posts and trenched into the ground. It is designed as a sediment barrier to intercept sheet flow runoff from disturbed areas.



Photograph SF-1. Silt fence creates a sediment barrier, forcing sheet flow runoff to evaporate or infiltrate.

Appropriate Uses

A silt fence can be used where runoff is conveyed from a disturbed area as sheet flow. Silt fence is not designed to receive concentrated flow or to be used as a filter fabric. Typical uses include:

- Down slope of a disturbed area to accept sheet flow.
- Along the perimeter of a receiving water such as a stream, pond or wetland.
- At the perimeter of a construction site.

Design and Installation

Silt fence should be installed along the contour of slopes so that it intercepts sheet flow. The maximum recommended tributary drainage area per 100 lineal feet of silt fence, installed along the contour, is approximately 0.25 acres with a disturbed slope length of up to 150 feet and a tributary slope gradient no steeper than 3:1. Longer and steeper slopes require additional measures. This recommendation only applies to silt fence installed along the contour. Silt fence installed for other uses, such as perimeter control, should be installed in a way that will not produce concentrated flows. For example, a "J-hook" installation may be appropriate to force runoff to pond and evaporate or infiltrate in multiple areas rather than concentrate and cause erosive conditions parallel to the silt fence.

See Detail SF-1 for proper silt fence installation, which involves proper trenching, staking, securing the fabric to the stakes, and backfilling the silt fence. Properly installed silt fence should not be easily pulled out by hand and there should be no gaps between the ground and the fabric.

Silt fence must meet the minimum allowable strength requirements, depth of installation requirement, and other specifications in the design details. Improper installation of silt fence is a common reason for silt fence failure; however, when properly installed and used for the appropriate purposes, it can be highly effective.

Silt Fence	
Functions	
Erosion Control	No
Sediment Control	Yes
Site/Material Management	No

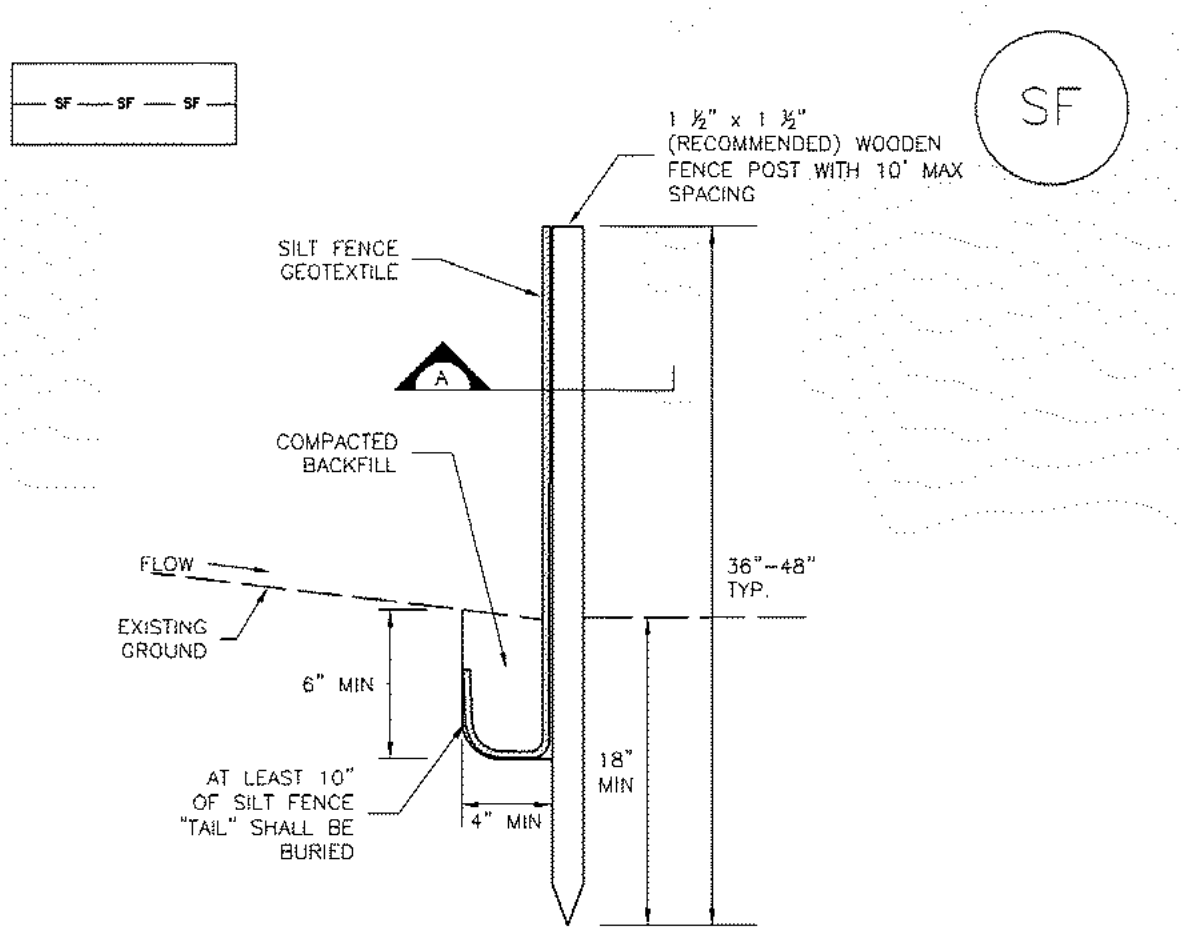
Maintenance and Removal

Inspection of silt fence includes observing the material for tears or holes and checking for slumping fence and undercut areas bypassing flows. Repair of silt fence typically involves replacing the damaged section with a new section. Sediment accumulated behind silt fence should be removed, as needed to maintain BMP effectiveness, typically before it reaches a depth of 6 inches.

Silt fence may be removed when the upstream area has reached final stabilization.



Photograph SF-2. When silt fence is not installed along the contour, a "J-hook" installation may be appropriate to ensure that the BMP does not create concentrated flow parallel to the silt fence. Photo courtesy of Tom Gore.



SF–1. SILT FENCE

SILT FENCE INSTALLATION NOTES

1. SILT FENCE MUST BE PLACED AWAY FROM THE TOE OF THE SLOPE TO ALLOW FOR WATER PONDING. SILT FENCE AT THE TOE OF A SLOPE SHOULD BE INSTALLED IN A FLAT LOCATION AT LEAST SEVERAL FEET (2–5 FT) FROM THE TOE OF THE SLOPE TO ALLOW ROOM FOR PONDING AND DEPOSITION.

2. A UNIFORM 6" X 4" ANCHOR TRENCH SHALL BE EXCAVATED USING TRENCHER OR SILT FENCE INSTALLATION DEVICE. NO ROAD GRADERS, BACKHOES, OR SIMILAR EQUIPMENT SHALL BE USED.

3. COMPACT ANCHOR TRENCH BY HAND WITH A "JUMPING JACK" OR BY WHEEL ROLLING. COMPACTION SHALL BE SUCH THAT SILT FENCE RESISTS BEING PULLED OUT OF ANCHOR TRENCH BY HAND.

4. SILT FENCE SHALL BE PULLED TIGHT AS IT IS ANCHORED TO THE STAKES. THERE SHOULD BE NO NOTICEABLE SAG BETWEEN STAKES AFTER IT HAS BEEN ANCHORED TO THE STAKES.

5. SILT FENCE FABRIC SHALL BE ANCHORED TO THE STAKES USING 1" HEAVY DUTY STAPLES OR NAILS WITH 1" HEADS. STAPLES AND NAILS SHOULD BE PLACED 3" ALONG THE FABRIC DOWN THE STAKE.

6. AT THE END OF A RUN OF SILT FENCE ALONG A CONTOUR, THE SILT FENCE SHOULD BE TURNED PERPENDICULAR TO THE CONTOUR TO CREATE A "J-HOOK." THE "J-HOOK" EXTENDING PERPENDICULAR TO THE CONTOUR SHOULD BE OF SUFFICIENT LENGTH TO KEEP RUNOFF FROM FLOWING AROUND THE END OF THE SILT FENCE (TYPICALLY 10' – 20').

7. SILT FENCE SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.

SILT FENCE MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. SEDIMENT ACCUMULATED UPSTREAM OF THE SILT FENCE SHALL BE REMOVED AS NEEDED TO MAINTAIN THE FUNCTIONALITY OF THE BMP, TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY 6".

5. REPAIR OR REPLACE SILT FENCE WHEN THERE ARE SIGNS OF WEAR, SUCH AS SAGGING, TEARING, OR COLLAPSE.

6. SILT FENCE IS TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION, OR IS REPLACED BY AN EQUIVALENT PERIMETER SEDIMENT CONTROL BMP.

7. WHEN SILT FENCE IS REMOVED, ALL DISTURBED AREAS SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION.

(DETAIL ADAPTED FROM TOWN OF PARKER, COLORADO AND CITY OF AURORA, NOT AVAILABLE IN AUTOCAD)

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

Rock Sock (RS) SC-5

Description

A rock sock is constructed of gravel that has been wrapped by wire mesh or a geotextile to form an elongated cylindrical filter. Rock socks are typically used either as a perimeter control or as part of inlet protection. When placed at angles in the curb line, rock socks are typically referred to as curb socks. Rock socks are intended to trap sediment from stormwater runoff that flows onto roadways as a result of construction activities.



Photograph RS-1. Rock socks placed at regular intervals in a curb line can help reduce sediment loading to storm sewer inlets. Rock socks can also be used as perimeter controls.

Appropriate Uses

Rock socks can be used at the perimeter of a disturbed area to control localized sediment loading. A benefit of rock socks as opposed to other perimeter controls is that they do not have to be trenched or staked into the ground; therefore, they are often used on roadway construction projects where paved surfaces are present.

Use rock socks in inlet protection applications when the construction of a roadway is substantially complete and the roadway has been directly connected to a receiving storm system.

Design and Installation

When rock socks are used as perimeter controls, the maximum recommended tributary drainage area per 100 lineal feet of rock socks is approximately 0.25 acres with disturbed slope length of up to 150 feet and a tributary slope gradient no steeper than 3:1. A rock sock design detail and notes are provided in Detail RS-1. Also see the Inlet Protection Fact Sheet for design and installation guidance when rock socks are used for inlet protection and in the curb line.

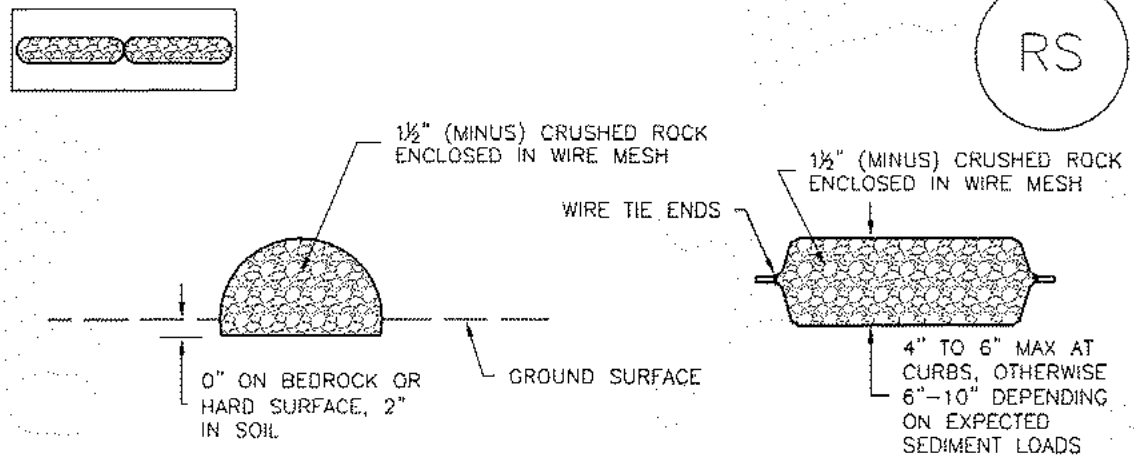
When placed in the gutter adjacent to a curb, rock socks should protrude no more than two feet from the curb in order for traffic to pass safely. If located in a high traffic area, place construction markers to alert drivers and street maintenance workers of their presence.

Maintenance and Removal

Rock socks are susceptible to displacement and breaking due to vehicle traffic. Inspect rock socks for damage and repair or replace as necessary. Remove sediment by sweeping or vacuuming as needed to maintain the functionality of the BMP, typically when sediment has accumulated behind the rock sock to one-half of the sock's height.

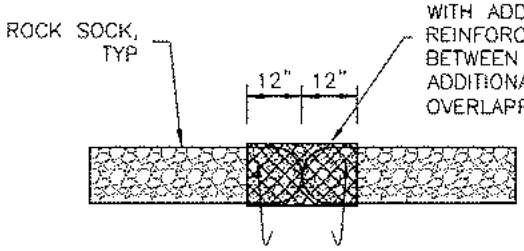
Once upstream stabilization is complete, rock socks and accumulated sediment should be removed and properly disposed.

Rock Sock	
Functions	
Erosion Control	No
Sediment Control	Yes
Site/Material Management	No



ROCK SOCK SECTION

ROCK SOCK PLAN



ROCK SOCK JOINTING

ANY GAP AT JOINT SHALL BE FILLED WITH AN ADEQUATE AMOUNT OF 1½" (MINUS) CRUSHED ROCK AND WRAPPED WITH ADDITIONAL WIRE MESH SECURED TO ENDS OF ROCK REINFORCED SOCK. AS AN ALTERNATIVE TO FILLING JOINTS BETWEEN ADJOINING ROCK SOCKS WITH CRUSHED ROCK AND ADDITIONAL WIRE WRAPPING, ROCK SOCKS CAN BE OVERLAPPED (TYPICALLY 12–INCH OVERLAP) TO AVOID GAPS.

GRADATION TABLE	
SIEVE SIZE	MASS PERCENT PASSING SQUARE MESH SIEVES
	NO. 4
2"	100
1½"	90 – 100
1"	20 – 55
¾"	0 – 15
⅜"	0 – 5
MATCHES SPECIFICATIONS FOR NO. 4 COARSE AGGREGATE FOR CONCRETE PER AASHTO M43. ALL ROCK SHALL BE FRACTURED FACE, ALL SIDES.	

ROCK SOCK INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   –LOCATION(S) OF ROCK SOCKS.

2. CRUSHED ROCK SHALL BE 1½" (MINUS) IN SIZE WITH A FRACTURED FACE (ALL SIDES) AND SHALL COMPLY WITH GRADATION SHOWN ON THIS SHEET (1½" MINUS).

3. WIRE MESH SHALL BE FABRICATED OF 10 GAGE POULTRY MESH, OR EQUIVALENT, WITH A MAXIMUM OPENING OF ½", RECOMMENDED MINIMUM ROLL WIDTH OF 48"

4. 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.

5. SOME MUNICIPALITIES MAY ALLOW THE USE OF FILTER FABRIC AS AN ALTERNATIVE TO WIRE MESH FOR THE ROCK ENCLOSURE.

RS–1. ROCK SOCK PERIMETER CONTROL

ROCK SOCK MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. ROCK SOCKS SHALL BE REPLACED IF THEY BECOME HEAVILY SOILED, OR DAMAGED BEYOND REPAIR.

5. SEDIMENT ACCUMULATED UPSTREAM OF ROCK SOCKS SHALL BE REMOVED AS NEEDED TO MAINTAIN FUNCTIONALITY OF THE BMP, TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY ½ OF THE HEIGHT OF THE ROCK SOCK.

6. ROCK SOCKS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION.

7. WHEN ROCK SOCKS ARE REMOVED, ALL DISTURBED AREAS SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION.

(DETAIL ADAPTED FROM TOWN OF PARKER, COLORADO AND CITY OF AURORA, COLORADO, NOT AVAILABLE IN AUTOCAD)

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

NOTE: THE DETAILS INCLUDED WITH THIS FACT SHEET SHOW COMMONLY USED, CONVENTIONAL METHODS OF ROCK SOCK INSTALLATION IN THE DENVER METROPOLITAN AREA. THERE ARE MANY OTHER SIMILAR PROPRIETARY PRODUCTS ON THE MARKET. UDFCD NEITHER NDORSES NOR DISCOURAGES USE OF PROPRIETARY PROTECTION PRODUCTS; HOWEVER, IN THE EVENT PROPRIETARY METHODS ARE USED, THE APPROPRIATE DETAIL FROM THE MANUFACTURER MUST BE INCLUDED IN THE SWMP AND THE BMP MUST BE INSTALLED AND MAINTAINED AS SHOWN IN THE MANUFACTURER'S DETAILS.

Inlet Protection (IP) SC-6

Description

Inlet protection consists of permeable barriers installed around an inlet to filter runoff and remove sediment prior to entering a storm drain inlet. Inlet protection can be constructed from rock socks, sediment control logs, silt fence, block and rock socks, or other materials approved by the local jurisdiction. Area inlets can also be protected by over-excavating around the inlet to form a sediment trap.



Photograph IP-1. Inlet protection for a curb opening inlet.

Appropriate Uses

Install protection at storm sewer inlets that are operable during construction. Consider the potential for tracked-out sediment or temporary stockpile areas to contribute sediment to inlets when determining which inlets must be protected. This may include inlets in the general proximity of the construction area, not limited to downgradient inlets. Inlet protection is not a stand-alone BMP and should be used in conjunction with other upgradient BMPs.

Design and Installation

To function effectively, inlet protection measures must be installed to ensure that flows do not bypass the inlet protection and enter the storm drain without treatment. However, designs must also enable the inlet to function without completely blocking flows into the inlet in a manner that causes localized flooding. When selecting the type of inlet protection, consider factors such as type of inlet (e.g., curb or area, sump or on-grade conditions), traffic, anticipated flows, ability to secure the BMP properly, safety and other site-specific conditions. For example, block and rock socks will be better suited to a curb and gutter along a roadway, as opposed to silt fence or sediment control logs, which cannot be properly secured in a curb and gutter setting, but are effective area inlet protection measures.

Several inlet protection designs are provided in the Design Details. Additionally, a variety of proprietary products are available for inlet protection that may be approved for use by local governments. If proprietary products are used, design details and installation procedures from the manufacturer must be followed. Regardless of the type of inlet protection selected, inlet protection is most effective when combined with other BMPs such as curb socks and check dams. Inlet protection is often the last barrier before runoff enters the storm sewer or receiving water.

Design details with notes are provided for these forms of inlet protection:

IP-1. Block and Rock Sock Inlet Protection for Sump or On-grade Inlets

IP-2. Curb (Rock) Socks Upstream of Inlet Protection, On-grade Inlets

Inlet Protection (various forms)	
Functions	
Erosion Control	No
Sediment Control	Yes
Site/Material Management	No

IP-3. Rock Sock Inlet Protection for Sump/Area Inlet

IP-4. Silt Fence Inlet Protection for Sump/Area Inlet

IP-5. Over-excavation Inlet Protection

IP-6. Straw Bale Inlet Protection for Sump/Area Inlet

CIP-1. Culvert Inlet Protection

Propriety inlet protection devices should be installed in accordance with manufacturer specifications.

More information is provided below on selecting inlet protection for sump and on-grade locations.

Inlets Located in a Sump

When applying inlet protection in sump conditions, it is important that the inlet continue to function during larger runoff events. For curb inlets, the maximum height of the protective barrier should be lower than the top of the curb opening to allow overflow into the inlet during larger storms without excessive localized flooding. If the inlet protection height is greater than the curb elevation, particularly if the filter becomes clogged with sediment, runoff will not enter the inlet and may bypass it, possibly causing localized flooding, public safety issues, and downstream erosion and damage from bypassed flows.

Area inlets located in a sump setting can be protected through the use of silt fence, concrete block and rock socks (on paved surfaces), sediment control logs/straw wattles embedded in the adjacent soil and stacked around the area inlet (on pervious surfaces), over-excavation around the inlet, and proprietary products providing equivalent functions.

Inlets Located on a Slope

For curb and gutter inlets on paved sloping streets, block and rock sock inlet protection is recommended in conjunction with curb socks in the gutter leading to the inlet. For inlets located along unpaved roads, also see the Check Dam Fact Sheet.

Maintenance and Removal

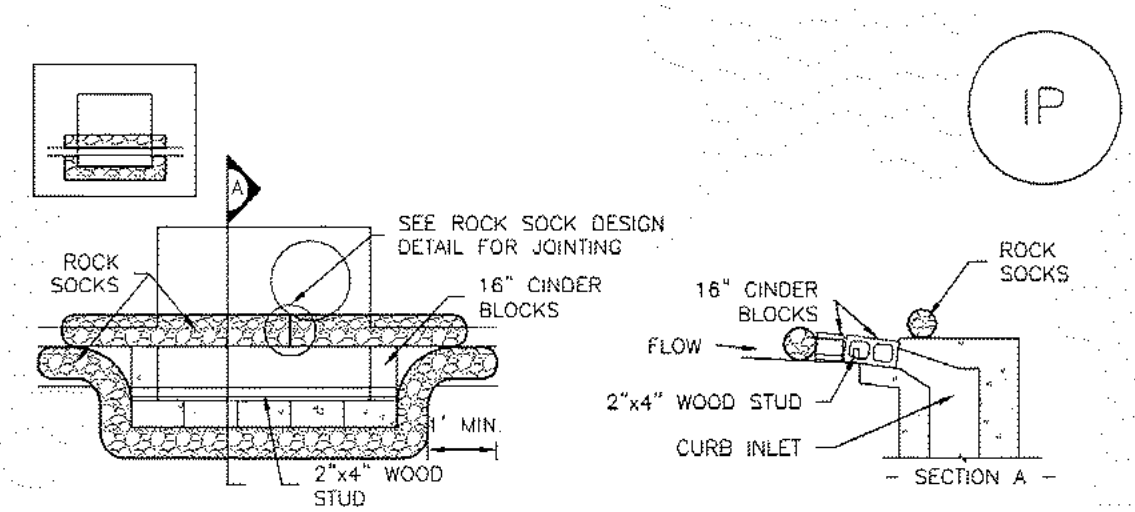
Inspect inlet protection frequently. Inspection and maintenance guidance includes:

- Inspect for tears that can result in sediment directly entering the inlet, as well as result in the contents of the BMP (e.g., gravel) washing into the inlet.
- Check for improper installation resulting in untreated flows bypassing the BMP and directly entering the inlet or bypassing to an unprotected downstream inlet. For example, silt fence that has not been properly trenched around the inlet can result in flows under the silt fence and directly into the inlet.
- Look for displaced BMPs that are no longer protecting the inlet. Displacement may occur following larger storm events that wash away or reposition the inlet protection. Traffic or equipment may also crush or displace the BMP.
- Monitor sediment accumulation upgradient of the inlet protection.

- Remove sediment accumulation from the area upstream of the inlet protection, as needed to maintain BMP effectiveness, typically when it reaches no more than half the storage capacity of the inlet protection. For silt fence, remove sediment when it accumulates to a depth of no more than 6 inches. Remove sediment accumulation from the area upstream of the inlet protection as needed to maintain the functionality of the BMP.

- Propriety inlet protection devices should be inspected and maintained in accordance with manufacturer specifications. If proprietary inlet insert devices are used, sediment should be removed in a timely manner to prevent devices from breaking and spilling sediment into the storm drain.

Inlet protection must be removed and properly disposed of when the drainage area for the inlet has reached final stabilization.



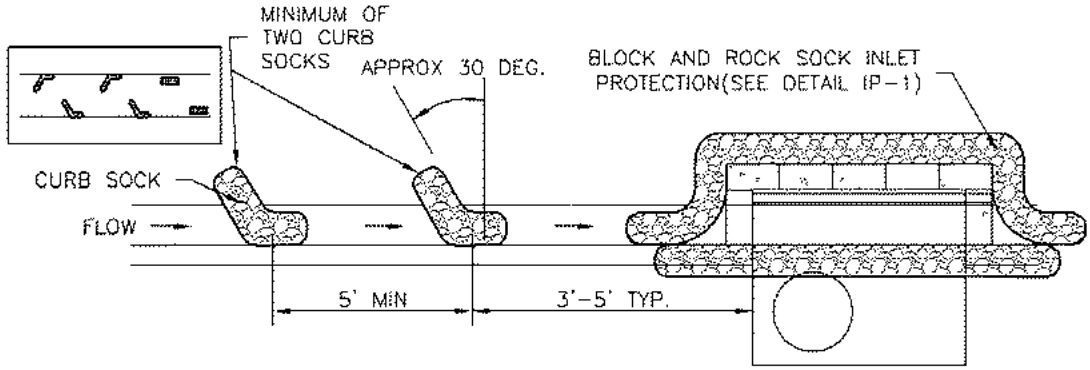
IP–1. BLOCK AND ROCK SOCK SUMP OR ON GRADE INLET PROTECTION

BLOCK AND CURB SOCK INLET PROTECTION INSTALLATION NOTES

1. SEE ROCK SOCK DESIGN DETAIL FOR INSTALLATION REQUIREMENTS.

2. CONCRETE "CINDER" BLOCKS SHALL BE LAID ON THEIR SIDES AROUND THE INLET IN A SINGLE ROW, ABUTTING ONE ANOTHER WITH THE OPEN END FACING AWAY FROM THE CURB.

3. GRAVEL BAGS SHALL BE PLACED AROUND CONCRETE BLOCKS, CLOSELY ABUTTING ONE ANOTHER AND JOINTED TOGETHER IN ACCORDANCE WITH ROCK SOCK DESIGN DETAIL.



IP–2. CURB ROCK SOCKS UPSTREAM OF INLET PROTECTION

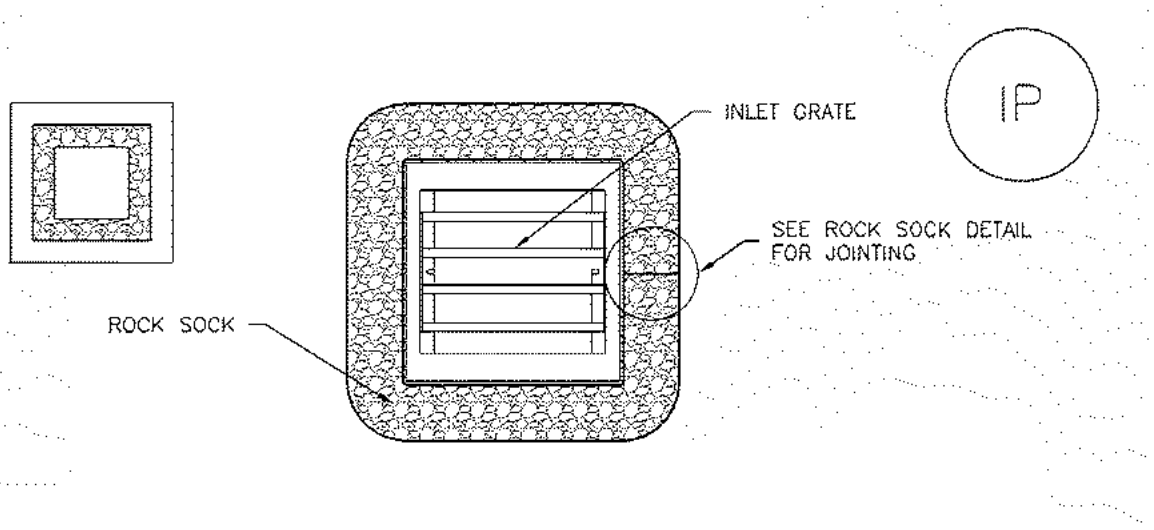
CURB ROCK SOCK INLET PROTECTION INSTALLATION NOTES

1. SEE ROCK SOCK DESIGN DETAIL INSTALLATION REQUIREMENTS.

2. PLACEMENT OF THE SOCK SHALL BE APPROXIMATELY 30 DEGREES FROM PERPENDICULAR IN THE OPPOSITE DIRECTION OF FLOW.

3. SOCKS ARE TO BE FLUSH WITH THE CURB AND SPACED A MINIMUM OF 5 FEET APART.

4. AT LEAST TWO CURB SOCKS IN SERIES ARE REQUIRED UPSTREAM OF ON–GRADE INLETS.

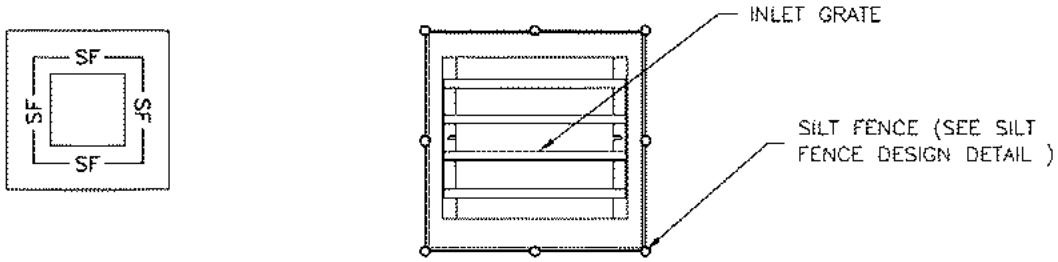


IP–3. ROCK SOCK SUMP/AREA INLET PROTECTION

ROCK SOCK SUMP/AREA INLET PROTECTION INSTALLATION NOTES

1. SEE ROCK SOCK DESIGN DETAIL FOR INSTALLATION REQUIREMENTS.

2. STRAW WATTLES/SEDIMENT CONTROL LOGS MAY BE USED IN PLACE OF ROCK SOCKS FOR INLETS IN PERVIOUS AREAS. INSTALL PER SEDIMENT CONTROL LOG DETAIL.



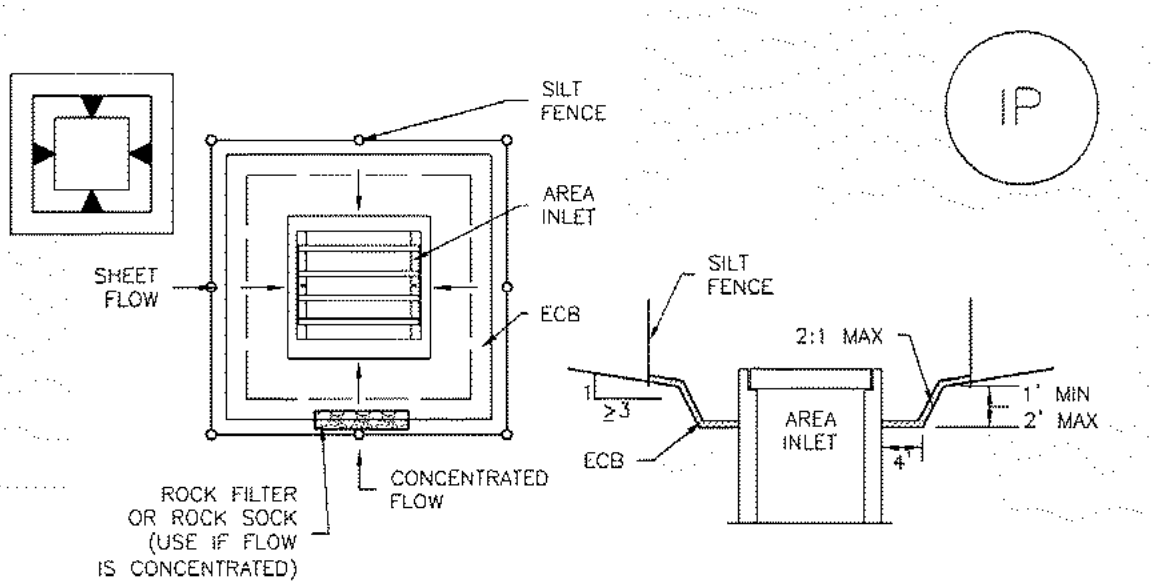
IP–4. SILT FENCE FOR SUMP INLET PROTECTION

SILT FENCE INLET PROTECTION INSTALLATION NOTES

1. SEE SILT FENCE DESIGN DETAIL FOR INSTALLATION REQUIREMENTS.

2. POSTS SHALL BE PLACED AT EACH CORNER OF THE INLET AND AROUND THE EDGES AT A MAXIMUM SPACING OF 3 FEET.

3. STRAW WATTLES/SEDIMENT CONTROL LOGS MAY BE USED IN PLACE OF SILT FENCE FOR INLETS IN PERVIOUS AREAS. INSTALL PER SEDIMENT CONTROL LOG DETAIL.



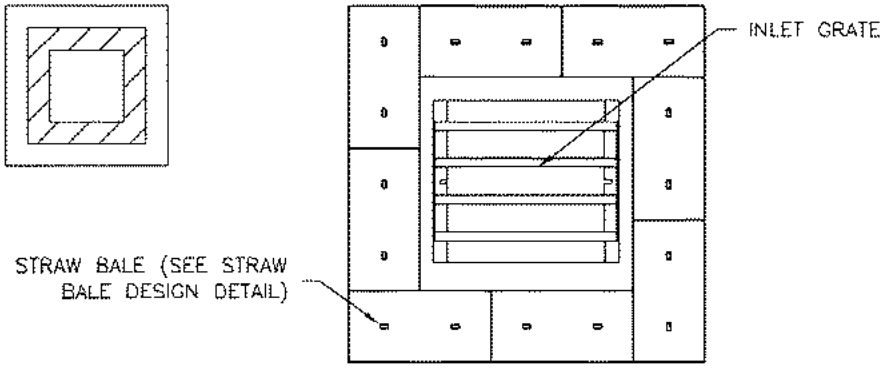
IP–5. OVEREXCAVATION INLET PROTECTION

OVEREXCAVATION INLET PROTECTION INSTALLATION NOTES

1. THIS FORM OF INLET PROTECTION IS PRIMARILY APPLICABLE FOR SITES THAT HAVE NOT YET REACHED FINAL GRADE AND SHOULD BE USED ONLY FOR INLETS WITH A RELATIVELY SMALL CONTRIBUTING DRAINAGE AREA.

2. WHEN USING FOR CONCENTRATED FLOWS, SHAPE BASIN IN 2:1 RATIO WITH LENGTH ORIENTED TOWARDS DIRECTION OF FLOW.

3. SEDIMENT MUST BE PERIODICALLY REMOVED FROM THE OVEREXCAVATED AREA.

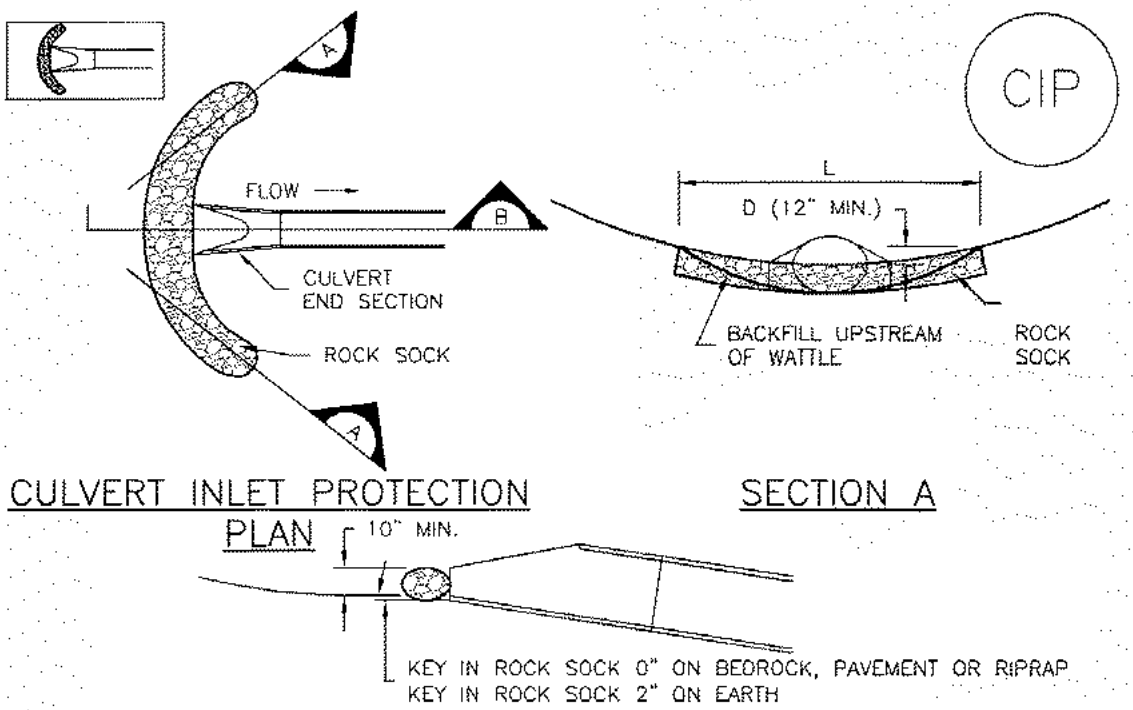


IP–6. STRAW BALE FOR SUMP INLET PROTECTION

STRAW BALE BARRIER INLET PROTECTION INSTALLATION NOTES

1. SEE STRAW BALE DESIGN DETAIL FOR INSTALLATION REQUIREMENTS.

2. BALES SHALL BE PLACED IN A SINGLE ROW AROUND THE INLET WITH ENDS OF BALES TIGHTLY ABUTTING ONE ANOTHER.



CIP–1. CULVERT INLET PROTECTION

CULVERT INLET PROTECTION INSTALLATION NOTES

1. SEE PLAN VIEW FOR
   –LOCATION OF CULVERT INLET PROTECTION.

2. SEE ROCK SOCK DESIGN DETAIL FOR ROCK GRADATION REQUIREMENTS AND JOINTING DETAIL.

CULVERT INLET PROTECTION MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. SEDIMENT ACCUMULATED UPSTREAM OF THE CULVERT SHALL BE REMOVED WHEN THE SEDIMENT DEPTH IS ½ THE HEIGHT OF THE ROCK SOCK.

5. CULVERT INLET PROTECTION SHALL REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS PERMANENTLY STABILIZED AND APPROVED BY THE LOCAL JURISDICTION.

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

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

GENERAL INLET PROTECTION INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   -LOCATION OF INLET PROTECTION.
   -TYPE OF INLET PROTECTION (IP.1, IP.2, IP.3, IP.4, IP.5, IP.6)

2. INLET PROTECTION SHALL BE INSTALLED PROMPTLY AFTER INLET CONSTRUCTION OR PAVING IS COMPLETE (TYPICALLY WITHIN 48 HOURS). IF A RAINFALL/RUNOFF EVENT IS FORECAST, INSTALL INLET PROTECTION PRIOR TO ONSET OF EVENT.

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

INLET PROTECTION MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. SEDIMENT ACCUMULATED UPSTREAM OF INLET PROTECTION SHALL BE REMOVED AS NECESSARY TO MAINTAIN BMP EFFECTIVENESS, TYPICALLY WHEN STORAGE VOLUME REACHES 50% OF CAPACITY, A DEPTH OF 6" WHEN SILT FENCE IS USED, OR ¼ OF THE HEIGHT FOR STRAW BALES.

5. INLET PROTECTION IS TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS PERMANENTLY STABILIZED, UNLESS THE LOCAL JURISDICTION APPROVES EARLIER REMOVAL OF INLET PROTECTION IN STREETS.

6. WHEN INLET PROTECTION AT AREA INLETS IS REMOVED, THE DISTURBED AREA SHALL BE COVERED WITH TOP SOIL, SEEDED AND MULCHED, OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

(DETAIL ADAPTED FROM TOWN OF PARKER, COLORADO AND CITY OF AURORA, COLORADO, NOT AVAILABLE IN AUTOCAD)

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

NOTE: THE DETAILS INCLUDED WITH THIS FACT SHEET SHOW COMMONLY USED, CONVENTIONAL METHODS OF INLET PROTECTION IN THE DENVER METROPOLITAN AREA. THERE ARE MANY PROPRIETARY INLET PROTECTION METHODS ON THE MARKET. UDFCD NEITHER ENDORSES NOR DISCOURAGES USE OF PROPRIETARY INLET PROTECTION; HOWEVER, IN THE EVENT PROPRIETARY METHODS ARE USED, THE APPROPRIATE DETAIL FROM THE MANUFACTURER MUST BE INCLUDED IN THE SWMP AND THE BMP MUST BE INSTALLED AND MAINTAINED AS SHOWN IN THE MANUFACTURER'S DETAILS.

NOTE: SOME MUNICIPALITIES DISCOURAGE OR PROHIBIT THE USE OF STRAW BALES FOR INLET PROTECTION. CHECK WITH LOCAL JURISDICTION TO DETERMINE IF STRAW BALE INLET PROTECTION IS ACCEPTABLE.

Sediment Basin (SB) SC-7

Description

A sediment basin is a temporary pond built on a construction site to capture eroded or disturbed soil transported in storm runoff prior to discharge from the site. Sediment basins are designed to capture site runoff and slowly release it to allow time for settling of sediment prior to discharge. Sediment basins are often constructed in locations that will later be modified to serve as post-construction stormwater basins.



Photograph SB-1. Sediment basin at the toe of a slope. Photo courtesy of WWE.

Appropriate Uses

Most large construction sites (typically greater than 2 acres) will require one or more sediment basins for effective management of construction site runoff. On linear construction projects, sediment basins may be impractical; instead, sediment traps or other combinations of BMPs may be more appropriate.

Sediment basins should not be used as stand-alone sediment controls. Erosion and other sediment controls should also be implemented upstream.

When feasible, the sediment basin should be installed in the same location where a permanent post-construction detention pond will be located.

Design and Installation

The design procedure for a sediment basin includes these steps:

- **Basin Storage Volume**: Provide a storage volume of at least 3,600 cubic feet per acre of drainage area. To the extent practical, undisturbed and/or off-site areas should be diverted around sediment basins to prevent "clean" runoff from mixing with runoff from disturbed areas. For undisturbed areas (both on-site and off-site) that cannot be diverted around the sediment basin, provide a minimum of 500 ft^3/acre of storage for undeveloped (but stable) off-site areas in addition to the 3,600 ft^3/acre for disturbed areas. For stable, developed areas that cannot be diverted around the sediment basin, storage volume requirements are summarized in Table SB-1.

- **Basin Geometry:** Design basin with a minimum length-to-width ratio of 2:1 (L:W). If this cannot be achieved because of site space constraints, baffling may be required to extend the effective distance between the inflow point(s) and the outlet to minimize short-circuiting.

- **Dam Embankment**: It is recommended that embankment slopes be 4:1 (H:V) or flatter and no steeper than 3:1 (H:V) in any location.

Sediment Basins	
Functions	
Erosion Control	No
Sediment Control	Yes
Site/Material Management	No

- **Inflow Structure**: For concentrated flow entering the basin, provide energy dissipation at the point of inflow.

Table SB-1. Additional Volume Requirements for Undisturbed and Developed Tributary Areas Draining through Sediment Basins

Imperviousness (%)	Additional Storage Volume (ft^3) Per Acre of Tributary Area
Undeveloped	500
10	800
20	1230
30	1600
40	2030
50	2470
60	2980
70	3560
80	4360
90	5300
100	6460

- **Outlet Works**: The outlet pipe shall extend through the embankment at a minimum slope of 0.5 percent. Outlet works can be designed using one of the following approaches:

  - **Riser Pipe (Simplified Detail):** Detail SB-1 provides a simplified design for basins treating no more than 15 acres.

  - **Orifice Plate or Riser Pipe**: Follow the design criteria for Full Spectrum Detention outlets in the EDB Fact Sheet provided in Chapter 4 of this manual for sizing of outlet perforations with an emptying time of approximately 72 hours. In lieu of the trash rack, pack uniformly sized 1½ - to 2-inch gravel in front of the plate or surrounding the riser pipe. This gravel will need to be cleaned out frequently during the construction period as sediment accumulates within it. The gravel pack will need to be removed and disposed of following construction to reclaim the basin for use as a permanent detention facility. If the basin will be used as a permanent extended detention basin for the site, a trash rack will need to be installed once contributing drainage areas have been stabilized and the gravel pack and accumulated sediment have been removed.

  - **Floating Skimmer**: If a floating skimmer is used, install it using manufacturer's recommendations. Illustration SB-1 provides an illustration of a Faircloth Skimmer Floating Outlet™, one of the more commonly used floating skimmer outlets. A skimmer should be designed to release the design volume in no less than 48 hours. The use of a floating skimmer outlet can increase the sediment capture efficiency of a basin significantly. A floating outlet continually decants cleanest water off the surface of the pond and releases cleaner water than would discharge from a perforated riser pipe or plate.

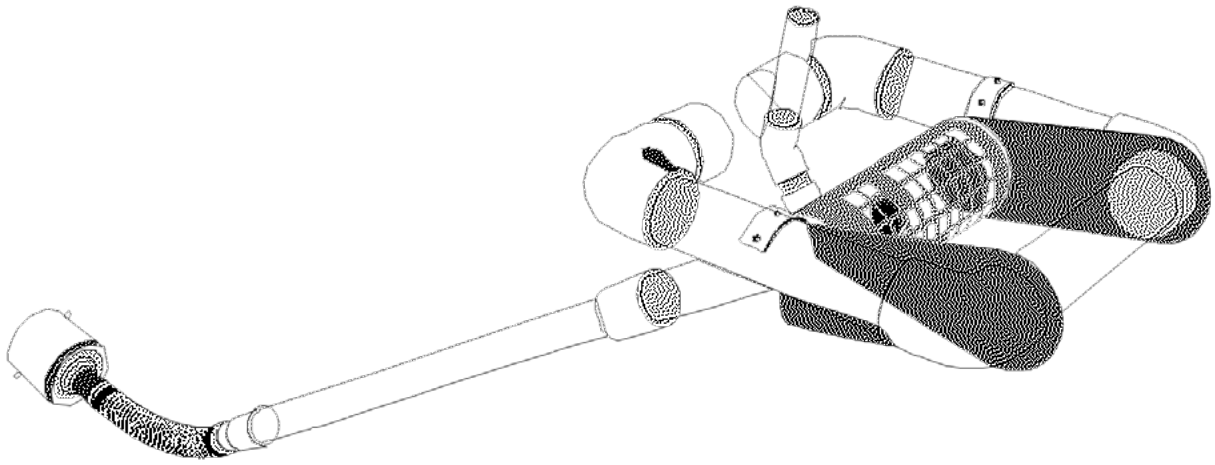


Illustration SB-1. Outlet structure for a temporary sediment basin - Faircloth Skimmer Floating Outlet. Illustration courtesy of J. W. Faircloth & Sons, Inc., FairclothSkimmer.com.

- **Outlet Protection and Spillway:** Consider all flow paths for runoff leaving the basin, including protection at the typical point of discharge as well as overtopping.
  - **Outlet Protection:** Outlet protection should be provided where the velocity of flow will exceed the maximum permissible velocity of the material of the waterway into which discharge occurs. This may require the use of a riprap apron at the outlet location and/or other measures to keep the waterway from eroding.
  - **Emergency Spillway:** Provide a stabilized emergency overflow spillway for rainstorms that exceed the capacity of the sediment basin volume and its outlet. Protect basin embankments from erosion and overtopping. If the sediment basin will be converted to a permanent detention basin, design and construct the emergency spillway(s) as required for the permanent facility. If the sediment basin will not become a permanent detention basin, it may be possible to substitute a heavy polyvinyl membrane or properly bedded rock cover to line the spillway and downstream embankment, depending on the height, slope, and width of the embankments.

Maintenance and Removal

Maintenance activities include the following:

- Dredge sediment from the basin, as needed to maintain BMP effectiveness, typically when the design storage volume is no more than one-third filled with sediment.
- Inspect the sediment basin embankments for stability and seepage.
- Inspect the inlet and outlet of the basin, repair damage, and remove debris. Remove, clean and replace the gravel around the outlet on a regular basis to remove the accumulated sediment within it and keep the outlet functioning.
- Be aware that removal of a sediment basin may require dewatering and associated permit requirements.
- Do not remove a sediment basin until the upstream area has been stabilized with vegetation.

Final disposition of the sediment basin depends on whether the basin will be converted to a permanent post-construction stormwater basin or whether the basin area will be returned to grade. For basins being converted to permanent detention basins, remove accumulated sediment and reconfigure the basin and outlet to meet the requirements of the final design for the detention facility. If the sediment basin is not to be used as a permanent detention facility, fill the excavated area with soil and stabilize with vegetation.

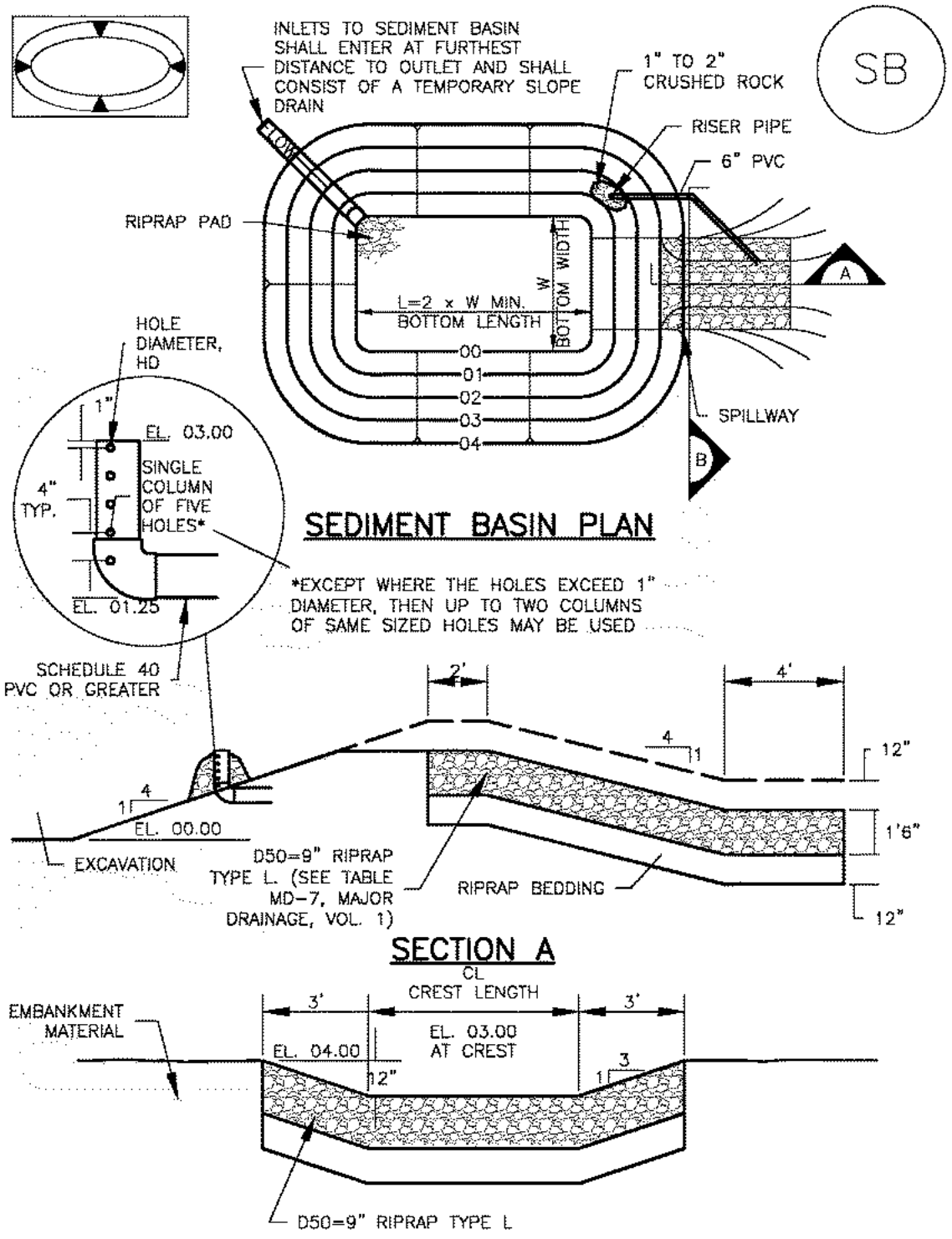

SB
INLETS TO SEDIMENT BASIN SHALL ENTER AT FURTHEST DISTANCE TO OUTLET AND SHALL CONSIST OF A TEMPORARY SLOPE DRAIN
FLOW
1" TO 2" CRUSHED ROCK
RISER PIPE
6" PVC
RIPRAP PAD
W
BOTTOM WIDTH
L=2 x W MIN.
BOTTOM LENGTH
00
01
02
03
04
A
B
SPILLWAY
HOLE DIAMETER, HD
1"
EL. 03.00
4" TYP.
SINGLE COLUMN OF FIVE HOLES*
EL. 01.25
SEDIMENT BASIN PLAN
*EXCEPT WHERE THE HOLES EXCEED 1" DIAMETER, THEN UP TO TWO COLUMNS OF SAME SIZED HOLES MAY BE USED
SCHEDULE 40 PVC OR GREATER
2'
4'
4
1
12"
4
1
EL. 00.00
1'6"
EXCAVATION
D50=9" RIPRAP TYPE L. (SEE TABLE MD-7, MAJOR DRAINAGE, VOL. 1)
RIPRAP BEDDING
12"
SECTION A
CL
CREST LENGTH
3'
3'
EMBANKMENT MATERIAL
EL. 04.00
EL. 03.00 AT CREST
12"
3
1
D50=9" RIPRAP TYPE L

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	12 ½	2	9/32
2	21	3	13/16
3	28	5	½
4	33 ½	6	9/16
5	38 ½	8	21/32
6	43	9	21/32
7	47 ¼	11	25/32
8	51	12	27/32
9	55	13	⅞
10	58 ¼	15	15/16
11	61	16	31/32
12	64	18	1
13	67 ½	19	1 1/16
14	70 ½	21	1 ⅛
15	73 ¼	22	1 3/16

SEDIMENT BASIN INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   - -LOCATION OF SEDIMENT BASIN.
   - -TYPE OF BASIN (STANDARD BASIN OR NONSTANDARD BASIN).
   - -FOR STANDARD BASIN, BOTTOM WIDTH W, CREST LENGTH CL, AND HOLE DIAMETER, HD.
   - -FOR NONSTANDARD BASIN, SEE CONSTRUCTION DRAWINGS FOR DESIGN OF BASIN INCLUDING RISER HEIGHT H, NUMBER OF COLUMNS N, HOLE DIAMETER HD AND PIPE DIAMETER D.

2. FOR STANDARD BASIN, BOTTOM DIMENSION MAY BE MODIFIED AS LONG AS BOTTOM AREA IS NOT REDUCED.

3. SEDIMENT BASINS SHALL BE INSTALLED PRIOR TO ANY OTHER LAND-DISTURBING ACTIVITY THAT RELIES ON ON BASINS AS AS A STORMWATER CONTROL.

4. 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.

5. EMBANKMENT MATERIAL SHALL BE COMPACTED TO AT LEAST 95 PERCENT OF MAXIMUM DENSITY IN ACCORDANCE WITH ASTM D698.

6. PIPE SCH 40 OR GREATER SHALL BE USED.

7. 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.

SEDIMENT BASIN MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

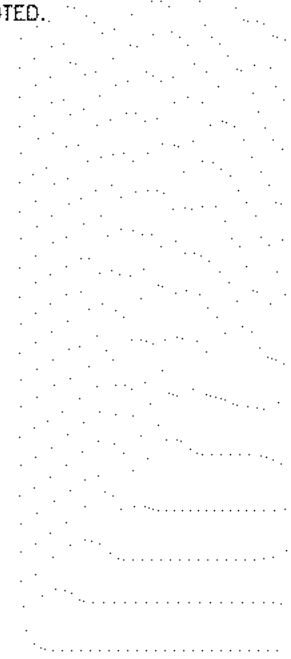
4. SEDIMENT ACCUMULATED IN BASIN SHALL BE REMOVED AS NEEDED TO MAINTAIN BMP EFFECTIVENESS, TYPICALLY WHEN SEDIMENT DEPTH REACHES ONE FOOT (I.E., TWO FEET BELOW THE SPILLWAY CREST).

5. SEDIMENT BASINS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVER IS ACCEPTED BY THE LOCAL JURISDICTION.

6. WHEN SEDIMENT BASINS ARE REMOVED, ALL DISTURBED AREAS SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION.

(DETAILS ADAPTED FROM DOUGLAS COUNTY, COLORADO)

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



Construction Fence (CF) SM-3

Description

A construction fence restricts site access to designated entrances and exits, delineates construction site boundaries, and keeps construction out of sensitive areas such as natural areas to be preserved as open space, wetlands and riparian areas.



Photograph CF-1. A construction fence helps delineate areas where existing vegetation is being protected. Photo courtesy of Douglas County.

Appropriate Uses

A construction fence can be used to delineate the site perimeter and locations within the site where access is restricted to protect natural resources such as wetlands, waterbodies, trees, and other natural areas of the site that should not be disturbed.

If natural resource protection is an objective, then the construction fencing should be used in combination with other perimeter control BMPs such as silt fence, sediment control logs or similar measures.

Design and Installation

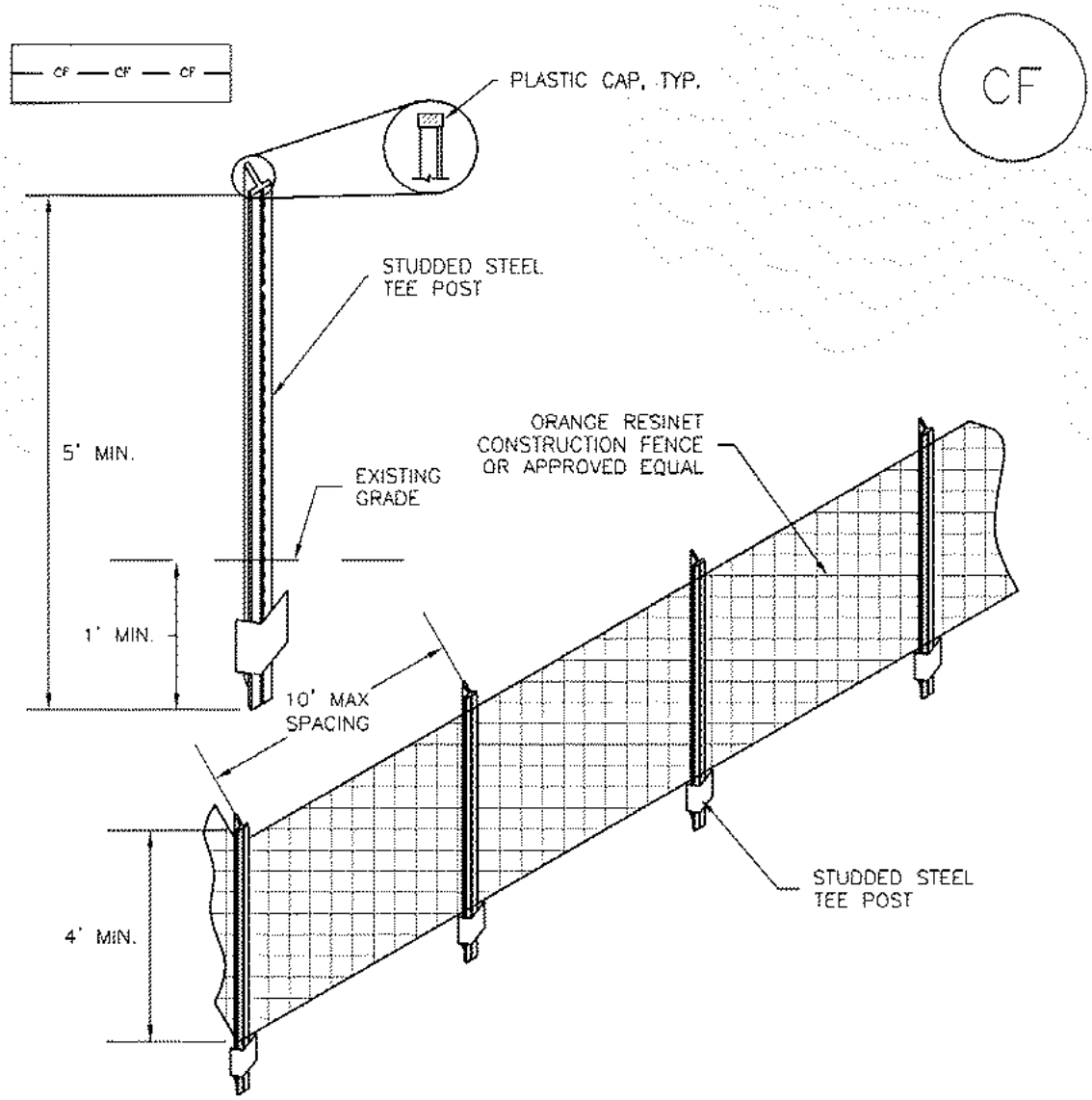
Construction fencing may be chain link or plastic mesh and should be installed following manufacturer's recommendations. See Detail CF-1 for typical installations.

Do not place construction fencing in areas within work limits of machinery.

Maintenance and Removal

- Inspect fences for damage; repair or replace as necessary.
- Fencing should be tight and any areas with slumping or fallen posts should be reinstalled.
- Fencing should be removed once construction is complete.

Construction Fence	
Functions	
Erosion Control	No
Sediment Control	No
Site/Material Management	Yes



CF–1. PLASTIC MESH CONSTRUCTION FENCE

CONSTRUCTION FENCE INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   –LOCATION OF CONSTRUCTION FENCE.

2. CONSTRUCTION FENCE SHOWN SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.

3. CONSTRUCTION FENCE SHALL BE COMPOSED OF ORANGE, CONTRACTOR–GRADE MATERIAL THAT IS AT LEAST 4' HIGH. METAL POSTS SHOULD HAVE A PLASTIC CAP FOR SAFETY.

4. STUDDED STEEL TEE POSTS SHALL BE UTILIZED TO SUPPORT THE CONSTRUCTION FENCE. MAXIMUM SPACING FOR STEEL TEE POSTS SHALL BE 10'.

5. CONSTRUCTION FENCE SHALL BE SECURELY FASTENED TO THE TOP, MIDDLE, AND BOTTOM OF EACH POST.

CONSTRUCTION FENCE MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. CONSTRUCTION FENCE SHALL BE REPAIRED OR REPLACED WHEN THERE ARE SIGNS OF DAMAGE SUCH AS RIPS OR SAGS. CONSTRUCTION FENCE IS TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION.

5. WHEN CONSTRUCTION FENCES ARE REMOVED, ALL DISTURBED AREAS ASSOCIATED WITH THE INSTALLATION, MAINTENANCE, AND/OR REMOVAL OF THE FENCE SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED, OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION.

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

(DETAIL ADAPTED FROM TOWN OF PARKER, COLORADO, NOT AVAILABLE IN AUTOCAD)

Vehicle Tracking Control (VTC) SM-4

Description

Vehicle tracking controls provide stabilized construction site access where vehicles exit the site onto paved public roads. An effective vehicle tracking control helps remove sediment (mud or dirt) from vehicles, reducing tracking onto the paved surface.



Photograph VTC-1. A vehicle tracking control pad constructed with properly sized rock reduces off-site sediment tracking.

Appropriate Uses

Implement a stabilized construction entrance or vehicle tracking control where frequent heavy vehicle traffic exits the construction site onto a paved roadway. An effective vehicle tracking control is particularly important during the following conditions:

- Wet weather periods when mud is easily tracked off site.
- During dry weather periods where dust is a concern.
- When poorly drained, clayey soils are present on site.

Although wheel washes are not required in designs of vehicle tracking controls, they may be needed at particularly muddy sites.

Design and Installation

Construct the vehicle tracking control on a level surface. Where feasible, grade the tracking control towards the construction site to reduce off-site runoff. Place signage, as needed, to direct construction vehicles to the designated exit through the vehicle tracking control. There are several different types of stabilized construction entrances including:

VTC-1. Aggregate Vehicle Tracking Control. This is a coarse-aggregate surfaced pad underlain by a geotextile. This is the most common vehicle tracking control, and when properly maintained can be effective at removing sediment from vehicle tires.

VTC-2. Vehicle Tracking Control with Construction Mat or Turf Reinforcement Mat. This type of control may be appropriate for site access at very small construction sites with low traffic volume over vegetated areas. Although this application does not typically remove sediment from vehicles, it helps protect existing vegetation and provides a stabilized entrance.

Vehicle Tracking Control	
Functions	
Erosion Control	Moderate
Sediment Control	Yes
Site/Material Management	Yes

VTC-3. Stabilized Construction Entrance/Exit with Wheel Wash. This is an aggregate pad, similar to VTC-1, but includes equipment for tire washing. The wheel wash equipment may be as simple as hand-held power washing equipment to more advance proprietary systems. When a wheel wash is provided, it is important to direct wash water to a sediment trap prior to discharge from the site.

Vehicle tracking controls are sometimes installed in combination with a sediment trap to treat runoff.

Maintenance and Removal

Inspect the area for degradation and replace aggregate or material used for a stabilized entrance/exit as needed. If the area becomes clogged and ponds water, remove and dispose of excess sediment or replace material with a fresh layer of aggregate as necessary.

With aggregate vehicle tracking controls, ensure rock and debris from this area do not enter the public right-of-way.

Remove sediment that is tracked onto the public right of way daily or more frequently as needed. Excess sediment in the roadway indicates that the stabilized construction entrance needs maintenance.

Ensure that drainage ditches at the entrance/exit area remain clear.

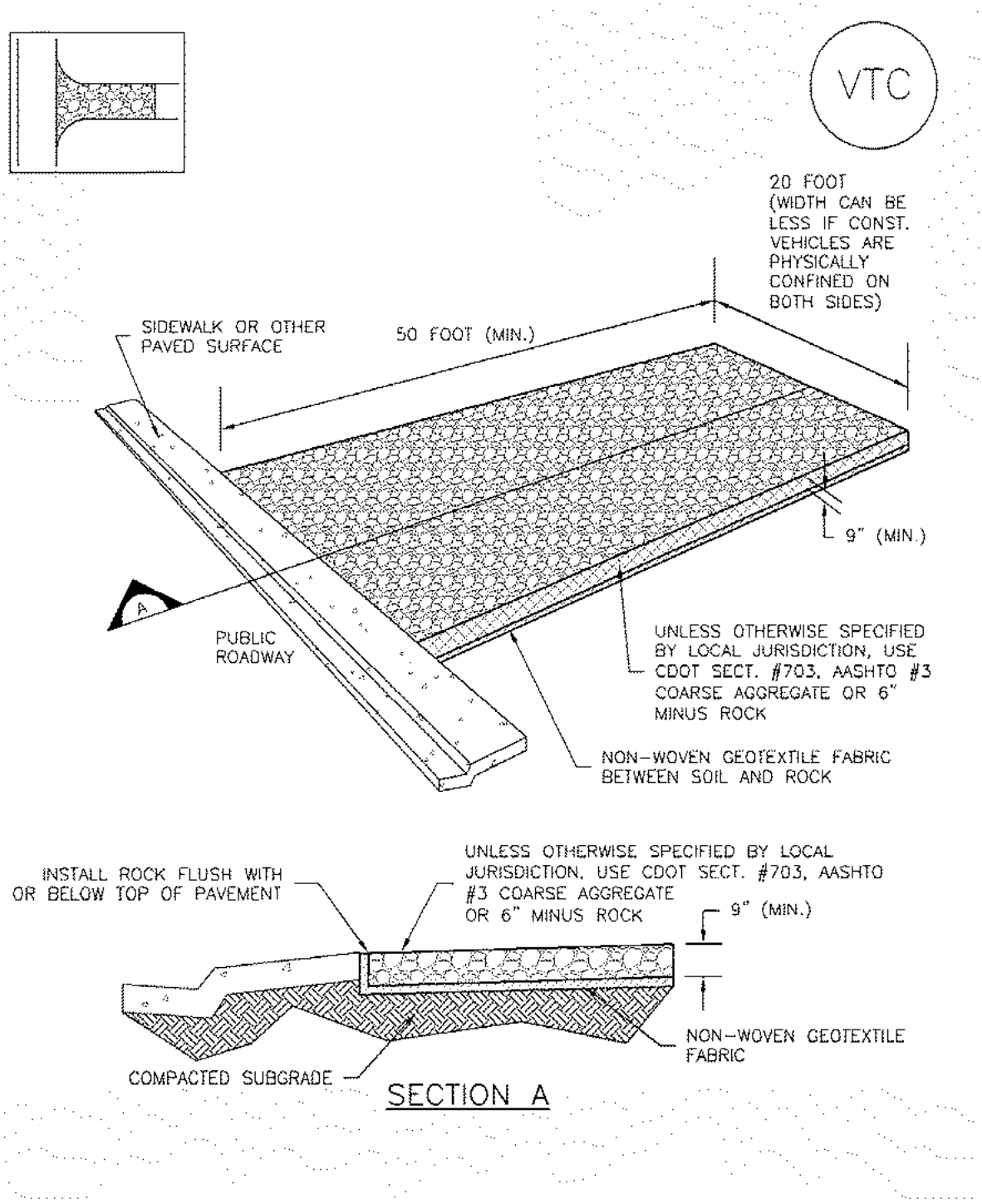


Photograph VTC-2. A vehicle tracking control pad with wheel wash facility. Photo courtesy of Tom Gore.

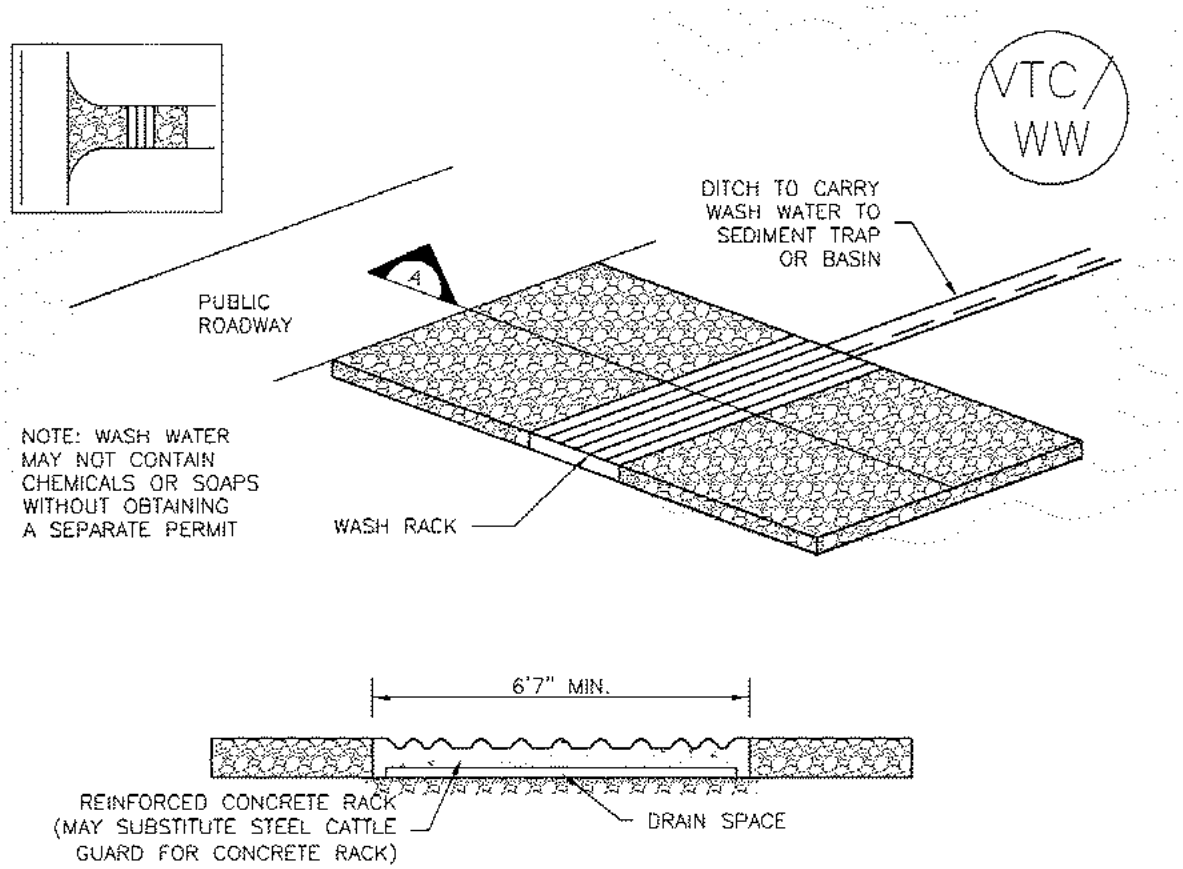
A stabilized entrance should be removed only when there is no longer the potential for vehicle tracking to occur. This is typically after the site has been stabilized.

When wheel wash equipment is used, be sure that the wash water is discharged to a sediment trap prior to discharge. Also inspect channels conveying the water from the wash area to the sediment trap and stabilize areas that may be eroding.

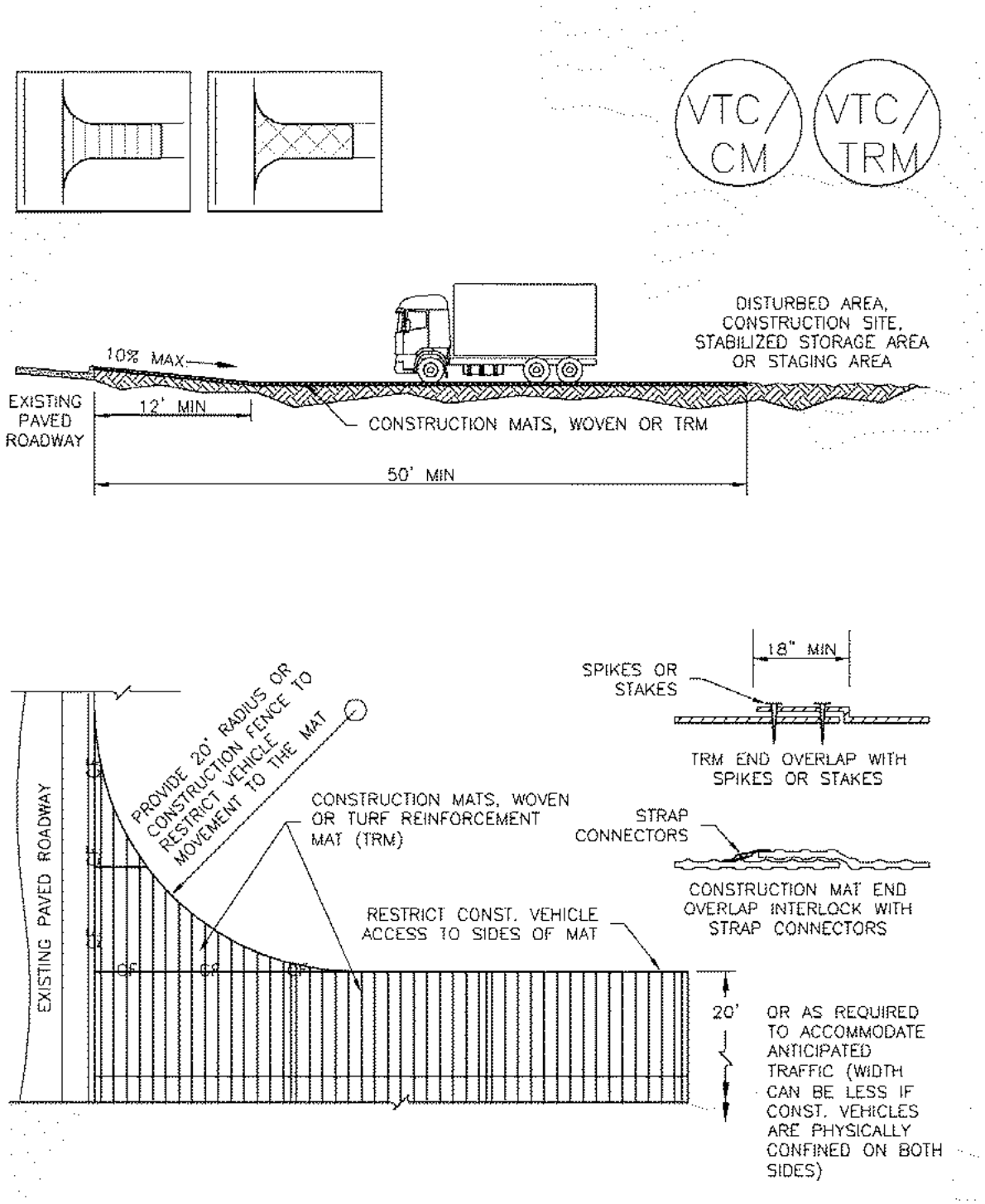
When a construction entrance/exit is removed, excess sediment from the aggregate should be removed and disposed of appropriately. The entrance should be promptly stabilized with a permanent surface following removal, typically by paving.



VTC-1. AGGREGATE VEHICLE TRACKING CONTROL



VTC–2. AGGREGATE VEHICLE TRACKING CONTROL WITH WASH RACK



VTC–3. VEHICLE TRACKING CONTROL W/ CONSTRUCTION MAT OR TURF REINFORCEMENT MAT (TRM)

STABILIZED CONSTRUCTION ENTRANCE/EXIT INSTALLATION NOTES

1. SEE PLAN VIEW FOR
   -LOCATION OF CONSTRUCTION ENTRANCE(S)/EXIT(S).
   -TYPE OF CONSTRUCTION ENTRANCE(S)/EXITS(S) (WITH/WITHOUT WHEEL WASH, CONSTRUCTION MAT OR TRM).

2. CONSTRUCTION MAT OR TRM STABILIZED CONSTRUCTION ENTRANCES ARE ONLY TO BE USED ON SHORT DURATION PROJECTS (TYPICALLY RANGING FROM A WEEK TO A MONTH) WHERE THERE WILL BE LIMITED VEHICULAR ACCESS.

3. A STABILIZED CONSTRUCTION ENTRANCE/EXIT SHALL BE LOCATED AT ALL ACCESS POINTS WHERE VEHICLES ACCESS THE CONSTRUCTION SITE FROM PAVED RIGHT-OF-WAYS.

4. STABILIZED CONSTRUCTION ENTRANCE/EXIT SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.

5. A NON-WOVEN GEOTEXTILE FABRIC SHALL BE PLACED UNDER THE STABILIZED CONSTRUCTION ENTRANCE/EXIT PRIOR TO THE PLACEMENT OF ROCK.

6. UNLESS OTHERWISE SPECIFIED BY LOCAL JURISDICTION, ROCK SHALL CONSIST OF DOT SECT. #703, AASHTO #3 COARSE AGGREGATE OR 6" (MINUS) ROCK.

STABILIZED CONSTRUCTION ENTRANCE/EXIT MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. ROCK SHALL BE REAPPLIED OR REGRADED AS NECESSARY TO THE STABILIZED ENTRANCE/EXIT TO MAINTAIN A CONSISTENT DEPTH.

5. SEDIMENT TRACKED ONTO PAVED ROADS IS TO BE REMOVED THROUGHOUT THE DAY AND AT THE END OF THE DAY BY SHOVELING OR SWEEPING. SEDIMENT MAY NOT BE WASHED DOWN STORM SEWER DRAINS.

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

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

Stabilized Staging Area (SSA) SM-6

Description

A stabilized staging area is a clearly designated area where construction equipment and vehicles, stockpiles, waste bins, and other construction-related materials are stored. The contractor office trailer may also be located in this area. Depending on the size of the construction site, more than one staging area may be necessary.



Photograph SSA-1. Example of a staging area with a gravel surface to prevent mud tracking and reduce runoff. Photo courtesy of Douglas County.

Appropriate Uses

Most construction sites will require a staging area, which should be clearly designated in SWMP drawings. The layout of the staging area may vary depending on the type of construction activity. Staging areas located in roadways due to space constraints require special measures to avoid materials being washed into storm inlets.

Design and Installation

Stabilized staging areas should be completed prior to other construction activities beginning on the site. Major components of a stabilized staging area include:

- Appropriate space to contain storage and provide for loading/unloading operations, as well as parking if necessary.
- A stabilized surface, either paved or covered, with 3-inch diameter aggregate or larger.
- Perimeter controls such as silt fence, sediment control logs, or other measures.
- Construction fencing to prevent unauthorized access to construction materials.
- Provisions for Good Housekeeping practices related to materials storage and disposal, as described in the Good Housekeeping BMP Fact Sheet.
- A stabilized construction entrance/exit, as described in the Vehicle Tracking Control BMP Fact Sheet, to accommodate traffic associated with material delivery and waste disposal vehicles.

Over-sizing the stabilized staging area may result in disturbance of existing vegetation in excess of that required for the project. This increases costs, as well as requirements for long-term stabilization following the construction period. When designing the stabilized staging area, minimize the area of disturbance to the extent practical.

Stabilized Staging Area	
Functions	
Erosion Control	Yes
Sediment Control	Moderate
Site/Material	Yes

Minimizing Long-Term Stabilization Requirements

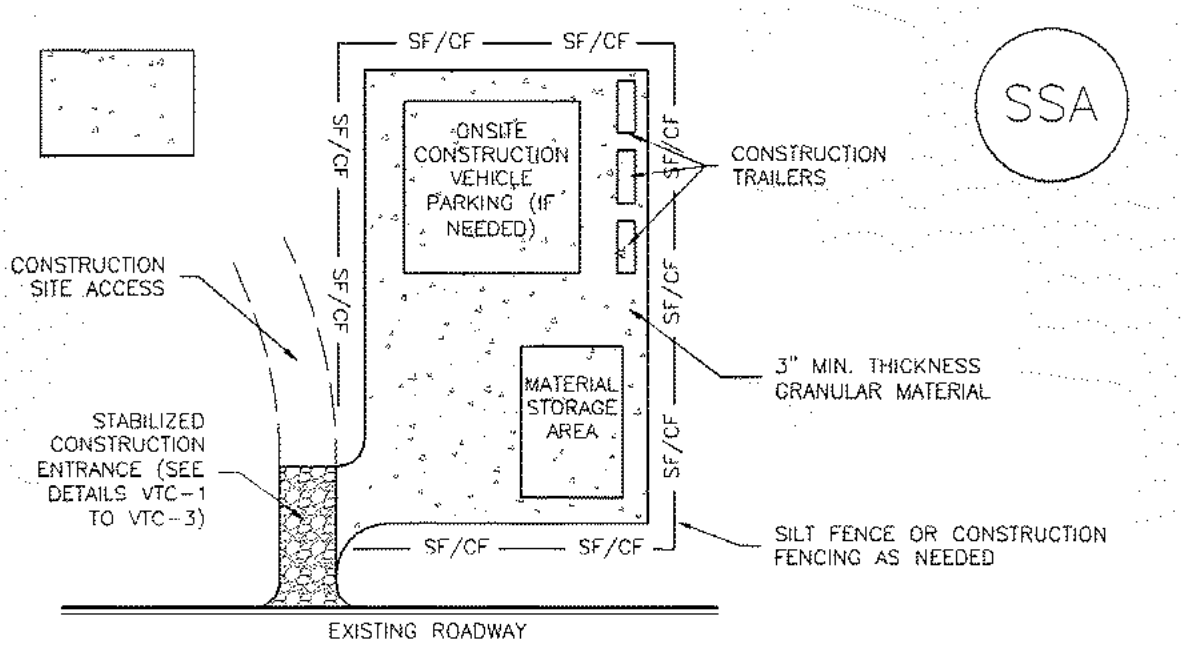
- Utilize off-site parking and restrict vehicle access to the site.
- Use construction mats in lieu of rock when staging is provided in an area that will not be disturbed otherwise.
- Consider use of a bermed contained area for materials and equipment that do not require a stabilized surface.
- Consider phasing of staging areas to avoid disturbance in an area that will not be otherwise disturbed.

See Detail SSA-1 for a typical stabilized staging area and SSA-2 for a stabilized staging area when materials staging in roadways is required.

Maintenance and Removal

Maintenance of stabilized staging areas includes maintaining a stable surface cover of gravel, repairing perimeter controls, and following good housekeeping practices.

When construction is complete, debris, unused stockpiles and materials should be recycled or properly disposed. In some cases, this will require disposal of contaminated soil from equipment leaks in an appropriate landfill. Staging areas should then be permanently stabilized with vegetation or other surface cover planned for the development.



SSA-1. STABILIZED STAGING AREA

STABILIZED STAGING AREA INSTALLATION NOTES

1. SEE PLAN VIEW FOR
   -LOCATION OF STAGING AREA(S).
   -CONTRACTOR MAY ADJUST LOCATION AND SIZE OF STAGING AREA WITH APPROVAL FROM THE LOCAL JURISDICTION.

2. STABILIZED STAGING AREA SHOULD BE APPROPRIATE FOR THE NEEDS OF THE SITE. OVERSIZING RESULTS IN A LARGER AREA TO STABILIZE FOLLOWING CONSTRUCTION.

3. STAGING AREA SHALL BE STABILIZED PRIOR TO OTHER OPERATIONS ON THE SITE.

4. THE STABILIZED STAGING AREA SHALL CONSIST OF A MINIMUM 3" THICK GRANULAR MATERIAL.

5. UNLESS OTHERWISE SPECIFIED BY LOCAL JURISDICTION, ROCK SHALL CONSIST OF DOT SECT. #703, AASHTO #3 COARSE AGGREGATE OR 6" (MINUS) ROCK.

6. ADDITIONAL PERIMETER BMPs MAY BE REQUIRED INCLUDING BUT NOT LIMITED TO SILT FENCE AND CONSTRUCTION FENCING.

STABILIZED STAGING AREA MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. ROCK SHALL BE REAPPLIED OR REGRADED AS NECESSARY IF RUTTING OCCURS OR UNDERLYING SUBGRADE BECOMES EXPOSED.

STABILIZED STAGING AREA MAINTENANCE NOTES

5. STABILIZED STAGING AREA SHALL BE ENLARGED IF NECESSARY TO CONTAIN PARKING, STORAGE, AND UNLOADING/LOADING OPERATIONS.

6. THE STABILIZED STAGING AREA SHALL BE REMOVED AT THE END OF CONSTRUCTION. THE GRANULAR MATERIAL SHALL BE REMOVED OR, IF APPROVED BY THE LOCAL JURISDICTION, USED ON SITE, AND THE AREA COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY LOCAL JURISDICTION.

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

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

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

Temporary Stream Crossing (TSC) SM-10

Description

Where an actively flowing watercourse must be crossed regularly by construction vehicles, a temporary crossing should be provided. Three primary methods are available:

- Culvert crossing
- Stream ford
- Temporary bridge

Culvert crossings and fords are the most commonly used methods. Due to the expense associated with a temporary bridge, these are used primarily on long-term projects.



Photograph TSC-1. A temporary stream crossing using culverts. Photo courtesy of Tom Gore.

Appropriate Uses

Construction vehicles shall be kept out of waterways to the maximum extent practicable. Use a temporary stream crossing when it is absolutely necessary to cross a stream on a construction site. Construct a temporary crossing even if the stream or drainageway is typically dry. Multiple stream crossings should be avoided to minimize environmental impacts.

A permit is required for placement of fill in a waterway under Section 404 of the Clean Water Act. The local office of the U.S. Army Corps of Engineers (USACE) should be contacted concerning the requirements for obtaining a 404 permit. In addition, a permit from the U.S. Fish and Wildlife Service (USFWS) may be needed if endangered species are of concern in the work area. Typically, the USFWS issues are addressed by a 404 permit, if one is required. The municipality of jurisdiction should also be consulted, and can provide assistance. Other permits to be obtained may include a floodplain development permit from the local jurisdiction.

Design and Installation

Design details are provided for these types of stream crossings:

TSC-1. Culvert Crossing

TSC-2. Ford Crossing

TSC-3. Flume Crossing

Temporary Stream Crossing	
Functions	
Erosion Control	Yes
Sediment Control	Yes
Site/Material Management	No

A culvert crossing should be sized appropriately with consideration for the duration of construction and seasonal variation of flows. The sizing methodology provided in the Temporary Diversion Methods Fact Sheet is also appropriate for determining the design flow for temporary stream crossings. Culvert sizing must account for the headwater and tailwater controls to properly size the culvert. For additional discussion on design of box culverts and pipes, see the *Major Drainage* chapter in Volume 1. The designer also needs to confirm that the riprap selected is appropriate for the conditions in the channel being crossed.

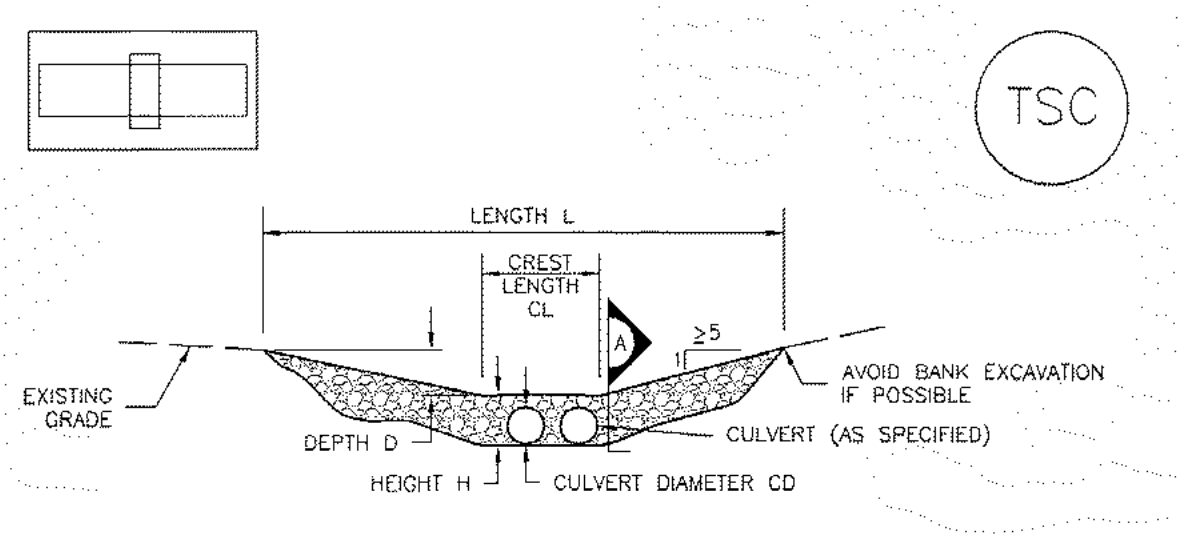
When a ford must be used, namely when a culvert is not practical or the best solution, the ford should be lined with at least a 12-inch thick layer of Type VL (D_{50} = 6 inches) or Type L (D_{50} = 9 inches) riprap with void spaces filed with 1-1/2 inch diameter rock. Ford crossings are recommended primarily for crossings of ephemeral (i.e. intermittently, briefly flowing) streams.

For a temporary bridge crossing, consult with a structural and/or geotechnical engineer for temporary bridge design or consider pre-fabricated alternatives.

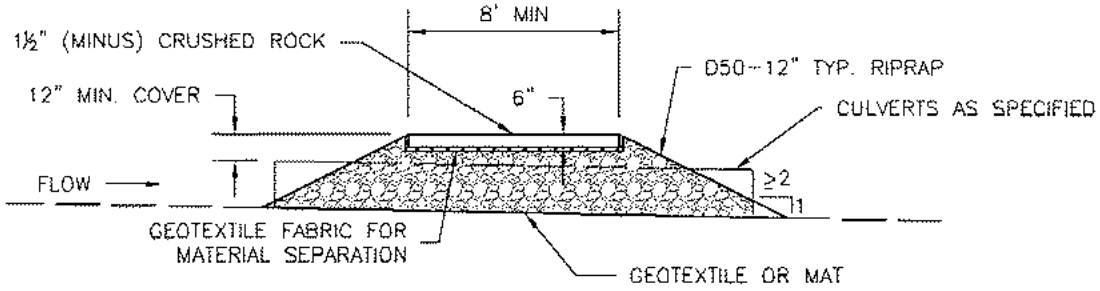
Maintenance and Removal

Inspect stream for bank erosion and in-stream degradation. If bank erosion is occurring, stabilize banks using erosion control practices such as erosion control blankets. If in-stream degradation is occurring, armor the culvert outlet(s) with riprap to dissipate energy. If sediment is accumulating upstream of the crossing, remove excess sediment as needed to maintain the functionality of the crossing.

Remove the temporary crossing when it is no longer needed for construction. Take care to minimize the amount of sediment lost into the stream upon removal. Once the crossing has been removed, stabilize the stream banks with seed and erosion control blankets.

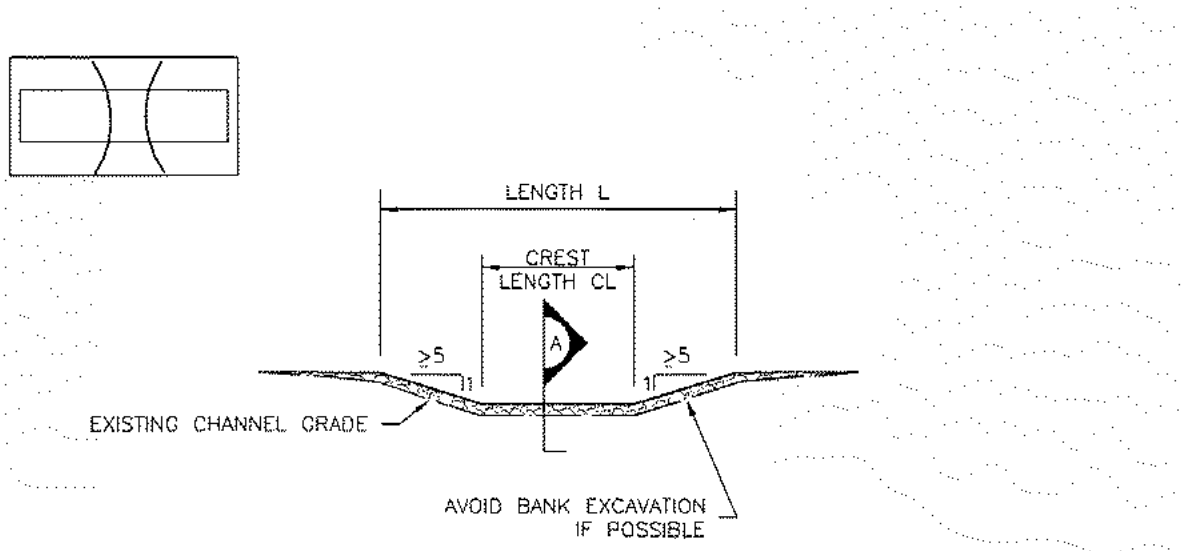


CULVERT CROSSING SECTION

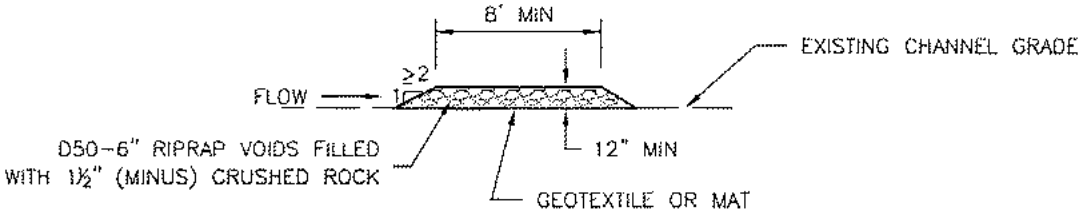


SECTION A

TSC-1. CULVERT CROSSING

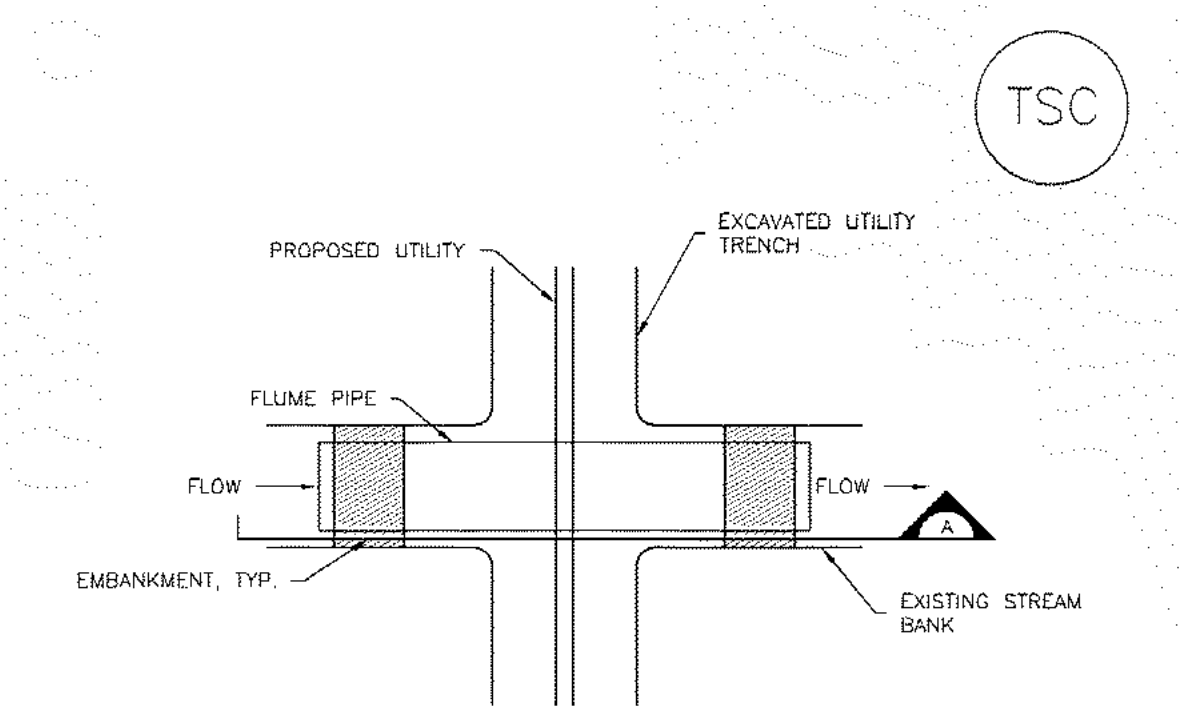


FORD CROSSING SECTION

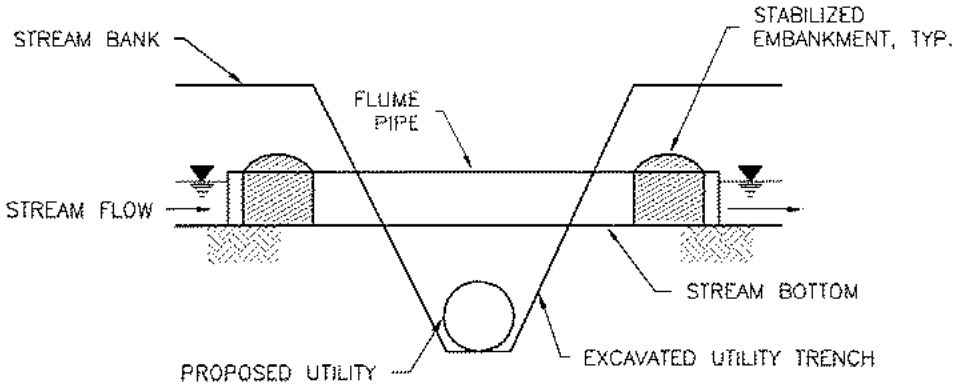


SECTION A

TSC-2. FORD CROSSING



FLUME CROSSING PLAN



SECTION A

TSC-3. FLUME CROSSING

TEMPORARY STREAM CROSSING INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   -LOCATIONS OF TEMPORARY STREAM CROSSINGS.
   -STREAM CROSSING TYPE (FORD, CULVERT, OR FLUME).
   -FOR FORD CROSSING: LENGTH (L), CREST LENGTH (CL), AND DEPTH (D).
   -FOR CULVERT CROSSING: LENGTH (L), CREST LENGTH (CL), CROSSING HEIGHT (H), DEPTH (D), CULVERT DIAMETER (CD), AND NUMBER, TYPE AND CLASS OR GAUGE OF CULVERTS.

2. TEMPORARY STREAM CROSSING DIMENSIONS, D50, AND NUMBER OF CULVERTS INDICATED (FOR CULVERT CROSSING) SHALL BE CONSIDERED MINIMUM DIMENSIONS; ENGINEER MAY ELECT TO INSTALL LARGER FACILITIES. ANY DAMAGE TO STREAM CROSSING OR EXISTING STREAM CHANNEL DURING BASEFLOW OR FLOOD EVENTS SHALL BE PROMPTLY REPAIRED.

3. SEE MAJOR DRAINAGE CHAPTER FOR RIPRAP GRADATIONS.

4. WHERE FAILURE OF A STREAM CROSSING CAN RESULT IN SIGNIFICANT DAMAGE OR HARM IT MUST BE DESIGNED BY A STRUCTURAL ENGINEER.

TEMPORARY STREAM CROSSING MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. REMOVE SEDIMENT ACCUMULATED UPSTREAM OF CROSSING AS NEEDED TO MAINTAIN THE FUNCTIONALITY OF THE CROSSING.

5. STREAM CROSSINGS ARE TO REMAIN IN PLACE UNTIL NO LONGER NEEDED AND SHALL BE REMOVED PRIOR TO THE END OF CONSTRUCTION.

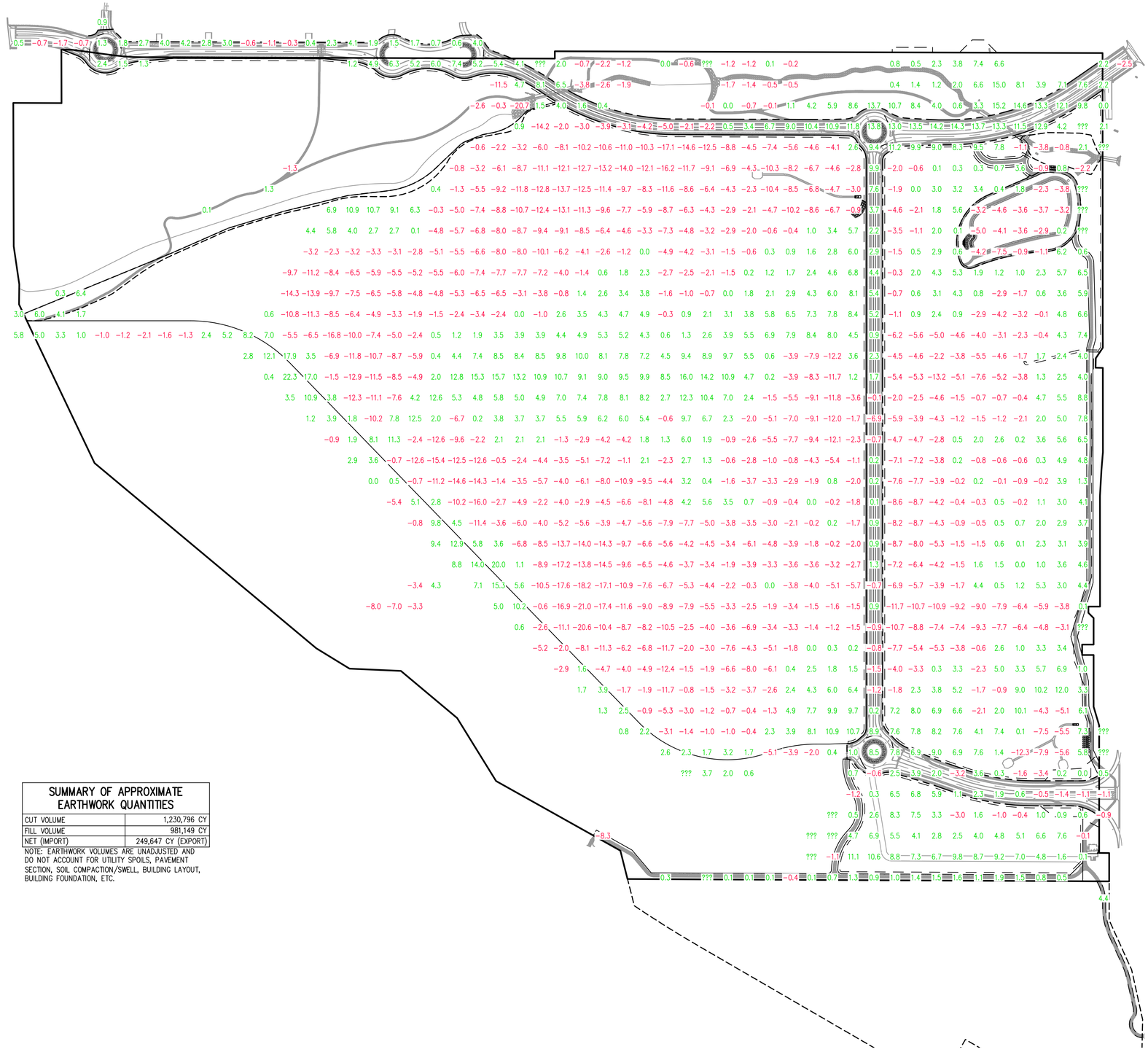
6. WHEN STREAM CROSSINGS ARE REMOVED, THE DISTURBED AREA SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED AND COVERED WITH GEOTEXTILE OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

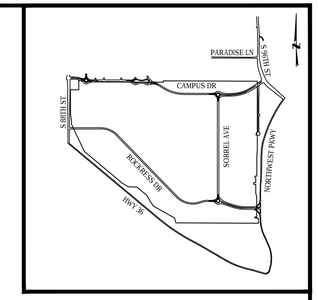
NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

(DETAIL ADAPTED FROM DOUGLAS COUNTY, COLORADO AND CITY OF AURORA, COLORADO (Vol. DSWC), NOT AVAILABLE IN AUTOCAD)

Appendix C – Cut and Fill Map

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH





KEY MAP
1"=2000'

SUMMARY OF APPROXIMATE EARTHWORK QUANTITIES

CUT VOLUME	1,230,796 CY
FILL VOLUME	981,149 CY
NET (IMPORT)	249,647 CY (EXPORT)

NOTE: EARTHWORK VOLUMES ARE UNADJUSTED AND DO NOT ACCOUNT FOR UTILITY SPOILS, PAVEMENT SECTION, SOIL COMPACTION/SWELL, BUILDING LAYOUT, BUILDING FOUNDATION, ETC.

REDTAIL RIDGE TOTAL SITE - CUT & FILL MAP
SCALE: 1" =250'

Depath: P:\19\108 ENGINEERING\EXHIBIT\CUT & FILL MAP - TOTAL SITE.DWG Layout: LAYOUT1
Plotted: WED 03/31/21 2:59:1?P By: Tim Snyder

Appendix D – SWMP Set

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

REDTAIL RIDGE FILING NO. 1

SITUATED IN THE SOUTH HALF OF SECTION 20 AND THE NORTH HALF OF SECTION 29, TOWNSHIP 1 SOUTH, RANGE 69 WEST OF THE SIXTH PRINCIPAL MERIDIAN, CITY OF LOUISVILLE, COUNTY OF BOULDER, STATE OF COLORADO

LEGAL DESCRIPTION:

A PARCEL OF LAND SITUATED IN THE SOUTH HALF OF SECTION 20 AND THE NORTH HALF OF SECTION 29, TOWNSHIP 1 SOUTH, RANGE 69 WEST OF THE SIXTH PRINCIPAL MERIDIAN, CITY OF LOUISVILLE, COUNTY OF BOULDER, STATE OF COLORADO, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE CENTER QUARTER CORNER OF SAID SECTION 20;
THENCE SOUTH 89°48'50" EAST ALONG THE NORTH LINE OF THE SOUTHEAST QUARTER OF SAID SECTION 20, A DISTANCE OF 2,625.59 FEET;
THENCE SOUTH 00°02'13" EAST ALONG A LINE PARALLEL WITH AND 30 FEET WEST OF THE EAST LINE OF THE NORTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SAID SECTION 20, A DISTANCE OF 1,326.76 FEET TO A POINT ON THE SOUTH LINE OF THE NORTH HALF OF SAID SOUTHEAST QUARTER;
THENCE SOUTH 00°02'35" EAST ALONG A LINE PARALLEL WITH AND 30 FEET WEST OF THE EAST LINE OF THE SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SAID SECTION 20, A DISTANCE OF 85.45 FEET TO THE NORTH CORNER OF PARCEL TK-71-2 DESCRIBED AT RECEPTION NO. 2386686 IN THE RECORDS OF BOULDER COUNTY;
THENCE ALONG THE PERIMETER OF SAID PARCEL THE FOLLOWING THREE (3) COURSES:
1) SOUTH 33°27'26" WEST, A DISTANCE OF 60.64 FEET;
2) SOUTH 01°40'28" WEST, A DISTANCE OF 45.12 FEET;
3) SOUTH 88°19'32" EAST, A DISTANCE OF 34.84 FEET TO A POINT 30 FEET WEST OF SAID EAST LINE;
THENCE SOUTH 00°02'35" EAST ALONG A LINE PARALLEL WITH AND 30 FEET WEST OF SAID EAST LINE, A DISTANCE OF 404.28 FEET TO A POINT OF NON-TANGENT CURVATURE AT THE NORTH CORNER OF PARCEL TK-71 DESCRIBED AT RECEPTION NO. 2309730 IN THE RECORDS OF BOULDER COUNTY;
THENCE ALONG THE PERIMETER OF SAID PARCEL THE FOLLOWING THREE (3) COURSES:
1) ALONG THE ARC OF SAID CURVE TO THE LEFT AN ARC LENGTH OF 86.28 FEET, SAID CURVE HAVING A RADIUS OF 2,441.83 FEET, A CENTRAL ANGLE OF 02°01'28", AND A CHORD WHICH BEARS SOUTH 04°26'27" WEST A CHORD DISTANCE OF 86.27 FEET;
2) SOUTH 03°25'43" WEST, A DISTANCE OF 124.37 FEET;
3) SOUTH 00°02'35" EAST AND ALONG THE WEST LINE OF PARCEL TK-71-1 DESCRIBED AT RECEPTION NO. 2309730 IN THE RECORDS OF BOULDER COUNTY, A DISTANCE OF 529.71 FEET TO A POINT ON THE SOUTH LINE OF THE SAID SOUTHEAST QUARTER AND A POINT ON THE NORTH LINE OF PARCEL 12 AS DESCRIBED AT RECEPTION NO. 1560711 IN THE RECORDS OF BOULDER COUNTY;
THENCE ALONG THE PERIMETER OF SAID PARCEL 12 THE FOLLOWING FOUR (4) COURSES:
1) NORTH 89°42'42" WEST, A DISTANCE OF 55.73 FEET;
2) SOUTH 00°00'35" WEST, A DISTANCE OF 30.02 FEET;
3) SOUTH 44°51'26" EAST, A DISTANCE OF 35.44 FEET;
4) SOUTH 00°00'35" WEST, A DISTANCE OF 127.21 FEET TO A POINT ON THE NORTH LINE OF THAT PARCEL DESCRIBED AT RECEPTION NO. 520800 IN THE RECORDS OF BOULDER COUNTY;
THENCE ALONG THE PERIMETER OF SAID PARCEL THE FOLLOWING THREE (3) COURSES:
1) NORTH 89°59'25" WEST, A DISTANCE OF 55.00 FEET;
2) SOUTH 00°00'35" WEST, A DISTANCE OF 50.00 FEET;
3) SOUTH 89°59'25" EAST, A DISTANCE OF 55.00 FEET TO THE NORTHWEST CORNER OF PARCEL 10 AS DESCRIBED AT RECEPTION NO. 1560711 IN THE RECORDS OF BOULDER COUNTY;
THENCE ALONG THE PERIMETER OF SAID PARCEL 10 THE FOLLOWING TWO (2) COURSES:
1) SOUTH 00°00'35" WEST ALONG THE WEST LINE OF SAID PARCEL AND ALONG A LINE PARALLEL WITH AND 75 FEET WEST OF THE SAID EAST LINE, A DISTANCE OF 247.79 FEET;
2) SOUTH 16°40'03" EAST ALONG THE SOUTHEASTERLY LINE OF SAID PARCEL, A DISTANCE OF 93.77 FEET TO THE NORTH CORNER OF PARCEL TK-75 DESCRIBED AT RECEPTION NO. 2309730 IN THE RECORDS OF BOULDER COUNTY;
THENCE SOUTH 00°00'35" WEST ALONG A LINE PARALLEL WITH THE EAST LINE OF SAID SECTION 29 AND ALONG THE WEST LINE OF SAID TK-75, A DISTANCE OF 611.12 FEET;
THENCE SOUTH 89°48'45" EAST ALONG THE SOUTH LINE OF SAID TK-75, A DISTANCE OF 48.09 FEET TO A POINT ON THE EAST LINE OF THE NORTHEAST QUARTER OF SAID SECTION 29;
THENCE SOUTH 00°00'35" WEST ALONG SAID EAST LINE, A DISTANCE OF 136.13 FEET TO A POINT ON THE SOUTH LINE OF THE NORTH HALF OF THE NORTHEAST QUARTER OF SAID SECTION 29;
THENCE NORTH 89°42'42" WEST ALONG SAID SOUTH LINE, A DISTANCE OF 2,308.62 FEET TO A POINT ON THE NORTHEAST LINE OF THE LAND CONVEYED TO THE CITY OF BROOMFIELD BY GIFT DEED RECORDED AT RECEPTION NO. 2013403 IN THE RECORDS OF BOULDER COUNTY;
THENCE ALONG THE PERIMETER OF SAID PARCEL THE FOLLOWING FIVE (5) COURSES:
1) NORTH 14°13'32" WEST, A DISTANCE OF 140.04 FEET;
2) NORTH 60°44'04" WEST, A DISTANCE OF 682.66 FEET;
3) NORTH 31°43'59" WEST, A DISTANCE OF 355.27 FEET;
4) NORTH 50°04'57" WEST, A DISTANCE OF 351.37 FEET;
5) NORTH 87°28'56" WEST, A DISTANCE OF 246.66 FEET TO THE EASTERN CORNER OF PARCEL 32B AS DESCRIBED BY SPECIAL WARRANTY DEED RECORDED AT RECEPTION NO. 3411796 IN THE RECORDS OF BOULDER COUNTY;
THENCE NORTH 58°29'24" WEST ALONG THE NORTHEASTERLY LINE OF SAID PARCEL, A DISTANCE OF 186.70 FEET TO A POINT ON THE RIGHT-OF-WAY OF HIGHWAY 36;
THENCE NORTH 50°07'12" WEST ALONG SAID RIGHT-OF-WAY, A DISTANCE OF 356.68 FEET TO A POINT ON THE SOUTH LINE OF THE SOUTHWEST QUARTER OF SAID SECTION 20 AND THE SOUTH CORNER OF PARCEL 32A OF SAID SPECIAL WARRANTY DEED;
THENCE CONTINUING NORTH 50°07'12" WEST ALONG THE NORTHEAST LINE OF SAID PARCEL 32A, A DISTANCE OF 1,028.45 FEET TO A POINT ON THE EAST LINE OF THAT PARCEL DESCRIBED AT BOOK 880, PAGE 98 IN THE RECORDS OF BOULDER COUNTY;
THENCE NORTH 25°26'59" WEST ALONG SAID EAST LINE AND ALONG THE EAST LINE OF THAT PARCEL DESCRIBED AT BOOK 878, PAGE 503, A DISTANCE OF 842.57 TO THE SOUTH CORNER OF THAT PARCEL DESCRIBED AT RECEPTION NO. 1989419 IN THE RECORDS OF BOULDER COUNTY;
THENCE ALONG THE PERIMETER OF SAID PARCEL THE FOLLOWING FOUR (4) COURSES:
1) NORTH 00°54'00" EAST, A DISTANCE OF 95.53 FEET;
2) NORTH 08°22'46" WEST, A DISTANCE OF 184.53 FEET;
3) NORTH 00°09'09" WEST ALONG A LINE PARALLEL WITH THE WEST LINE OF THE SOUTHWEST QUARTER OF SAID SECTION 20, A DISTANCE OF 213.70 FEET;
4) SOUTH 89°50'51" WEST, A DISTANCE OF 34.06 FEET TO A POINT 25.00 FEET EAST OF THE WEST LINE OF SAID SOUTHWEST QUARTER;
THENCE NORTH 00°09'09" WEST ALONG A LINE PARALLEL WITH AND 25 FEET FROM THE SAID WEST LINE, A DISTANCE OF 473.64 FEET TO A POINT ON THE SOUTH LINE OF THAT PARCEL DESCRIBED AT RECEPTION NO. 1819920 IN THE RECORDS OF BOULDER COUNTY EXTENDED WESTERLY;
THENCE SOUTH 89°48'38" EAST ALONG SAID SOUTH LINE AND SAID SOUTH LINE EXTENDED, A DISTANCE OF 265.23 FEET TO THE SOUTHEAST CORNER OF SAID PARCEL;
THENCE NORTH 00°09'09" WEST ALONG THE EAST LINE OF SAID PARCEL, A DISTANCE OF 256.00 FEET TO A POINT ON THE SOUTH RIGHT-OF-WAY LINE OF CAMPUS DRIVE AS DEDICATED BY LOUISVILLE CAMPUS RECORDED AT RECEPTION NO. 1669751;
THENCE ALONG SAID SOUTH LINE THE FOLLOWING FOUR (4) COURSES:
1) SOUTH 89°48'38" EAST ALONG SAID NORTH LINE, A DISTANCE OF 50.02 FEET;
2) SOUTH 82°25'28" EAST, A DISTANCE OF 202.23 FEET TO A POINT OF NON-TANGENT CURVATURE;
3) ALONG THE ARC OF SAID CURVE TO THE LEFT AN ARC LENGTH OF 139.86 FEET, SAID CURVE HAVING A RADIUS OF 1,085.00 FEET, A CENTRAL ANGLE OF 07°23'09", AND A CHORD WHICH BEARS SOUTH 86°07'04" EAST A CHORD DISTANCE OF 139.77 FEET;
4) SOUTH 89°48'38" EAST, A DISTANCE OF 1,975.05 FEET TO A POINT ON THE EAST LINE SAID SOUTHWEST QUARTER;
THENCE NORTH 00°02'50" EAST ALONG SAID EAST LINE, A DISTANCE OF 35.00 FEET TO THE POINT OF BEGINNING;

EXCEPTING THEREFROM THAT PARCEL CONVEYED TO PUBLIC SERVICE COMPANY OF COLORADO BY DEED RECORDED AT RECEPTION NO. 531604.

SAID PARCEL CONTAINS 16,949,252 SQUARE FEET OR 389.10 ACRES, MORE OR LESS.

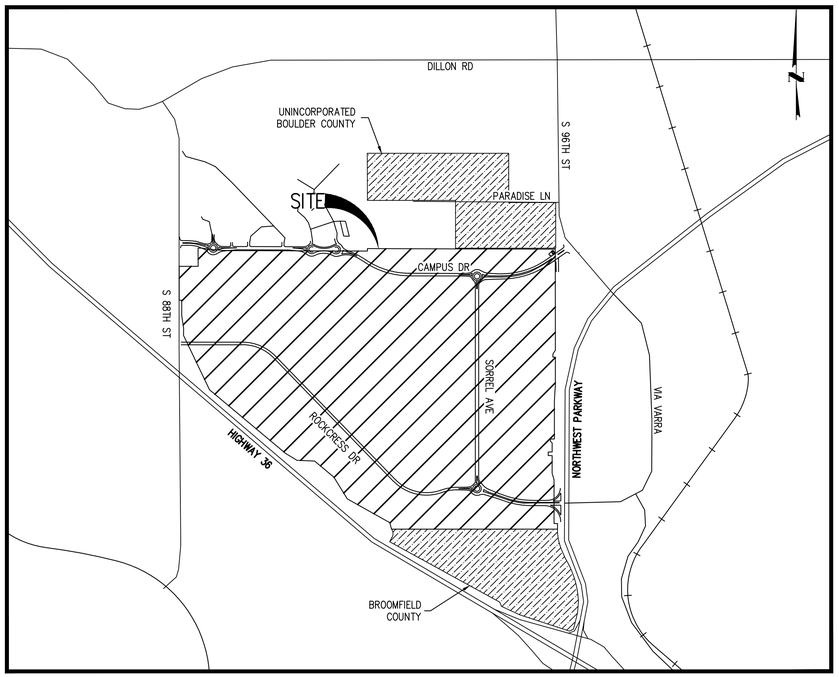
BASIS OF BEARINGS:

BEARINGS ARE BASED ON THE WEST LINE OF THE NORTHEAST QUARTER OF SECTION 29, TOWNSHIP 1 SOUTH, RANGE 69 WEST OF THE 6TH PRINCIPAL MERIDIAN ASSUMED AS BEARING SOUTH 00°08'41" EAST.

BENCHMARK:

THE SITE VERTICAL BENCHMARK IS GPS CONTROL POINT FC-1 OF THE CITY AND COUNTY OF BROOMFIELD. FC-1 IS LOCATED AT THE SOUTHWEST END OF THE STORAGE TEK DRIVE BRIDGE, 64.3' NORTH OF THE US 36 EXIT RAMP. THE 3" ROUND CAP DESCRIBED IN THE CITY AND COUNTY OF BROOMFIELD SURVEY SHEET WAS MISSING AT THE TIME OF THIS SURVEY, BUT A MAG NAIL WAS FOUND IN ITS PLACE IN A COUNTERSINK HOLE IN THE SIDEWALK. THE NAIL WAS USED IN PLACE OF THE ORIGINAL MONUMENT, AND ASSIGNED AN ELEVATION OF 5392.57, NAVD 88.

STORMWATER MANAGEMENT PLAN



VICINITY MAP
SCALE: 1"=1000'

SUMMARY OF APPROXIMATE EARTHWORK QUANTITIES	
CUT VOLUME	1,230,796 CY
FILL VOLUME	981,149 CY
NET (IMPORT)	249,647 CY (EXPORT)
AREA OF DISTURBANCE	316 ACRES

NOTE: EARTHWORK VOLUMES ARE UNADJUSTED AND DO NOT ACCOUNT FOR UTILITY SPOILS, PAVEMENT SECTION, SOIL COMPACTION/SWELL, ETC.

ABBREVIATIONS	
BK	BOOK
CONC	CONCRETE
E	EAST, EASTING
EL	ELEVATION
ESMT	EASEMENT
EX	EXISTING
FES	FLARED END SECTION
FH	FIRE HYDRANT
FL	FLOW LINE
HP	HIGH POINT
INV	INVERT
LP	LOW POINT
LSD	LANDSCAPE DRAIN
MH	MANHOLE
N	NORTH, NORTHING
NO	NUMBER
PG	PAGE
PR	PROPOSED
PSCO	PUBLIC SERVICE COMPANY OF COLORADO
REC	RECEPTION
ROW	RIGHT OF WAY
SS	SANITARY SEWER
STA	STATION
STM	STORM
TYP	TYPICAL
WAT	WATER

STORMWATER MANAGEMENT PLANS

ES - 1	SWMP - COVER
ES - 2	SWMP - INITIAL - R1 C1
ES - 3	SWMP - INITIAL - R1 C2
ES - 4	SWMP - INITIAL - R1 C3
ES - 5	SWMP - INITIAL - R1 C4
ES - 6	SWMP - INITIAL - R1 C5
ES - 7	SWMP - INITIAL - R2 C1
ES - 8	SWMP - INITIAL - R2 C2
ES - 9	SWMP - INITIAL - R2 C3
ES - 10	SWMP - INITIAL - R2 C4
ES - 11	SWMP - INITIAL - R2 C5
ES - 12	SWMP - INITIAL - R3 C1
ES - 13	SWMP - INITIAL - R3 C2
ES - 14	SWMP - INITIAL - R3 C3
ES - 15	SWMP - INITIAL - R3 C4
ES - 16	SWMP - INITIAL - R3 C5
ES - 17	SWMP - INITIAL - R4 C1
ES - 18	SWMP - INITIAL - R4 C2
ES - 19	SWMP - INITIAL - R4 C3
ES - 20	SWMP - INITIAL - R4 C4
ES - 21	SWMP - INITIAL - R4 C5
ES - 22	SWMP - INITIAL - R5 C2
ES - 23	SWMP - INITIAL - R5 C3
ES - 24	SWMP - INITIAL - R5 C4
ES - 25	SWMP - INITIAL - R5 C5
ES - 26	SWMP - INITIAL - R6 C3
ES - 27	SWMP - INITIAL - R6 C4
ES - 28	SWMP - INITIAL - R6 C5
ES - 29	SWMP - INITIAL - R7 C5
ES - 30	SWMP - INTERIM - R1 C1
ES - 31	SWMP - INTERIM - R1 C2
ES - 32	SWMP - INTERIM - R1 C3
ES - 33	SWMP - INTERIM - R1 C4
ES - 34	SWMP - INTERIM - R1 C5
ES - 35	SWMP - INTERIM - R2 C1
ES - 36	SWMP - INTERIM - R2 C2
ES - 37	SWMP - INTERIM - R2 C3
ES - 38	SWMP - INTERIM - R2 C4
ES - 39	SWMP - INTERIM - R2 C5
ES - 40	SWMP - INTERIM - R3 C1
ES - 41	SWMP - INTERIM - R3 C2
ES - 42	SWMP - INTERIM - R3 C3
ES - 43	SWMP - INTERIM - R3 C4
ES - 44	SWMP - INTERIM - R3 C5
ES - 45	SWMP - INTERIM - R4 C1
ES - 46	SWMP - INTERIM - R4 C2
ES - 47	SWMP - INTERIM - R4 C3
ES - 48	SWMP - INTERIM - R4 C4
ES - 49	SWMP - INTERIM - R4 C5
ES - 50	SWMP - INTERIM - R5 C2
ES - 51	SWMP - INTERIM - R5 C3
ES - 52	SWMP - INTERIM - R5 C4
ES - 53	SWMP - INTERIM - R5 C5
ES - 54	SWMP - INTERIM - R6 C3
ES - 55	SWMP - INTERIM - R6 C4
ES - 56	SWMP - INTERIM - R6 C5
ES - 57	SWMP - INTERIM - R7 C5
ES - 58	SWMP - FINAL - R1 C1
ES - 59	SWMP - FINAL - R1 C2
ES - 60	SWMP - FINAL - R1 C3
ES - 61	SWMP - FINAL - R1 C4
ES - 62	SWMP - FINAL - R1 C5
ES - 63	SWMP - FINAL - R2 C1
ES - 64	SWMP - FINAL - R2 C2
ES - 65	SWMP - FINAL - R2 C3
ES - 66	SWMP - FINAL - R2 C4
ES - 67	SWMP - FINAL - R2 C5
ES - 68	SWMP - FINAL - R3 C1
ES - 69	SWMP - FINAL - R3 C2
ES - 70	SWMP - FINAL - R3 C3
ES - 71	SWMP - FINAL - R3 C4
ES - 72	SWMP - FINAL - R3 C5
ES - 73	SWMP - FINAL - R4 C1
ES - 74	SWMP - FINAL - R4 C2
ES - 75	SWMP - FINAL - R4 C3
ES - 76	SWMP - FINAL - R4 C4
ES - 77	SWMP - FINAL - R4 C5
ES - 78	SWMP - FINAL - R5 C2
ES - 79	SWMP - FINAL - R5 C3
ES - 80	SWMP - FINAL - R5 C4
ES - 81	SWMP - FINAL - R5 C5
ES - 82	SWMP - FINAL - R6 C3
ES - 83	SWMP - FINAL - R6 C4
ES - 84	SWMP - FINAL - R6 C5
ES - 85	SWMP - FINAL - R7 C5
ES - 86	SWMP - DETAILS
ES - 87	SWMP - DETAILS
ES - 88	SWMP - DETAILS
ES - 89	SWMP - DETAILS
ES - 90	SWMP - DETAILS
ES - 91	SWMP - DETAILS

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DEVELOPER
BRUE·BAUKOL CAPITAL PARTNERS

ENGINEER/SURVEYOR
HARRIS KOCHER SMITH
1120 Lincoln Street, Suite 1000
Denver, Colorado 80203
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HarrisKocherSmith.com

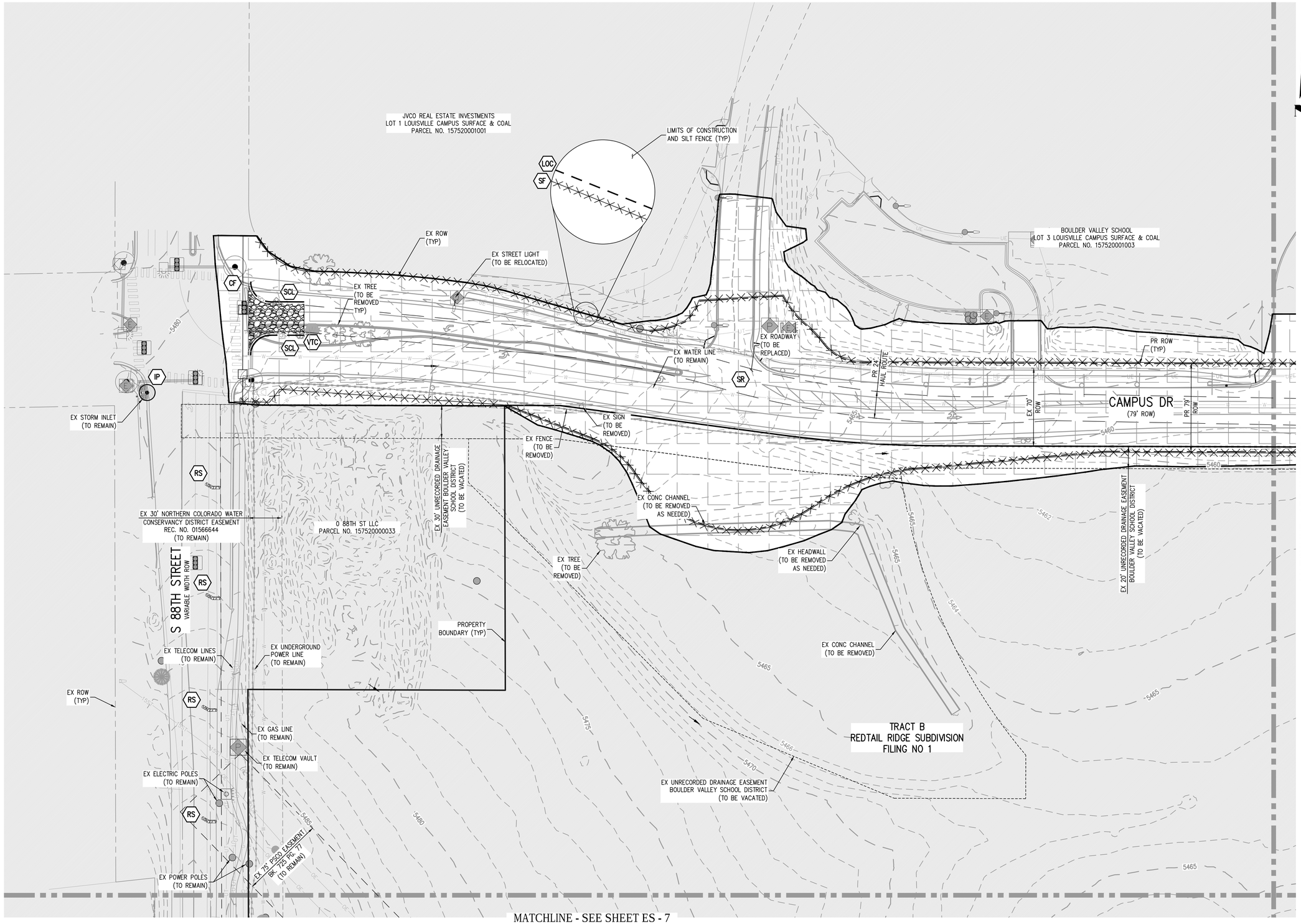
ISSUE DATE: 11-15-2019	PROJECT #: 190108
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

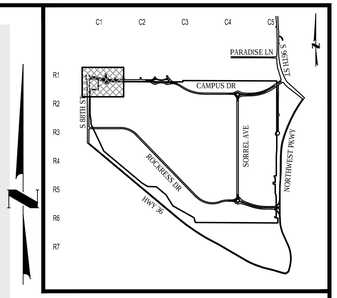
PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 1
ES - 1 OF ES - 91

Filepath: P:\190108\ENGINEERING\EROSION\SWMP - COVER.DWG Layout: LAYOUT1
Last Edit: Tim Sayler
Plotted: THU, 04/01/21 10:39:53A By: Tim Sayler

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KEY MAP
1"=2000'

NOTES:

1. ALL EXISTING SURFACE FEATURES NOT INCLUDED WITHIN FILING NO. 1 ARE TO REMAIN UNLESS OTHERWISE NOTED. SEE SHEETS MASTER UTILITY AND SURFACE IMPROVEMENTS PLAN FOR PHASING.
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LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS
- EXISTING WATER LINE
- EXISTING STORM MAIN
- EXISTING SANITARY SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING OVERHEAD ELECTRIC
- EXISTING UNDERGROUND TELECOM
- CHECK DAM
- CONSTRUCTION FENCE
- COFFERDAM
- CULVERT PROTECTION
- CONSTRUCTION TRAILER
- CONCRETE WASHOUT AREA
- INLET PROTECTION
- LIMITS OF CONSTRUCTION
- OUTLET PROTECTION
- ROUGH CUT STREET CONTROL
- ROCK SOCK
- SEDIMENT CONTROL LOG
- SILT FENCE
- SEEDING AND MULCHING
- SOIL STOCKPILE
- SURFACE ROUGHENGING
- STABILIZED STAGING AREA
- VEHICLE TRACKING CONTROL
- TEMPORARY STREAM CROSSING
- EXISTING STORM SEWER
- UNDISTURBED AREA
- RUNOFF ARROWS

MATCHLINE - SEE SHEET ES - 3

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40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

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BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INITIAL - R1 C1

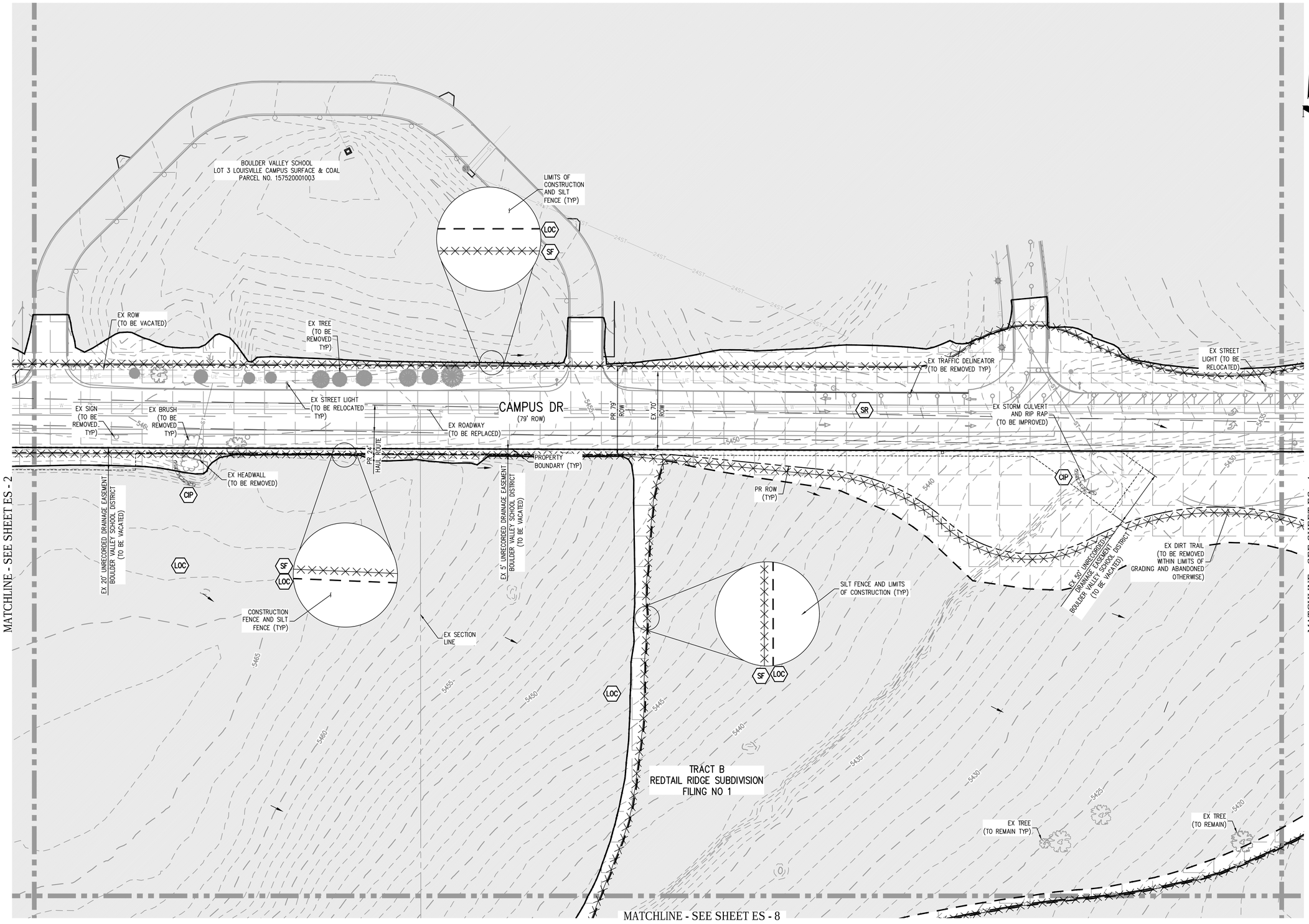
ISSUE DATE: 11-15-2019	PROJECT #: 190108
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04-05-2021	FIRST SUBMITTAL NEW PROGRAM

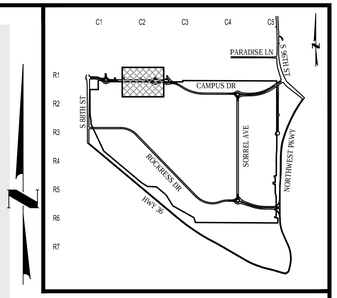
PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 2
ES - 2 OF ES - 91

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PLOTTED: TIR(04/01/21 10:40:23A BY: TIM SAVLER

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LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS
- EXISTING WATER LINE
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- EXISTING OVERHEAD ELECTRIC
- EXISTING UNDERGROUND TELECOM
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BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INITIAL - R1 C2

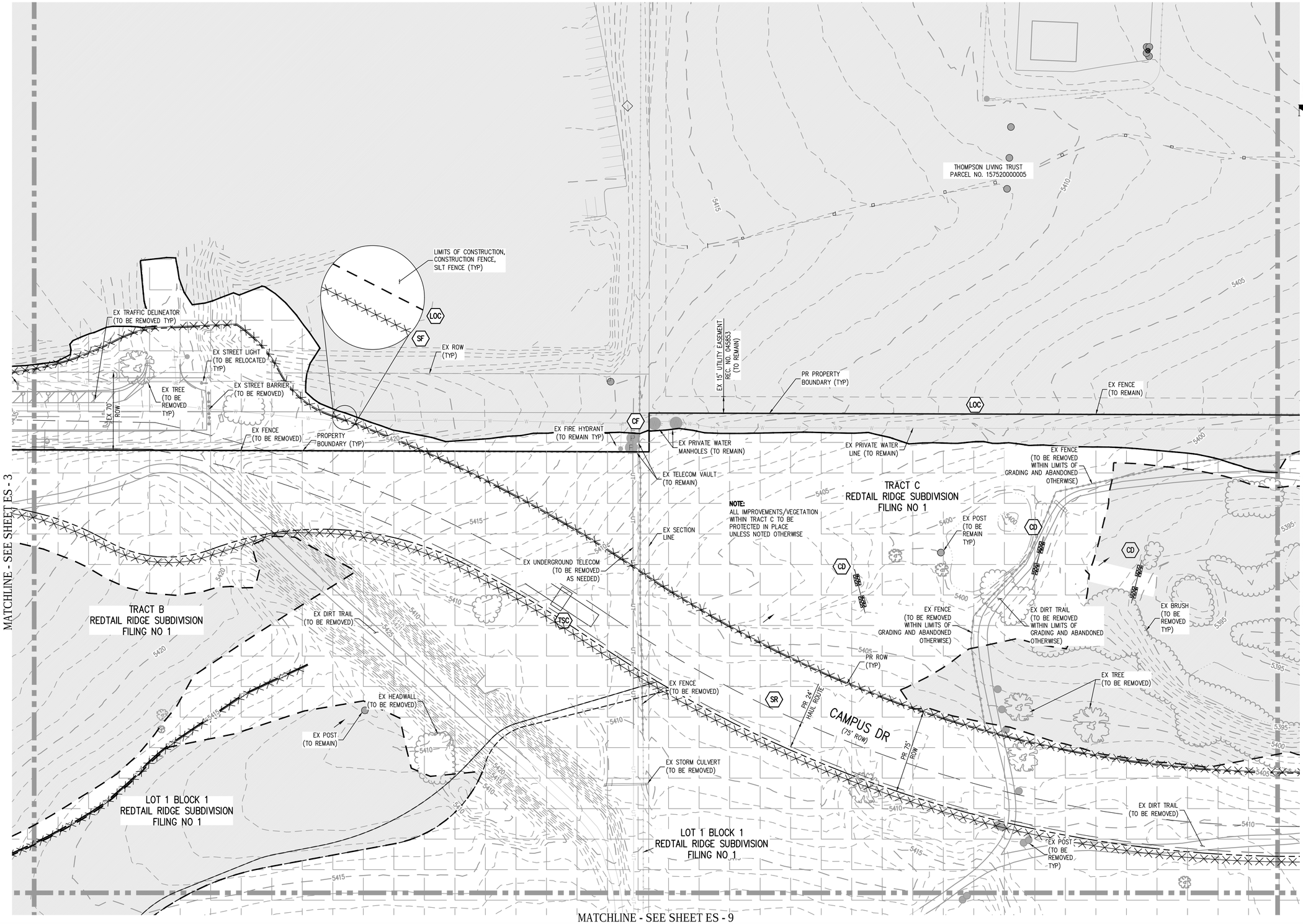
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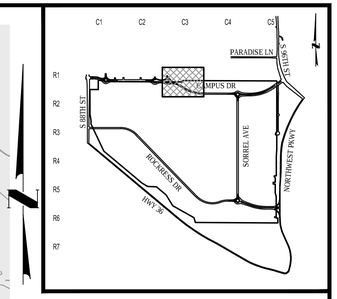
PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 3
ES - 3 OF ES - 91

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PLOTTED: TIR| 04/01/21 10:40:37A BY: TIM SAYLER

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LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS (5264 / 5265)
- W — EXISTING WATER LINE
- ST — EXISTING STORM MAIN
- SS — EXISTING SANITARY SEWER
- UE — EXISTING UNDERGROUND ELECTRIC
- OE — EXISTING OVERHEAD ELECTRIC
- UT — EXISTING UNDERGROUND TELECOM
- CD — CHECK DAM
- CF — CONSTRUCTION FENCE
- CFD — COFFERDAM
- CP — CULVERT PROTECTION
- CT — CONSTRUCTION TRAILER
- CWA — CONCRETE WASHOUT AREA
- IP — INLET PROTECTION
- LOC — LIMITS OF CONSTRUCTION
- OP — OUTLET PROTECTION
- RCS — ROUGH CUT STREET CONTROL
- RS — ROCK SOCK
- SCL — SEDIMENT CONTROL LOG
- SF — SILT FENCE
- SM — SEEDING AND MULCHING
- SP — SOIL STOCKPILE
- SR — SURFACE ROUGHENING
- SSA — STABILIZED STAGING AREA
- VTC — VEHICLE TRACKING CONTROL
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40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

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HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INITIAL - R1 C3

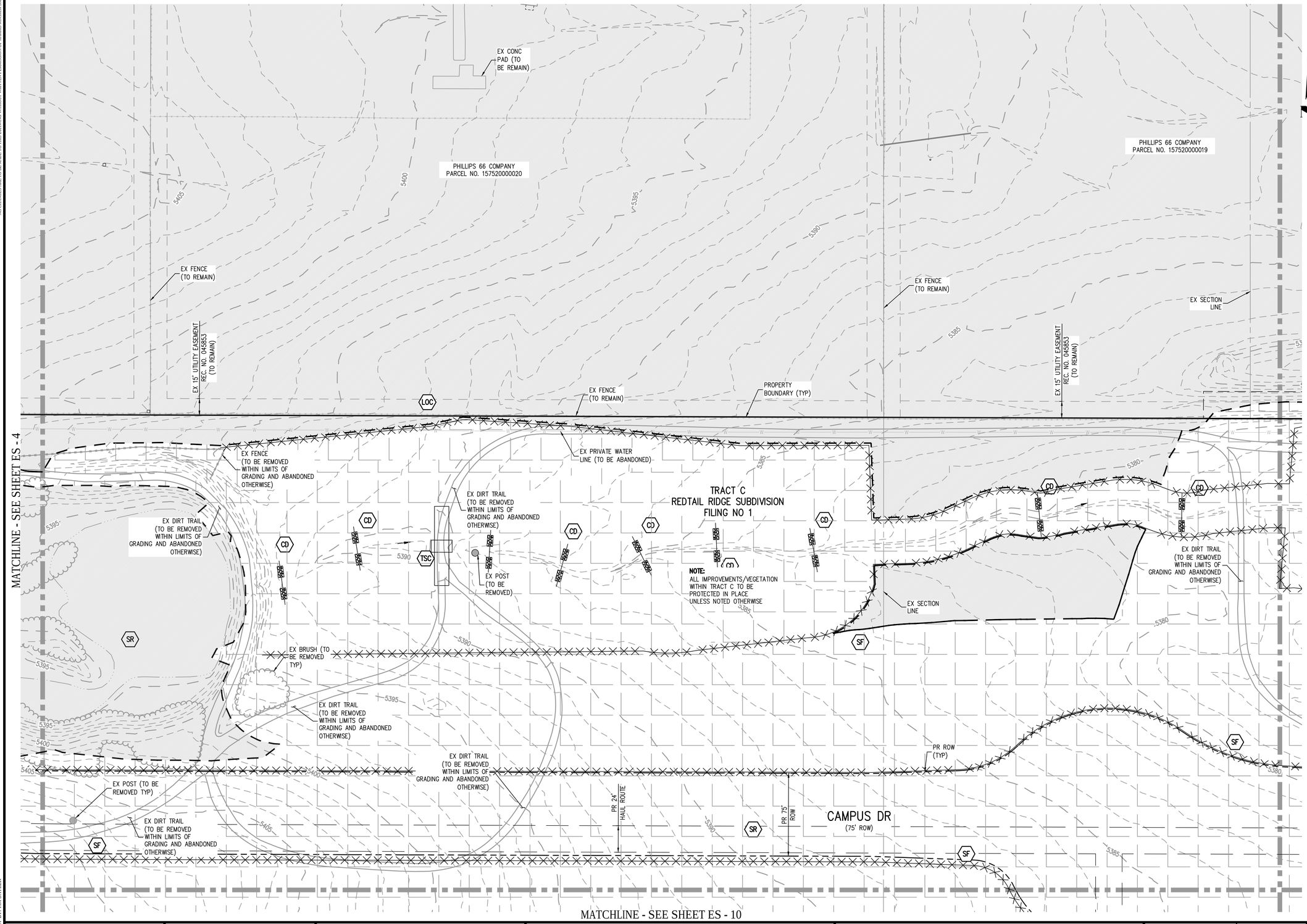
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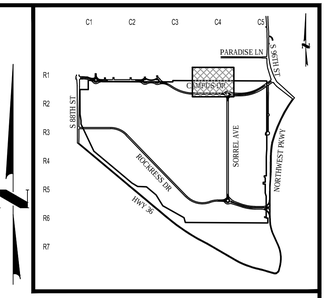
PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 4
ES - 4 OF ES - 91

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PLOTTED: THU 04/01/21 10:40:50A BY: TIM SAYLER

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BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INITIAL - R1 C4

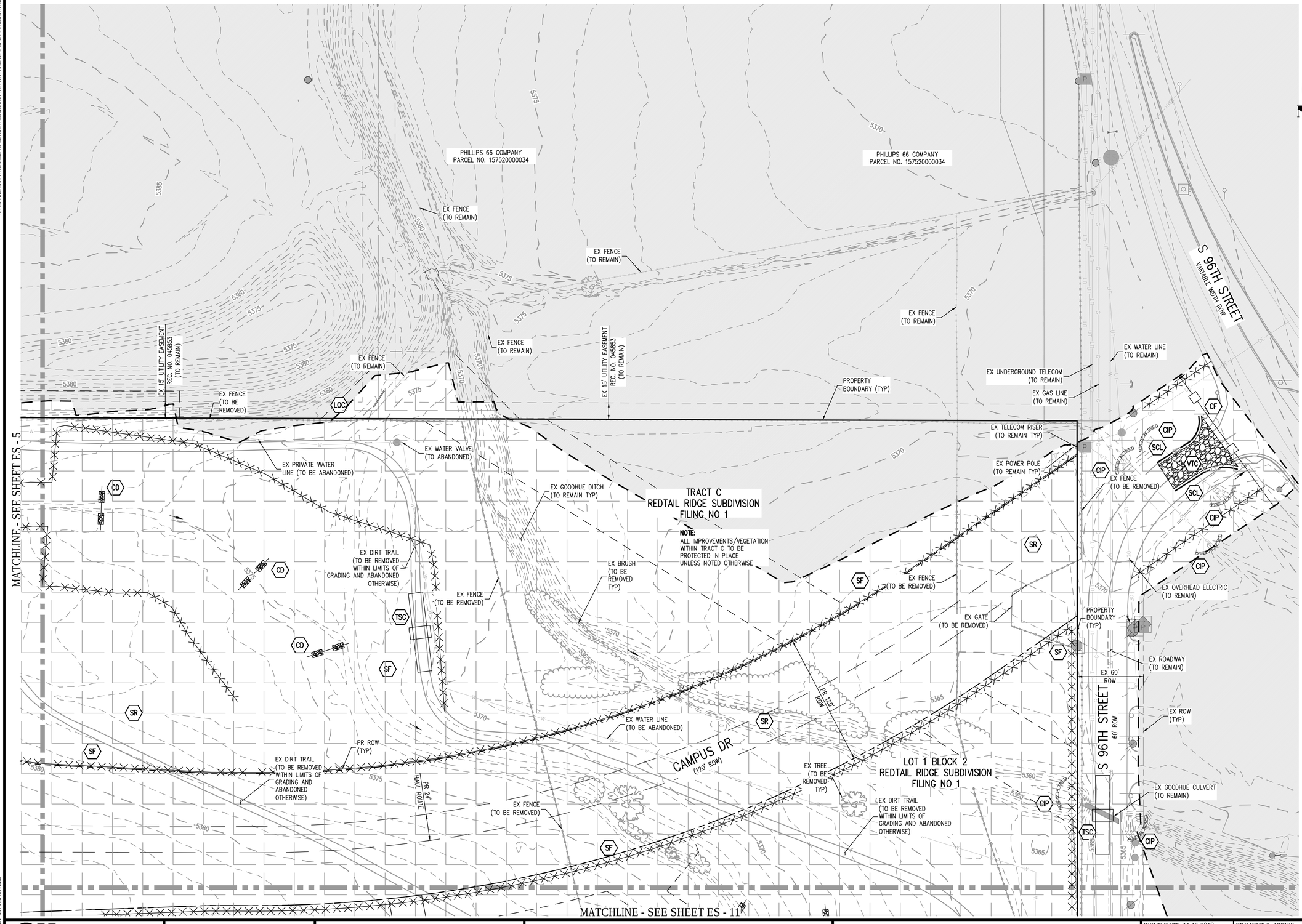
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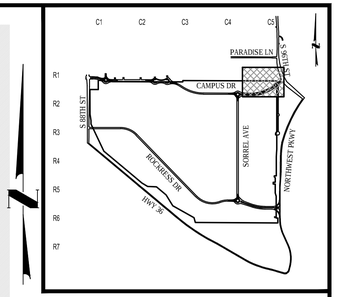
PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 5
ES - 5 OF ES - 91

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- EXISTING STORM MAIN
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BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INITIAL - R1 C5

ISSUE DATE: 11-15-2019	PROJECT #: 190108
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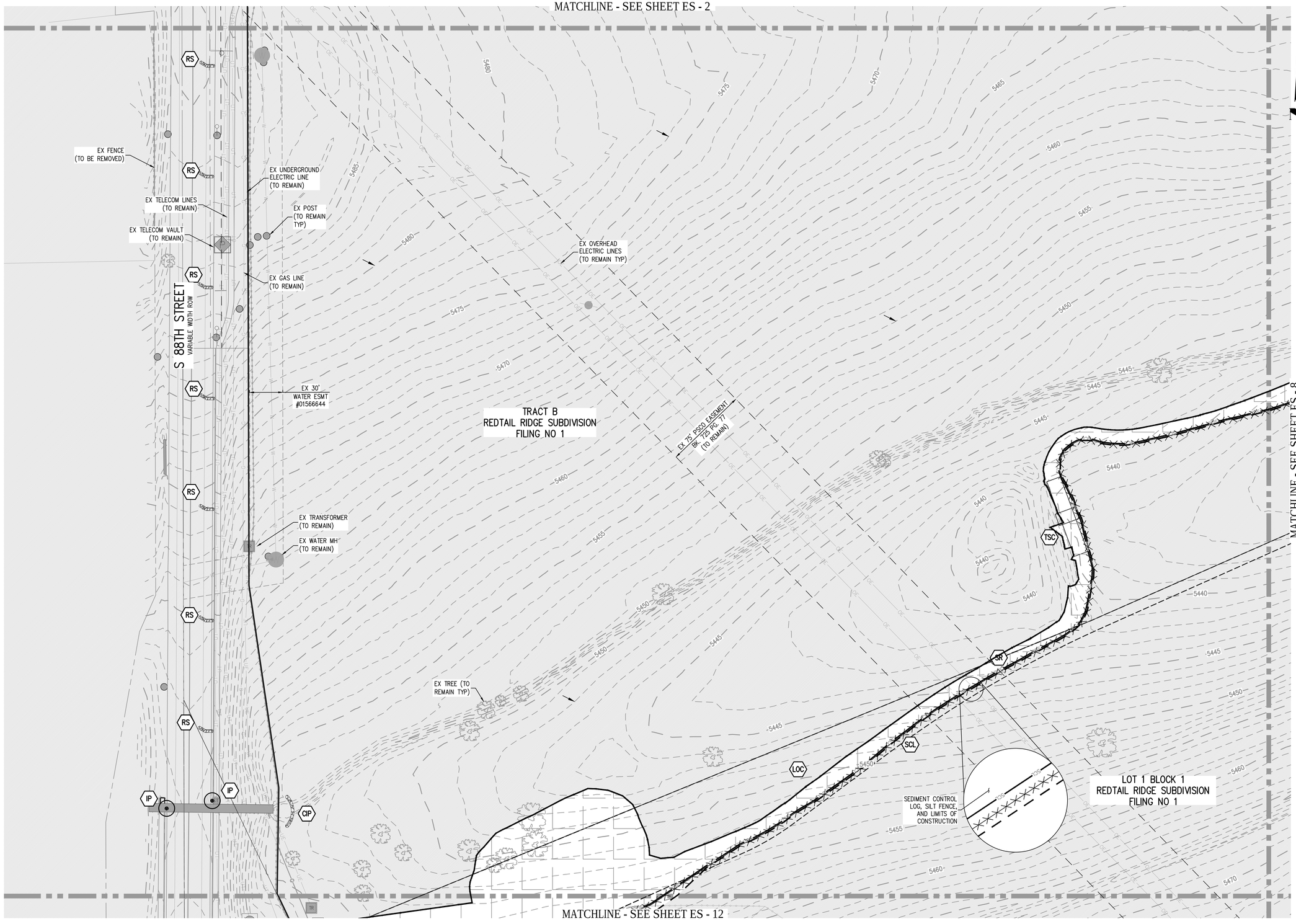
PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 6
ES - 6 OF ES - 91

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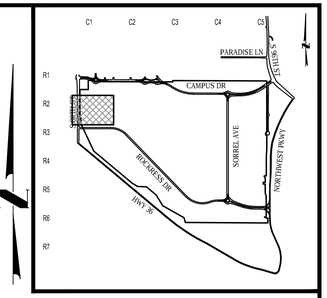
NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 2



MATCHLINE - SEE SHEET ES - 8

MATCHLINE - SEE SHEET ES - 12



KEY MAP
1"=2000'

NOTES:

1. ALL EXISTING SURFACE FEATURES NOT INCLUDED WITHIN FILING NO. 1 ARE TO REMAIN UNLESS OTHERWISE NOTED. SEE SHEETS MASTER UTILITY AND SURFACE IMPROVEMENTS PLAN FOR PHASING.
2. EXISTING SURFACE FEATURES ARE TO BE REMOVED AS NEEDED TO ACCOMMODATE THE PROPOSED DRAINAGE SWALES.
3. ALL EXISTING SURFACE FEATURES EXISTING UTILITIES IN THE UNDISTURBED AREA ARE TO REMAIN UNLESS OTHERWISE NOTED.

LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS
- EXISTING WATER LINE
- EXISTING STORM MAIN
- EXISTING SANITARY SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING OVERHEAD ELECTRIC
- EXISTING UNDERGROUND TELECOM
- CD — CHECK DAM
- CF — CONSTRUCTION FENCE
- CFD — COFFERDAM
- CVP — CULVERT PROTECTION
- CT — CONSTRUCTION TRAILER
- CWA — CONCRETE WASHOUT AREA
- IP — INLET PROTECTION
- LOC — LIMITS OF CONSTRUCTION
- OP — OUTLET PROTECTION
- RCS — ROUGH CUT STREET CONTROL
- RS — ROCK SOCK
- SCL — SEDIMENT CONTROL LOG
- SF — SILT FENCE
- SM — SEEDING AND MULCHING
- SP — SOIL STOCKPILE
- SR — SURFACE ROUGHENING
- SSA — STABILIZED STAGING AREA
- VTC — VEHICLE TRACKING CONTROL
- TSC — TEMPORARY STREAM CROSSING
- EXISTING STORM SEWER
- UNDISTURBED AREA
- RUNOFF ARROWS

811 Know what's below. Call before you dig.
CALL 3 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

HARRIS KOCHER SMITH
1120 Lincoln Street, Suite 1000
Denver, Colorado 80203
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HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INITIAL - R2 C1

ISSUE DATE: 11-15-2019	PROJECT #: 190108
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 7
ES - 7 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP_INITIAL - 1.DWG LAYOUT: NAVATINY - R2 C1
10 XREFs: client logo, e-base, e-legal, e-util, key map, pBase-1, pBase-2[1], p-legal-1, p-legal-2, stamp - swmp
PLOTTED: TIR| 04/01/21 10:41:36A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 3

MATCHLINE - SEE SHEET #####

MATCHLINE - SEE SHEET ES - 9

TRACT B
REDTAIL RIDGE SUBDIVISION
FILING NO 1

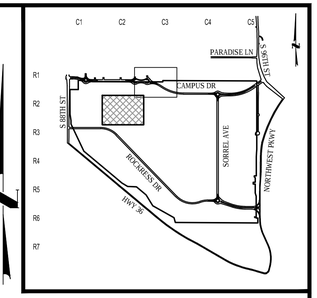
EX BRUSH (TO BE REMOVED TYP)

EX TREE (TO REMAIN TYP)

SEDIMENT CONTROL LOG, SILT FENCE, AND LIMITS OF CONSTRUCTION

LOT 1 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

MATCHLINE - SEE SHEET ES - 13



KEY MAP
1"=2000'

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LEGEND:

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- EXISTING CONTOURS
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40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

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BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INITIAL - R2 C2

ISSUE DATE: 11-15-2019 | PROJECT #: 190108

DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 8
ES - 8 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - INITIAL - 1.DWG, LAYOUT: NAVATNY R2 C2
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PLOTTED: THU 04/01/21 10:41:51A BY: TIM SAVLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 4

MATCHLINE - SEE SHEET ES - 8

MATCHLINE - SEE SHEET ES - 10

MATCHLINE - SEE SHEET ES - 14

EX DIRT TRAIL (TO BE REMOVED WITHIN LIMITS OF GRADING AND ABANDONED OTHERWISE)

EX FENCE (TO REMAIN)

EX DIRT TRAIL (TO BE REMOVED WITHIN LIMITS OF GRADING AND ABANDONED OTHERWISE)

EX POST (TO REMAIN TYP)

EX UNDERGROUND TELECOMM (TO REMAIN TYP)

EX SECTION LINE

EX FENCE (TO BE REMOVED)

EX TREE (TO BE REMOVED TYP)

16' DRAINAGE SWALE

PR LOT LINE (TYP)

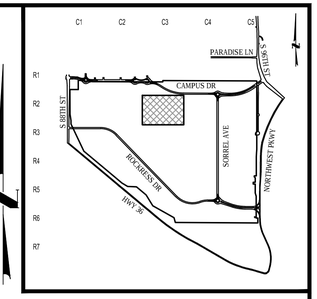
LOT 1 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

LOT 1 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

5415 5420 5425 5430 5435 5410

SR

MH



KEY MAP
1"=2000'

NOTES:

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LEGEND:

- RIGHT-OF-WAY
- 5264 / 5265 EXISTING CONTOURS
- W EXISTING WATER LINE
- ST EXISTING STORM MAIN
- SS EXISTING SANITARY SEWER
- UE EXISTING UNDERGROUND ELECTRIC
- OE EXISTING OVERHEAD ELECTRIC
- UT EXISTING UNDERGROUND TELECOM
- CD CHECK DAM
- CF CONSTRUCTION FENCE
- CFD COFFERDAM
- CP CULVERT PROTECTION
- CT CONSTRUCTION TRAILER
- CWW CONCRETE WASHOUT AREA
- IP INLET PROTECTION
- LOC LIMITS OF CONSTRUCTION
- OP OUTLET PROTECTION
- RCS ROUGH CUT STREET CONTROL
- RS ROCK SOCK
- SCL SCL SEDIMENT CONTROL LOG
- SF SILT FENCE
- SM SEEDING AND MULCHING
- SP SOIL STOCKPILE
- SR SURFACE ROUGHENGING
- SSA STABILIZED STAGING AREA
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- UNDISTURBED AREA
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40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

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HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INITIAL - R2 C3

ISSUE DATE: 11-15-2019	PROJECT #: 190108
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 9
ES - 9 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - INITIAL - 2.DWG LAYOUT: NAVATNY - R2 C3
11 XREFS: client logo, e-base, e-legal, e-util, [d1], key map, p-base-t, p-base-t2[1], p-legal-f1[1], p-legal-t2[1], stamp - swmp
PLOTTED: THU 04/01/21 10:42:18A BY: TIM SAVER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 5

MATCHLINE - SEE SHEET ES - 9

MATCHLINE - SEE SHEET ES - 11

MATCHLINE - SEE SHEET ES - 15

LOT 1 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

EX SECTION LINE

SORREL AVE (79' ROW)

PR 24' HAUL ROUTE

PR ROW (TYP)

5410 5405 5400 5395 5390 5385 5380

SF SR SB LOC



KEY MAP
1"=2000'

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LEGEND:

- RIGHT-OF-WAY
- 5264 / 5265 — EXISTING CONTOURS
- W — EXISTING WATER LINE
- ST — EXISTING STORM MAIN
- SS — EXISTING SANITARY SEWER
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40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

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HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INITIAL - R2 C4

ISSUE DATE: 11-15-2019	PROJECT #: 190108
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 10
ES - 10 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - INITIAL - 2.DWG LAYOUT: NAVATNY - R2 C4
11 XREFS: client logo, e-base, e-logo, e-soil, (@1), key map, p-base-r4, p-base-r2[1], p-base-r1[1], p-legal-2[1], p-legal-1[1], stamp - swmp
PLOTTED: THU 04/01/21 10:42:38A BY: TIM SAVER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 6

MATCHLINE - SEE SHEET ES - 10

MATCHLINE - SEE SHEET ES - 16

EX DIRT TRAIL (TO BE REMOVED WITHIN LIMITS OF GRADING AND ABANDONED OTHERWISE)

EX DIRT TRAIL (TO BE REMOVED WITHIN LIMITS OF GRADING AND ABANDONED OTHERWISE)

EX FENCE (TO BE REMOVED WITHIN LIMITS OF GRADING AND ABANDONED OTHERWISE)

EX CONC PAD (TO BE REMOVED)

TRACT D
REDTAIL RIDGE
SUBDIVISION
FILING NO 1

EX ASPHALT PAVEMENT (TO REMAIN)

EX FENCE (TO BE REMOVED WITHIN LIMITS OF GRADING AND ABANDONED OTHERWISE)

SOIL STORAGE AREA 30'X100'

EX BUILDING (TO REMAIN)

TRAILER BATHROOM

EX BRUSH (TO BE REMOVED TYP)

PR ROW (TYP)

EX FENCE (TO BE REMOVED WITHIN LIMITS OF GRADING AND ABANDONED OTHERWISE)

EX FENCE (TO BE REMOVED)

EX FENCE (TO BE REMOVED WITHIN LIMITS OF GRADING AND ABANDONED OTHERWISE)

EX ASPHALT PAVEMENT (TO BE REMOVED WITHIN LIMITS OF GRADING AND ABANDONED OTHERWISE)

LOT 1 BLOCK 2
REDTAIL RIDGE SUBDIVISION
FILING NO 1

EX FENCE (TO BE REMOVED WITHIN LIMITS OF GRADING AND ABANDONED OTHERWISE)

EX UNDERGROUND TELECOMS (TO REMAIN)

EX FENCE (TO BE REMOVED)

EX DIRT TRAIL (TO BE REMOVED WITHIN LIMITS OF GRADING AND ABANDONED OTHERWISE)

EX STORM CULVERT (TO BE REMOVED)

EX TREES (TO BE REMOVED TYP)

EX GATE (TO BE REMOVED)

EX WATER LINE (TO REMAIN)

LIMITS OF CONSTRUCTION AND SILT FENCE (TYP)

EX WATER LINE (TO BE ABANDONED)

EX FENCE (TO BE REMOVED)

EX POWER POLE (TO REMAIN TYP)

EX GAS LINE (TO REMAIN)

PR PROPERTY BOUNDARY (TYP)

EX TELECOM RISER (TO REMAIN)

EX ROW (TYP)

EX STORM CULVERT (TO REMAIN)

TRACT E
REDTAIL RDIGE
SUBDIVISION
FILING NO 1

S 96TH STREET
60' ROW

EX STORM CULVERT (TO REMAIN)

EX GATE (TO REMAIN)

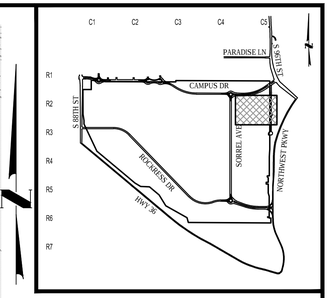
EX 60' ROW

EX UNDERGROUND ELECTRIC (TO REMAIN)

EX TELECOM RISER (TO REMAIN)

KEY MAP

1"=2000'



NOTES:

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- RIGHT-OF-WAY
- EXISTING CONTOURS (5264 / 5265)
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40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

HARRIS KOCHER SMITH
1120 Lincoln Street, Suite 1000
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HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INITIAL - R2 C5
NORTHEAST B

ISSUE DATE: 11-15-2019 | PROJECT #: 190108

DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

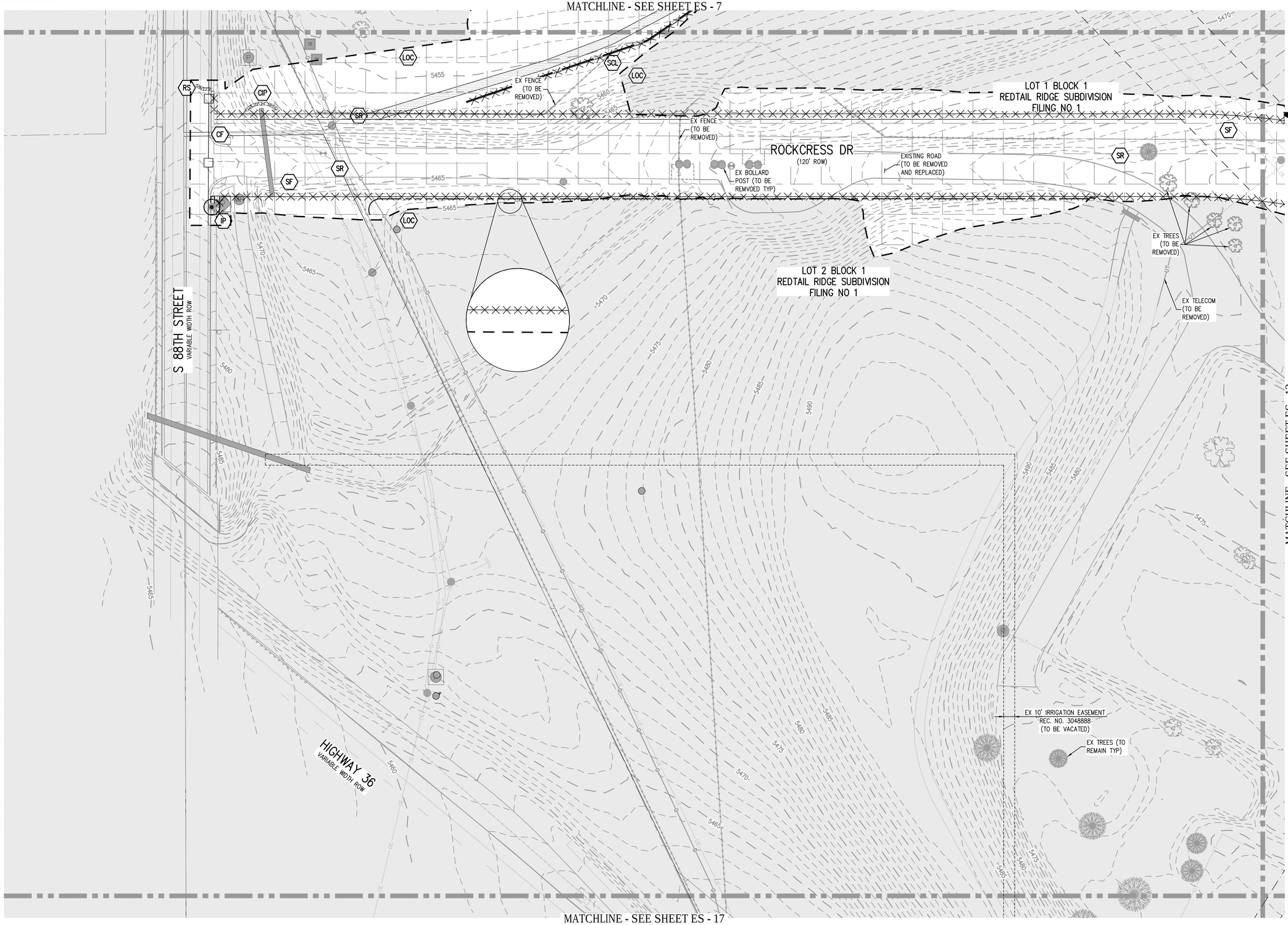
PRELIMINARY NOT FOR CONSTRUCTION

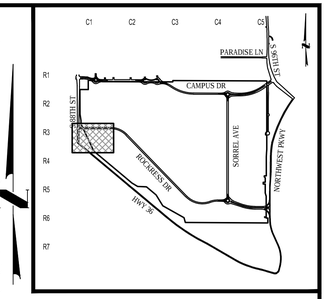
SHEET NO.
ES - 11
ES - 11 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - INITIAL - 2 DWG\ LAYOUT: NAVATNY - R2 C5
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PLOTTED: TBI 04/01/21 10:42:53A BY: TIM SAVER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 7





KEY MAP
1"=2000'

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MATCHLINE - SEE SHEET ES - 13

MATCHLINE - SEE SHEET ES - 17

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40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

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BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INITIAL - R3 C1

ISSUE DATE: 11-15-2019 | PROJECT #: 190108

DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 12
ES - 12 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - INITIAL - 2.DWG LAYOUT: NAVATNY - R3 C1
11 XREFS: client logo, e-base, e-legal, e-util, ltd(), key map, p-base-f(2[1]), p-legal-f1[1], p-legal-f2[1], stamp - swmp
PLOTTED: THU 04/01/21 10:43:12A BY: TIM SAVER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH.

MATCHLINE - SEE SHEET ES - 8

MATCHLINE - SEE SHEET ES - 12

MATCHLINE - SEE SHEET ES - 14

MATCHLINE - SEE SHEET ES - 18

LOT 1 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

LOT 2 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

EX SECTION LINE

EX TREES (TO BE REMOVED TYP)

EX ROAD (TO BE REMOVED AND REPLACE)

EX 75' PSCO EASEMENT BK. 725 PG. 77 (TO REMAIN)

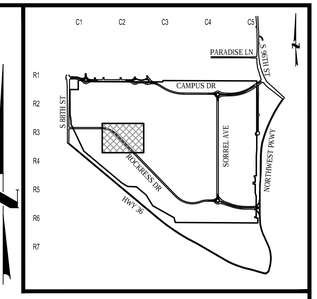
ROCKCRESS DR (120' ROW)

EX BOLLARD POSTS (TO BE REMOVED TYP)

EX TREE (TO BE REMOVED TYP)

EX TREES (TO REMAIN TYP)

EX 20' PSCO EASEMENT REC. NO. 0100508? (TO BE VACATED)



KEY MAP
1"=2000'

NOTES:

1. ALL EXISTING SURFACE FEATURES NOT INCLUDED WITHIN FILING NO. 1 ARE TO REMAIN UNLESS OTHERWISE NOTED. SEE SHEETS MASTER UTILITY AND SURFACE IMPROVEMENTS PLAN FOR PHASING.
2. EXISTING SURFACE FEATURES ARE TO BE REMOVED AS NEEDED TO ACCOMMODATE THE PROPOSED DRAINAGE SWALES.
3. ALL EXISTING SURFACE FEATURES EXISTING UTILITIES IN THE UNDISTURBED AREA ARE TO REMAIN UNLESS OTHERWISE NOTED.

LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS
- EXISTING WATER LINE
- EXISTING STORM MAIN
- EXISTING SANITARY SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING OVERHEAD ELECTRIC
- EXISTING UNDERGROUND TELECOM
- CHECK DAM
- CONSTRUCTION FENCE
- COFFERDAM
- CULVERT PROTECTION
- CONSTRUCTION TRAILER
- CONCRETE WASHOUT AREA
- INLET PROTECTION
- LIMITS OF CONSTRUCTION
- OUTLET PROTECTION
- ROUGH CUT STREET CONTROL
- ROCK SOCK
- SEDIMENT CONTROL LOG
- SILT FENCE
- SEEDING AND MULCHING
- SOIL STOCKPILE
- SURFACE ROUGHENING
- STABILIZED STAGING AREA
- VEHICLE TRACKING CONTROL
- TEMPORARY STREAM CROSSING
- EXISTING STORM SEWER
- UNDISTURBED AREA
- RUNOFF ARROWS

811 Know what's below. Call before you dig.
CALL 3 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

HARRIS KOCHER SMITH
1120 Lincoln Street, Suite 1000
Denver, Colorado 80203
P: 303.623.6300 F: 303.623.6311
HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INITIAL - R3 C2

ISSUE DATE: 11-15-2019	PROJECT #: 190108
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 13
ES - 13 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP_INITIAL_2.DWG LAYOUT: NAV4TNY_R3 C2
11 XREFs: client logo, e-base, e-legal, e-tnl, h[U], key map, p-base-f1, p-base-f2[U], p-legal-f1[U], p-legal-f2[U], stamp - swmp
PLOTTED: TIR(04/01/21 10:43:27A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 9

MATCHLINE - SEE SHEET ES - 13

MATCHLINE - SEE SHEET ES - 15

MATCHLINE - SEE SHEET ES - 19

EX SECTION LINE

EX FENCE (TO BE REMOVED)

EX SECTION LINE

EX TELECOM (TO BE REMOVED)

EX SECTION LINE

EX BOLLARD POST (TO BE REMOVED TYP)

EX FH (TO BE REMOVED)

EX ASPHALT (TO BE REMOVED)

PR LOT LINE (TYP)

EX FENCE (TO BE REMOVED)

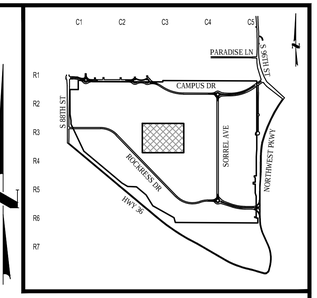
LOT 1 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 2

LOT 1 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

EX CONC PAD (TO BE REMOVED)

EX TREE (TO BE REMOVED TYP)

EX TREES (TO REMAIN TYP)



KEY MAP
1"=2000'

NOTES:

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LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS
- EXISTING WATER LINE
- EXISTING STORM MAIN
- EXISTING SANITARY SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING OVERHEAD ELECTRIC
- EXISTING UNDERGROUND TELECOM
- CHECK DAM
- CONSTRUCTION FENCE
- COFFERDAM
- CULVERT PROTECTION
- CONSTRUCTION TRAILER
- CONCRETE WASHOUT AREA
- INLET PROTECTION
- LIMITS OF CONSTRUCTION
- OUTLET PROTECTION
- ROUGH CUT STREET CONTROL
- ROCK SOCK
- SEDIMENT CONTROL LOG
- SILT FENCE
- SEEDING AND MULCHING
- SOIL STOCKPILE
- SURFACE ROUGHENING
- STABILIZED STAGING AREA
- VEHICLE TRACKING CONTROL
- TEMPORARY STREAM CROSSING
- EXISTING STORM SEWER
- UNDISTURBED AREA
- RUNOFF ARROWS

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40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

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BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INITIAL - R3 C3

ISSUE DATE: 11-15-2019	PROJECT #: 190108
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 14
ES - 14 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - INITIAL - 2.DWG LAYOUT: NAV43TN' - R3 C3
11 XREFS: client logo, e-base, e-legal, e-soil, ig[1], key map, p-base-t, p-base-t2[1], p-legal-1[1], p-legal-2[1], stamp - swmp
PLOTTED: TH| 04/01/21 10:43:42A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 10

MATCHLINE - SEE SHEET ES - 14

MATCHLINE - SEE SHEET ES - 16

MATCHLINE - SEE SHEET ES - 20

EX SECTION LINE

EX ROADWAY (TO BE REMOVED)

EX HEADWALL (TO BE REMOVED)

EX UNDERGROUND TELECOM (TO BE REMOVED WITHIN LIMITS OF GRADING AND ABANDONED OTHERWISE)

EX CONC PAVEMENT (TO BE REMOVED)

EX POST (TO BE REMOVED)

EX UNDERGROUND TELECOM (TO BE ABANDAONED)

EX FIRE HYDRANT (TO BE ABANDONED)

EX SECTION LINE

EX TREE (TO REMAIN TYP)

LOT 1 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

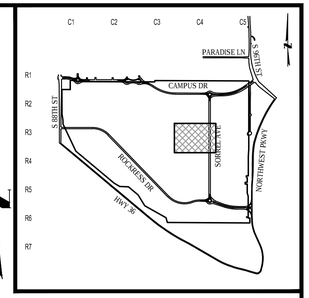
SORREL AVE
(79' ROW)

PR ROW (TYP)

PR 24' HAUL ROUTE

EX FIRE HYDRANT (TO BE REMOVED)

EX CONC PAVEMENT & MANHOLE (TO BE REMOVED)



KEY MAP
1"=2000'

NOTES:

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LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS
- EXISTING WATER LINE
- EXISTING STORM MAIN
- EXISTING SANITARY SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING OVERHEAD ELECTRIC
- EXISTING UNDERGROUND TELECOM
- CHECK DAM
- CONSTRUCTION FENCE
- COFFERDAM
- CULVERT PROTECTION
- CONSTRUCTION TRAILER
- CONCRETE WASHOUT AREA
- INLET PROTECTION
- LIMITS OF CONSTRUCTION
- OUTLET PROTECTION
- ROUGH CUT STREET CONTROL
- ROCK SOCK
- SEDIMENT CONTROL LOG
- SILT FENCE
- SEEDING AND MULCHING
- SOIL STOCKPILE
- SURFACE ROUGHENGING
- STABILIZED STAGING AREA
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- TEMPORARY STREAM CROSSING
- EXISTING STORM SEWER
- UNDISTURBED AREA
- RUNOFF ARROWS

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40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

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Denver, Colorado 80203
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HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INITIAL - R3 C4

ISSUE DATE: 11-15-2019 | PROJECT #: 190108

DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 15
ES - 15 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - INITIAL - 2.DWG LAYOUT: NAVATAV - R3 C4
11 XREFs: c:\dwt logo, e-base, e-legal, e-util, [d,U], key map, p-base-1, p-base-2 [U], p-legal-1 [U], p-legal-2 [U], p-legal-3 [U], stamp - swmp
PLOTTED: THU 04/01/21 10:43:58A BY: TIM SAYLER

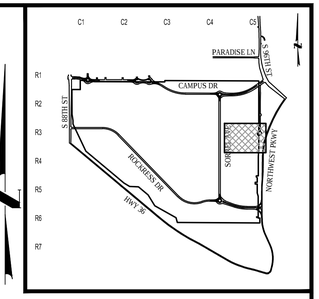
NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 11

MATCHLINE - SEE SHEET ES - 15

MATCHLINE - SEE SHEET ES - 21

EX GAS METER (TO BE REMOVED)
EX FIRE HYDRANT (TO REMAIN)
EX WATER LINE (TO REMAIN)
EX WATER VALVE (TO REMAIN)
EX LIGHT POLE (TO REMAIN)
EX GAS LINE (TO BE REMOVED TYP)
EX TELECOM RISER (TO REMAIN)
S 96TH STREET
60' ROW
EX ROW (TYP)
EX FENCE (TO REMAIN TYP)
EX TELECOM VAULT (TO REMAIN)
EX UNDERGROUND TELECOM (TO BE REMAIN)
EX UNDERGROUND ELECTRIC (TO REMAIN)
EX POWER POLE (TO REMAIN TYP)
EX OVERHEAD ELECTRIC (TO REMAIN)
EX POST (TO REMAIN)
EX ELECTRIC VAULT (TO REMAIN)
EX WATER MANHOLE (TO REMAIN)
EX STORM MANHOLE (TO REMAIN)
EX STORM CULVERT (TO REMAIN)
EX FENCE (TO REMAIN)
EX POLICE COMMUNICATIONS TOWER (TO REMAIN)
EX ASPHALT (TO REMAIN TYP)
EX STREET LIGHT (TO BE REMOVED)
EX UNDERGROUND ELECTRIC (TO BE REMOVED TYP)
EX POST (TO REMAIN TYP)
EX UNDERGROUND ELECTRIC (TO REMAIN)
EX STORM CULVERT (TO BE REMOVED)
EX BUILDING (TO BE REMOVED)
EX GAS LINE (TO REMAIN)
EX FENCE (TO BE REMOVED TYP)
EX CONC PAVEMENT (TO BE REMOVED TYP)
EX GAS METER (TO REMAIN)
EX TELECOM RISER (TO REMAIN)
LOT 1 BLOCK 2
REDTAIL RIDGE SUBDIVISION
FILING NO 1
EX TREE (TO REMAIN TYP)
EX MH (TO REMAIN TYP)
EX RIP RAP (TO REMAIN)
EX FENCE (TO REMAIN)
EX UNDERGROUND ELECTRIC (TO REMAIN)
EX GAS LINE (TO REMAIN)
EX UNDERGROUND TELECOM (TO REMAIN)
TRACT E
REDTAIL RDIGE
SUBDIVISION
FILING NO 1
LIMITS OF CONSTRUCTION / SILT FENCE (TYP)
EX ASPHALT PAVEMENT (TO BE REMOVED TYP)
EX TREE (TO BE REMOVED TYP)
PROPERTY BOUNDARY (TYP)
NORTHWEST PKWY
VARIABLE WIDTH ROW



KEY MAP
1"=2000'

NOTES:

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LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS
- EXISTING WATER LINE
- EXISTING STORM MAIN
- EXISTING SANITARY SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING OVERHEAD ELECTRIC
- EXISTING UNDERGROUND TELECOM
- CHECK DAM
- CONSTRUCTION FENCE
- COFFERDAM
- CULVERT PROTECTION
- CONSTRUCTION TRAILER
- CONCRETE WASHOUT AREA
- INLET PROTECTION
- LIMITS OF CONSTRUCTION
- OUTLET PROTECTION
- ROUGH CUT STREET CONTROL
- ROCK SOCK
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- TEMPORARY STREAM CROSSING
- EXISTING STORM SEWER
- UNDISTURBED AREA
- RUNOFF ARROWS

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40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

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Denver, Colorado 80203
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HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INITIAL - R3 C5

ISSUE DATE: 11-15-2019	PROJECT #: 190108
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

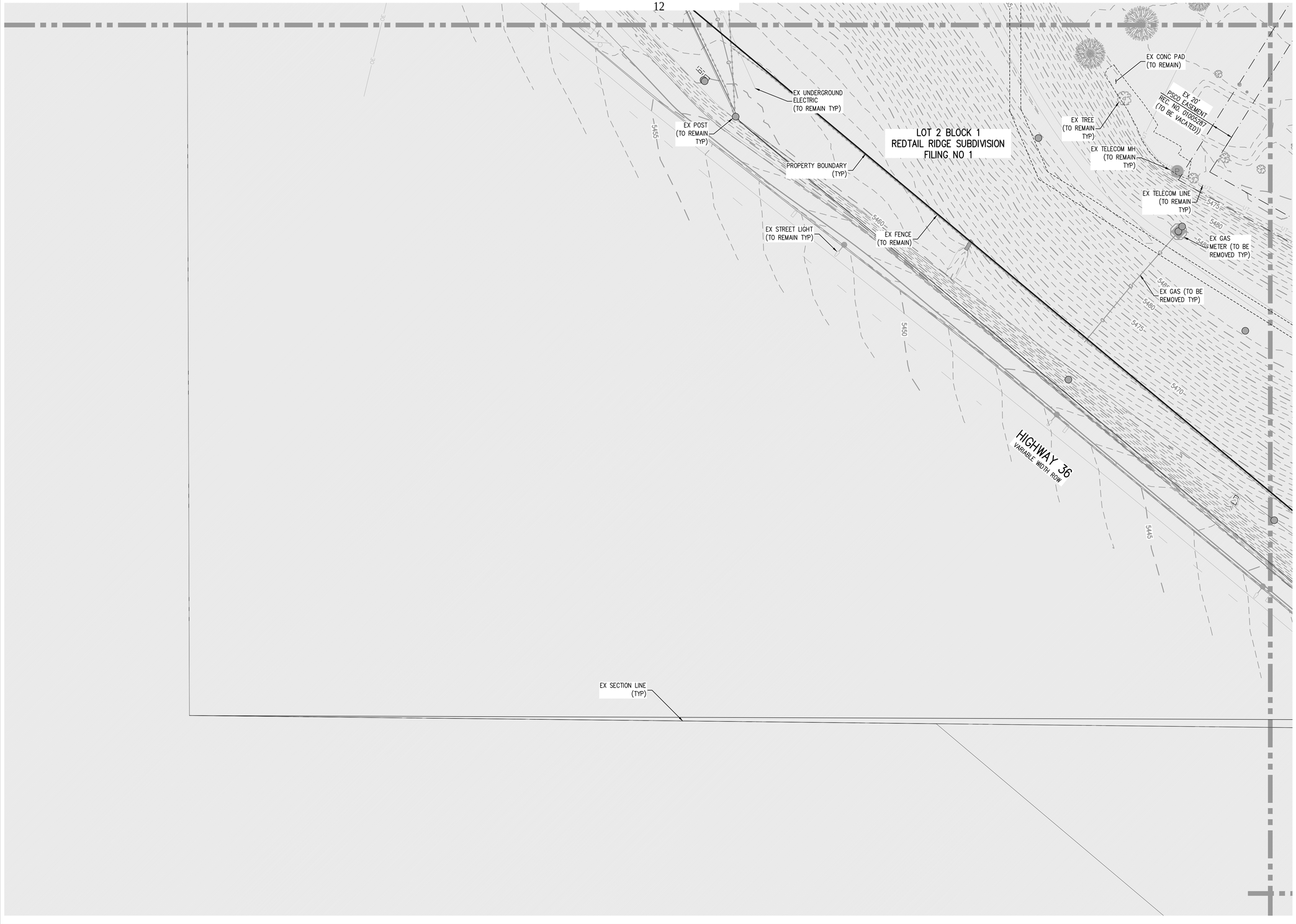
PRELIMINARY NOT FOR CONSTRUCTION

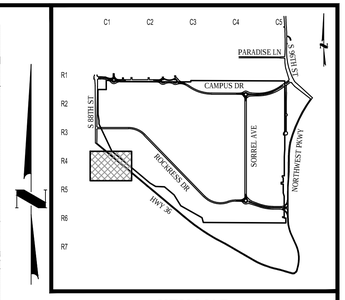
SHEET NO.
ES - 16
ES - 16 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - INITIAL - 3.DWG LAYOUT: NAVASTNY - R3 C5
11 XREF's: client logo, e-base, e-legal, e-cell, lg - swmp-Eling [1].l, key map, p-base-f1, p-base-f2, p-legal-f1, p-legal-f2, stamp - swmp
PLOTTED: TH[04/01/21 10:44:28A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 12





KEY MAP
1"=2000'

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LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS (5264 / 5265)
- EXISTING WATER LINE (W)
- EXISTING STORM MAIN (ST)
- EXISTING SANITARY SEWER (SS)
- EXISTING UNDERGROUND ELECTRIC (UE)
- EXISTING OVERHEAD ELECTRIC (OE)
- EXISTING UNDERGROUND TELECOM (UT)
- CHECK DAM (CD)
- CONSTRUCTION FENCE (CF)
- COFFERDAM (CFD)
- CULVERT PROTECTION (CP)
- CONSTRUCTION TRAILER (CT)
- CONCRETE WASHOUT AREA (CWA)
- INLET PROTECTION (IP)
- LIMITS OF CONSTRUCTION (LOC)
- OUTLET PROTECTION (OP)
- ROUGH CUT STREET CONTROL (RCS)
- ROCK SOCK (RS)
- SEDIMENT CONTROL LOG (SCL)
- SILT FENCE (SF)
- SEEDING AND MULCHING (SM)
- SOIL STOCKPILE (SP)
- SURFACE ROUGHENGING (SR)
- STABILIZED STAGING AREA (SSA)
- VEHICLE TRACKING CONTROL (VTC)
- TEMPORARY STREAM CROSSING (TSC)
- EXISTING STORM SEWER
- UNDISTURBED AREA
- RUNOFF ARROWS

MATCHLINE - SEE SHEET ES - 18

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40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

HARRIS KOCHER SMITH
1120 Lincoln Street, Suite 1000
Denver, Colorado 80203
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HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INITIAL - R4 C1

ISSUE DATE: 11-15-2019	PROJECT #: 190108
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 17
ES - 17 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP_INITIAL_2.DWG LAYOUT: NAWATNY - R4 C1
11 XREFs: c-lien logo, c-base, c-legal, c-util_lg, c-swmp-filing 1[1], key map, p-base-f1, p-base-f2, p-legal-f1, p-legal-f2, ssamp - swmp
PLOTTED: THU 04/01/21 10:44:47A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 13

MATCHLINE - SEE SHEET ES - 17

MATCHLINE - SEE SHEET ES - 19

MATCHLINE - SEE SHEET ES - 22

LOT 2 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

EX TREE (TO REMAIN TYP)

EX POST (TO REMAIN TYP)

EX SECTION LINE

EX OVERHEAD ELECTRIC (TO REMAIN)

EX MH (TO BE REMOVED)

EX TELECOM (TO BE REMOVED WITHIN LIMITS OF GRADING AND ABANDONED OTHERWISE)

EX TREE (TO BE REMOVED TYP)

EX CHANNEL (TO BE REMOVED WITHIN LIMITS OF GRADING AND ABANDONED OTHERWISE)

EX 75' PSCO EASEMENT BK 725 PG 77 (TO REMAIN)

EX ROAD (TO BE REMOVED WITHIN LIMITS OF GRADING AND ABANDONED OTHERWISE)

EX ASPHALT (TO REMAIN TYP)

EX 20' PSCSD EASEMENT REC. NO. 01005387 (TO BE VACATED)

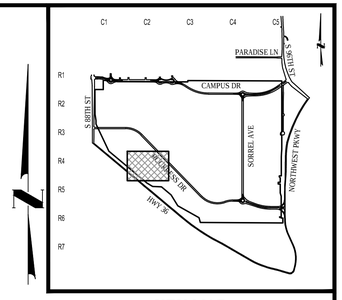
EX 10' IRRIGATION EASEMENT REC. NO. 5048888 (TO BE VACATED)

SILT FENCE AND LIMITS OF CONSTRUCTION (TYP)

PROPERTY BOUNDARY (TYP)

HIGHWAY 36
VARIABLE WIDTH ROW

EX SECTION LINE



KEY MAP
1"=2000'

NOTES:

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LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS
- EXISTING WATER LINE
- EXISTING STORM MAIN
- EXISTING SANITARY SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING OVERHEAD ELECTRIC
- EXISTING UNDERGROUND TELECOM
- CHECK DAM
- CONSTRUCTION FENCE
- COFFERDAM
- CULVERT PROTECTION
- CONSTRUCTION TRAILER
- CONCRETE WASHOUT AREA
- INLET PROTECTION
- LIMITS OF CONSTRUCTION
- OUTLET PROTECTION
- ROUGH CUT STREET CONTROL
- ROCK SOCK
- SEDIMENT CONTROL LOG
- SILT FENCE
- SEEDING AND MULCHING
- SOIL STOCKPILE
- SURFACE ROUGHENGING
- STABILIZED STAGING AREA
- VEHICLE TRACKING CONTROL
- TEMPORARY STREAM CROSSING
- EXISTING STORM SEWER
- UNDISTURBED AREA
- RUNOFF ARROWS

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40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

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BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INITIAL - R4 C2

ISSUE DATE: 11-15-2019 | PROJECT #: 190108

DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

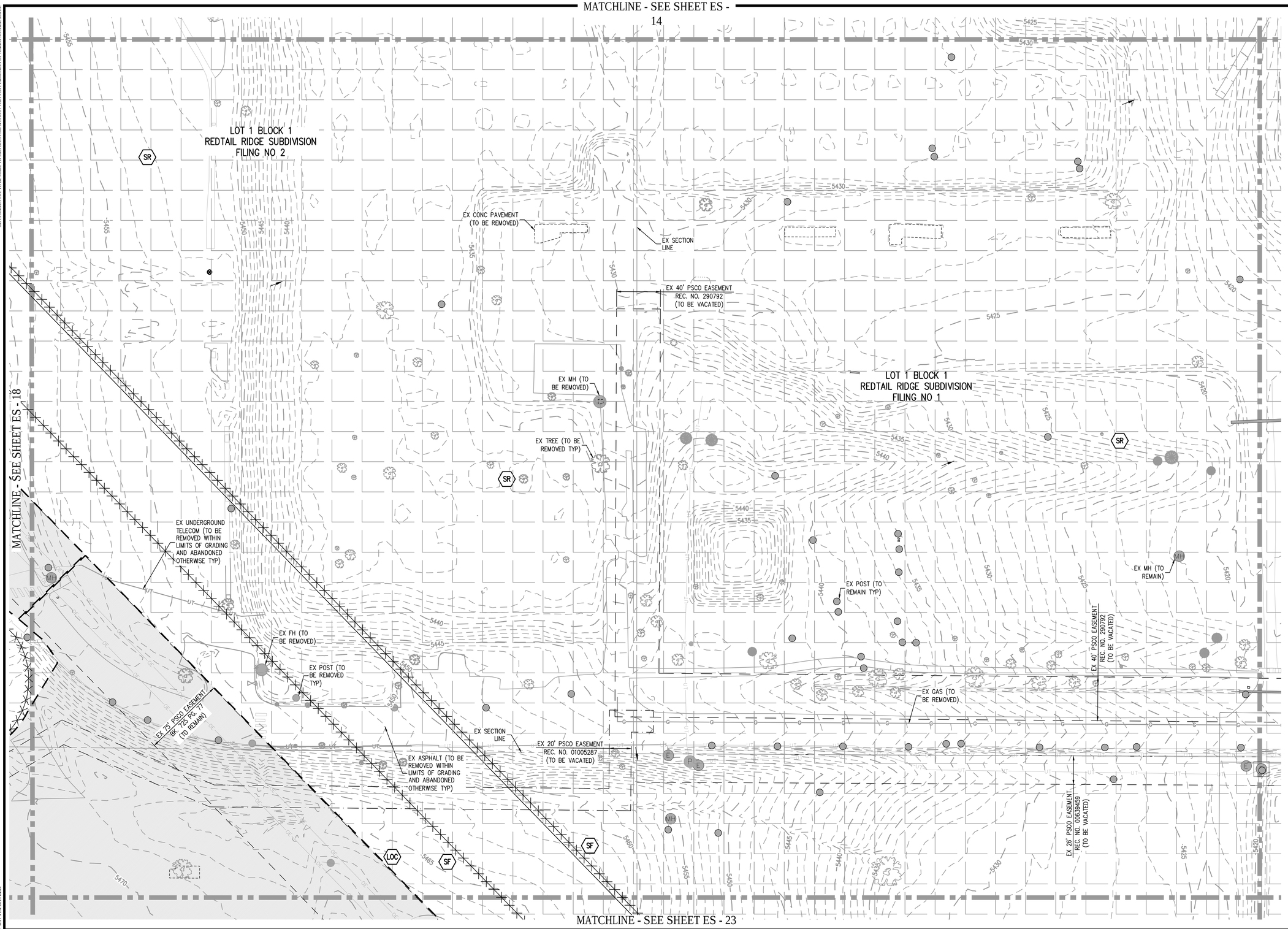
PRELIMINARY NOT FOR CONSTRUCTION

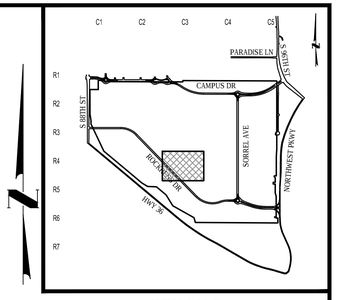
SHEET NO.
ES - 18
ES - 18 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP_INITIAL_2.DWG LAYOUT: MAWATNY_R4 C2
11 XREFs: client logo, e-base, e-legal, e-util, lg - swmp-fling [U], key map, p-base-f1, p-base-f2, p-legal-f1, p-legal-f2, stamp - swmp
PLOTTED: TIR(04/01/21 10:45:02A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 14





KEY MAP
1"=2000'

NOTES:

1. ALL EXISTING SURFACE FEATURES NOT INCLUDED WITHIN FILING NO. 1 ARE TO REMAIN UNLESS OTHERWISE NOTED. SEE SHEETS MASTER UTILITY AND SURFACE IMPROVEMENTS PLAN FOR PHASING.
2. EXISTING SURFACE FEATURES ARE TO BE REMOVED AS NEEDED TO ACCOMMODATE THE PROPOSED DRAINAGE SWALES.
3. ALL EXISTING SURFACE FEATURES EXISTING UTILITIES IN THE UNDISTURBED AREA ARE TO REMAIN UNLESS OTHERWISE NOTED.

LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS
- EXISTING WATER LINE
- EXISTING STORM MAIN
- EXISTING SANITARY SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING OVERHEAD ELECTRIC
- EXISTING UNDERGROUND TELECOM
- CHECK DAM
- CONSTRUCTION FENCE
- COFFERDAM
- CULVERT PROTECTION
- CONSTRUCTION TRAILER
- CONCRETE WASHOUT AREA
- INLET PROTECTION
- LIMITS OF CONSTRUCTION
- OUTLET PROTECTION
- ROUGH CUT STREET CONTROL
- ROCK SOCK
- SEDIMENT CONTROL LOG
- SILT FENCE
- SEEDING AND MULCHING
- SOIL STOCKPILE
- SURFACE ROUGHENING
- STABILIZED STAGING AREA
- VEHICLE TRACKING CONTROL
- TEMPORARY STREAM CROSSING
- EXISTING STORM SEWER
- UNDISTURBED AREA
- RUNOFF ARROWS

811 Know what's below. Call before you dig.

CALL 3 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

HARRIS KOCHER SMITH
1120 Lincoln Street, Suite 1000
Denver, Colorado 80203
P: 303.623.6300 F: 303.623.6311
HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INITIAL - R4 C3

ISSUE DATE: 11-15-2019	PROJECT #: 190108
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 19
ES - 19 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - INITIAL - 3.DWG LAYOUT: NAVASTNY - R4 C3
11 XREFs: client logo, e-base, e-legal, e-util, lg - swmp-fling [1]1, key map, p-base-01, p-base-02, p-legal-01, p-legal-02, stamp - swmp
PLOTTED: TIR| 04/01/21 10:45:17A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 15

MATCHLINE - SEE SHEET ES - 19

MATCHLINE - SEE SHEET ES - 21

MATCHLINE - SEE SHEET ES - 24

LOT 1 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

SORREL AVE
(79' ROW)

EX TREE (TO REMAIN TYP)

EX TREE (TO BE REMOVED TYP)

PR ROW (TYP)

EX BUSH (TO BE REMOVED TYP)

EX BRUSH (TO BE REMOVED TYP)

EX ASPHALT (TO REMAIN TYP)

EX SECTION LINE

PR 24' HAUL ROUTE

EX ASPHALT PAVEMENT (TO BE REMOVED WITHIN LIMITS OF GRADING AND ABANDONED OTHERWISE TYP)

HP:5401.29

EX 40' PSCO EASEMENT REC. NO. 290792 (TO REMAIN)

EX 100' PSCO EASEMENT REC. NO. 0067053711 (TO BE VACATED)

EX UNDERGROUND TELECOM (TO REMAIN TYP)

EX FH (TO REMAIN TYP)

EX SECTION LINE

EX TELECOM RISER (TO REMAIN)

EX TRANSFORMER (TO REMAIN TYP)

EX GAS LINE (TO BE REMOVED)

EX POST (TO REMAIN TYP)

EX ROADWAY (TO BE REMOVED)

EX POST (TO BE REMOVED TYP)

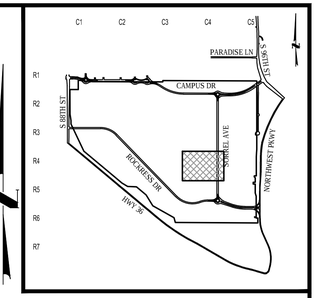
EX UNDERGROUN TELECOM (TO BE REMOVED WITHIN ROW)

EX 26' PSCO EASEMENT REC. NO. 006339459 (TO REMAIN)

EX 50' PSCO EASEMENT REC. NO. 543534 (TO REMAIN)

EX ELEC MH (TO REMAIN TYP)

EX 26' PSCO EASEMENT REC. NO. 531607 (TO REMAIN)



KEY MAP
1"=2000'

NOTES:

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LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS
- EXISTING WATER LINE
- EXISTING STORM MAIN
- EXISTING SANITARY SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING OVERHEAD ELECTRIC
- EXISTING UNDERGROUND TELECOM
- CD — CHECK DAM
- CF — CONSTRUCTION FENCE
- CFD — COFFERDAM
- CP — CULVERT PROTECTION
- CT — CONSTRUCTION TRAILER
- CWA — CONCRETE WASHOUT AREA
- IP — INLET PROTECTION
- LOC — LIMITS OF CONSTRUCTION
- OP — OUTLET PROTECTION
- RCS — ROUGH CUT STREET CONTROL
- RS — ROCK SOCK
- SCL — SEDIMENT CONTROL LOG
- SF — SILT FENCE
- SM — SEEDING AND MULCHING
- SP — SOIL STOCKPILE
- SR — SURFACE ROUGHENGING
- SSA — STABILIZED STAGING AREA
- VTC — VEHICLE TRACKING CONTROL
- TSC — TEMPORARY STREAM CROSSING
- EXISTING STORM SEWER
- UNDISTURBED AREA
- RUNOFF ARROWS

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40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

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HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INITIAL - R4 C4

ISSUE DATE: 11-15-2019	PROJECT #: 190108
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 20
ES - 20 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP_INITIAL_2.DWG LAYOUT: NAVATNY - R4 C4
11 XREFs: c:\em logo, e-base, e-legal, e-util, lg - swmp-filing IUL key map, p-base-f1, p-base-f2, p-legal-f1, p-legal-f2, stamp - swmp
PLOTTED: THU 04/01/21 10:45:32A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 16

MATCHLINE - SEE SHEET ES - 20

MATCHLINE - SEE SHEET ES - 25

TRACT E
REDTAIL RIDGE
SUBIVISION
FILING NO 1

LOT 1 BLOCK 2
REDTAIL RIDGE SUBDIVISION
FILING NO 1

EX TREE (TO REMAIN TYP)

EX MH (TO REMAIN TYP)

EX ASPHALT PAVEMENT (TO REMAIN)

PROPERTY BOUNDARY (TYP)

LIMITS OF CONSTRUCTION, CONSTRUCTION FENCE, SILT FENCE (TYP)

EX STORM INLET (TO REMAIN)

EX STM (TO REMAIN)

EX 25' PSCO EASEMENT REC. NO. 01000400 (TO REMAIN)

EX 15' PSCO EASEMENT REC. NO. 310494 (TO REMAIN)

NORTHWEST PKWY
VARIABLE WIDTH ROW

EX ASPHALT (TO BE REMOVED AS NEEDED)

EX UNDERGROUND ELECTRIC (TO BE REMOVED TYP)

EX STORM INLET (TO REMAIN)

EX 30' PSCO EASEMENT REC. NO. 01014582 (TO REMAIN)

EX TRANSFORMER (TO REMAIN TYP)

EX ELECTRIC MANHOLE (TO REMAIN)

EX GAS METER (TO BE REMOVED)

EX STORM CULVERT (TO REMAIN)

EX GAS (TO BE REMOVED)

EX UNDERGROUND TELECOM (TO REMAIN TYP)

EX UNDERGROUND ELECTRIC (TO REMAIN TYP)

EX UNDERGROUND TELECOM (TO BE REMOVED AS NEEDED)

EX TELECOM RISER (TO REMAIN TYP)

EX PARKING LOT (TO REMAIN TYP)

EX FENCE (TO BE REMOVED AS NEEDED)

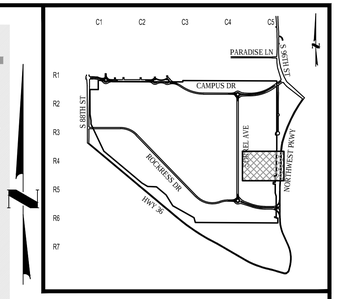
EX 26' PSCO EASEMENT REC. NO. 531607 (TO BE VACATED)

EX 30' PSCO EASEMENT REC. NO. 531606 (TO REMAIN)

EX POST (TO REMAIN TYP)

EX TELECOM VAULT (TO REMAIN TYP)

EX FENCE (TO REMAIN TYP)



KEY MAP
1"=2000'

NOTES:

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LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS
- EXISTING WATER LINE
- EXISTING STORM MAIN
- EXISTING SANITARY SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING OVERHEAD ELECTRIC
- EXISTING UNDERGROUND TELECOM
- CHECK DAM
- CONSTRUCTION FENCE
- COFFERDAM
- CULVERT PROTECTION
- CONSTRUCTION TRAILER
- CONCRETE WASHOUT AREA
- INLET PROTECTION
- LIMITS OF CONSTRUCTION
- OUTLET PROTECTION
- ROUGH CUT STREET CONTROL
- ROCK SOCK
- SEDIMENT CONTROL LOG
- SILT FENCE
- SEEDING AND MULCHING
- SOIL STOCKPILE
- SURFACE ROUGHENGING
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- VEHICLE TRACKING CONTROL
- TEMPORARY STREAM CROSSING
- EXISTING STORM SEWER
- UNDISTURBED AREA
- RUNOFF ARROWS

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40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

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Denver, Colorado 80203
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HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INITIAL - R4 C5

ISSUE DATE: 11-15-2019	PROJECT #: 190108
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 21
ES - 21 OF ES - 91

FILEPATH: P:\1901\08\ENGINEERING\EROSION\SWMP - INITIAL - 2.DWG LAYOUT: NAV(ATN) - R4 C5
11 XREFS: client logo, c-base, c-legal, c-util, lg, c-swmp-filing 1[1], key map, p-base1, p-base2, p-legal1, p-legal2, stamp - swmp
PLOTTED: THU 04/01/21 10:45:47A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 18

MATCHLINE - SEE SHEET ES - 13

MATCHLINE - SEE SHEET ES - 23

MATCHLINE - SEE SHEET ES - 19

LOT 2 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

EX FENCE (TO REMAIN)

EX LDSC WALL (TO REMAIN)

EX ROADWAY (TO REMAIN)

EX CHANNEL (TO REMAIN)

EX MH (TO REMAIN)

EX POST (TO REMAIN TYP)

EX 70' PSCO EASEMENT REC. NO. 0106267 (TO BE VACATED)

EX 10' IRRIGATION EASEMENT REC. NO. 3348883 (TO BE VACATED)

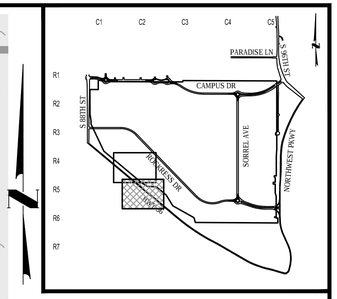
EX DIRT TRAIL (TO REMAIN)

PROPERTY BOUNDARY (TYP)

EX STREET LIGHT (TO REMAIN TYP)

HIGHWAY 36
VARIABLE WIDTH ROW

5475 5480 5435 5440 5430 5485 5480 5475 5485 5480 5475 5470 5485 5480 5455 5450 5445 5440 5435 5430 5425 5420 5415 5415



KEY MAP
1"=2000'

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LEGEND:

- RIGHT-OF-WAY
- 5264 5265 EXISTING CONTOURS
- W EXISTING WATER LINE
- ST EXISTING STORM MAIN
- SS EXISTING SANITARY SEWER
- UE E EXISTING UNDERGROUND ELECTRIC
- OE EXISTING OVERHEAD ELECTRIC
- UT EXISTING UNDERGROUND TELECOM
- CD CHECK DAM
- CF CONSTRUCTION FENCE
- CFD COFFERDAM
- CP CULVERT PROTECTION
- CT CONSTRUCTION TRAILER
- CWA CONCRETE WASHOUT AREA
- IP INLET PROTECTION
- LOC LIMITS OF CONSTRUCTION
- OP OUTLET PROTECTION
- RCS ROUGH CUT STREET CONTROL
- RS ROCK SOCK
- SCL SCL SEDIMENT CONTROL LOG
- SF SILT FENCE
- SM SEEDING AND MULCHING
- SP SOIL STOCKPILE
- SR SURFACE ROUGHENGING
- SSA STABILIZED STAGING AREA
- VTC VEHICLE TRACKING CONTROL
- TSC TEMPORARY STREAM CROSSING
- EXISTING STORM SEWER
- UNDISTURBED AREA
- RUNOFF ARROWS

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40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

HARRIS KOCHER SMITH
1120 Lincoln Street, Suite 1000
Denver, Colorado 80203
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HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INITIAL - R5 C2
SOUTHWEST E-E

ISSUE DATE: 11-15-2019 PROJECT #: 190108

DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

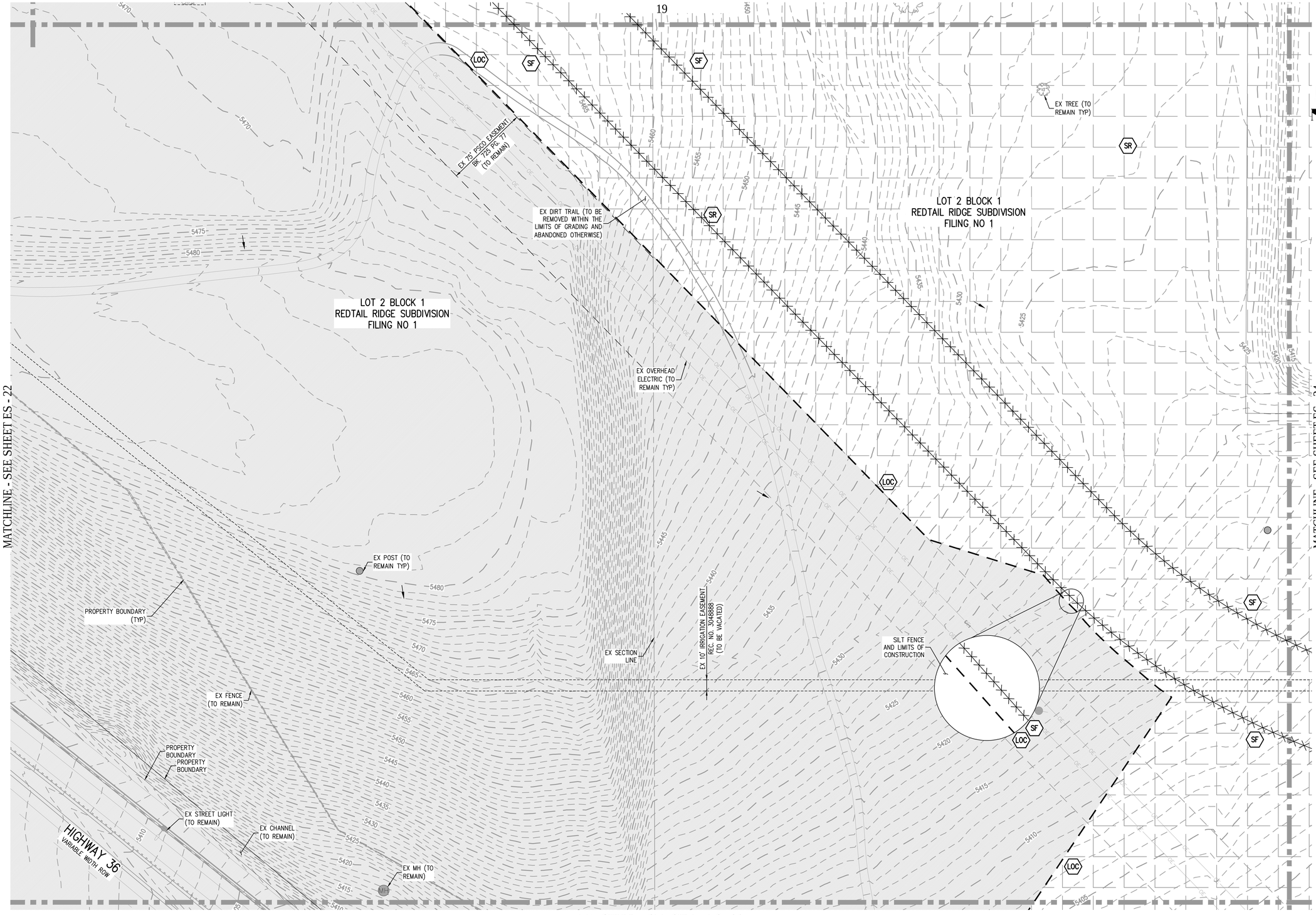
PRELIMINARY NOT FOR CONSTRUCTION

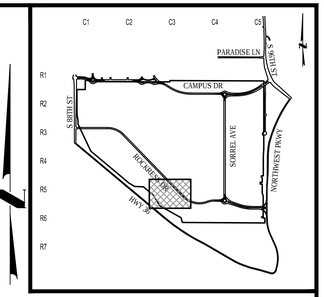
SHEET NO.
ES - 22
ES - 22 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - INITIAL - 2.DWG, LAYOUT: NAVATNY - R5 C2
11 XREFS: client logo, e-base, e-legal, e-util, lg - swmp-ltng, IU1, key map, p-base-t2, p-legal-t2, p-legal-t1, p-legal-t2, stamp - swmp
PLOTTED: THU 04/01/21 10:46:02A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 19





KEY MAP
1"=2000'

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SCALE: 1" = 40'

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DRAWN BY: MB

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BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INITIAL - R5 C3

ISSUE DATE: 11-15-2019	PROJECT #: 190108
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 23
ES - 23 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - INITIAL - 4.DWG LAYOUT: NAVATNY - R5 C3
10 XREFS: client logo, e-base, e-legal, e-util, lg - swmp-ltng, [U], key map, p-base-[U], p-legal-1, p-legal-2[U], stamp - swmp
PLOTTED: THU 04/01/21 10:46:29A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 20

MATCHLINE - SEE SHEET ES - 23

MATCHLINE - SEE SHEET ES - 25

MATCHLINE - SEE SHEET ES - 27

EX TREE (TO REMAIN TYP)

EX ASPHALT (TO REMAIN TYP)

EX UNDERGROUND ELECTRIC (TO REMAIN TYP)

EX ELECTRIC MH (TO REMAIN TYP)

LOT 1 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

EX FENCE (TO REMAIN TYP)

EX UNDERGROUND TELECOM (TO REMAIN TYP)

EX TRANSFORMER (TO REMAIN)

EX MH (TO REMAIN TYP)

EX 50' PSCO EASEMENT REC. NO. 543534 (TO REMAIN)

SORREL AVE (79' ROW)

LOT 1 BLOCK 2
REDTAIL RIDGE SUBDIVISION
FILING NO 1

EX DIRT TRAIL (TO BE REMOVED WITHIN LIMITS OF GRADING AND ABANDONED OTHERWISE)

PR ROW (TYP)

PR 24' HAUL ROUTE

CONTRACTOR TO FIELD VERIFY POSITION OF UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION OF DRAINAGE SWALE

EX POST (TO REMAIN TYP)

EX 10' IRRIGATION EASEMENT REC. NO. 3048888 (TO BE VACATED)

EX TREE (TO BE REMOVED TYP)

ROCKCRESS DR (120' ROW)

EX FENCE (TO REMAIN)

EX FENCE (TO BE REMOVED)

EX BRUSH (TO BE REMOVED TYP)

EX LIGHT (TO BE REMOVED)

EX MISC UTILITY (TO BE REMOVED TYP)

LOT 2 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

SILT FENCE AND LIMITS OF CONSTRUCTION

EX PROPERTY BOUNDARY REC. NO. 531604 (TO REMAIN)

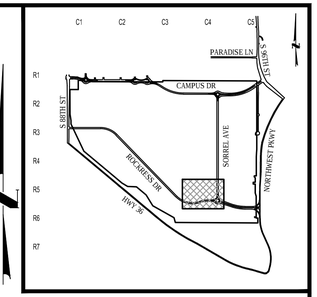
EX 40' PSCO EASEMENT REC. NO. 0110534 (TO REMAIN)

EX BUILDING (TO REMAIN)

EX DIRT TRAIL (TO BE REMOVED WITHIN LIMITS OF GRADING AND AE OTHERWISE)

TRACT F
REDTAIL RIDGE SUBDIVISION
FILING NO 1

LOT 3 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1



KEY MAP
1"=2000'

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LEGEND:

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BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INITIAL - R5 C4

ISSUE DATE: 11-15-2019 | PROJECT #: 190108

DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 24
ES - 24 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP_INITIAL - 4.DWG LAYOUT: NAWATNY - R5 C4
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PLOTTED: THU 04/01/21 10:46:46A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 21

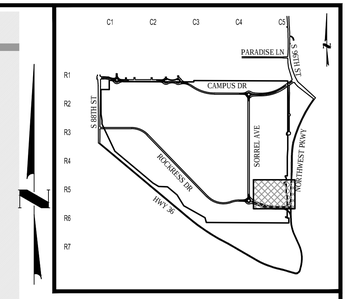
MATCHLINE - SEE SHEET ES - 24

MATCHLINE - SEE SHEET ES - 28

LOT 1 BLOCK 2
REDTAIL RIDGE SUBDIVISION
FILING NO 1

TRACT E
REDTAIL RIDGE
SUBIVISION
FILING NO 1

EX MH (TO REMAIN TYP)
EX PARKINGLOT (TO REMAIN)
EX POST (TO REMAIN TYP)
EX FENCE (TO BE REMOVED WITHIN THE THE LIMITS OF SIDEWALK CONSTRUCTION)
EX 30' PSCO EASEMENT REC. NO. 531606 (TO REMAIN)
EX CULVERT PIPE (TO REMAIN TYP)
EX TREE (TO BE REMOVED TYP)
EX TREE (TO REMAIN TYP)
EX FENCE (TO REMAIN)
EX FENCE (TO REMAIN TYP)
PR PROPERTY BOUNDARY (TYP)
SILT FENCE AND LIMITS OF CONSTRUCTION
EX STORM CULVERT (TO BE REMOVED)
EX BRUSH (TO BE REMOVED TYP)
EX ROADWAY (TO BE REMOVED AS NEEDED TYP)
TRAILER BATHROOM
SOIL STORAGE AREA 50'X120'
EX 10' IRRIGATION EASEMENT REC. NO. 304888 (TO BE VACATED)
EX CONC PAVEMENT (TO BE REMOVED TYP)
EX RIP RAP (TO BE REMOVED)
ROCKCRESS DR (120' ROW)
EX POST (TO BE REMOVED TYP)
PR ROW (TYP)
PR 24' HAUL ROUTE
EX DIRT TRAIL (TO BE REMOVED)
EX JERSEY BARRIER (TO BE REMOVED)
EX FENCE AND GATE (TO BE REMOVED)
EX ROADWAY (TO BE REMOVED AND REPLACED)
EX CURB AND GUTTER (TO BE REMOVED AND REPLACED TYP)
EX STORM CULVERT (TO REMAIN)
EX STORM INLET (TO REMAIN)
EX SIGN (TO REMAIN TYP)
EX POST (TO BE REMOVED)
NORTHWEST PKWY
VARIABLE WIDTH ROW



KEY MAP
1"=2000'

NOTES:

1. ALL EXISTING SURFACE FEATURES NOT INCLUDED WITHIN FILING NO. 1 ARE TO REMAIN UNLESS OTHERWISE NOTED. SEE SHEETS MASTER UTILITY AND SURFACE IMPROVEMENTS PLAN FOR PHASING.
2. EXISTING SURFACE FEATURES ARE TO BE REMOVED AS NEEDED TO ACCOMMODATE THE PROPOSED DRAINAGE SWALES.
3. ALL EXISTING SURFACE FEATURES EXISTING UTILITIES IN THE UNDISTURBED AREA ARE TO REMAIN UNLESS OTHERWISE NOTED.

LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS
- EXISTING WATER LINE
- EXISTING STORM MAIN
- EXISTING SANITARY SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING OVERHEAD ELECTRIC
- EXISTING UNDERGROUND TELECOM
- CHECK DAM
- CONSTRUCTION FENCE
- COFFERDAM
- CULVERT PROTECTION
- CONSTRUCTION TRAILER
- CONCRETE WASHOUT AREA
- INLET PROTECTION
- LIMITS OF CONSTRUCTION
- OUTLET PROTECTION
- ROUGH CUT STREET CONTROL
- ROCK SOCK
- SEDIMENT CONTROL LOG
- SILT FENCE
- SEEDING AND MULCHING
- SOIL STOCKPILE
- SURFACE ROUGHENGING
- STABILIZED STAGING AREA
- VEHICLE TRACKING CONTROL
- TEMPORARY STREAM CROSSING
- EXISTING STORM SEWER
- UNDISTURBED AREA
- RUNOFF ARROWS

811 Know what's below. Call before you dig.
CALL 3 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

HKS HARRIS KOCHER SMITH
1120 Lincoln Street, Suite 1000
Denver, Colorado 80203
P: 303.623.6300 F: 303.623.6311
HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INITIAL - R5 C5

ISSUE DATE: 11-15-2019	PROJECT #: 190108
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

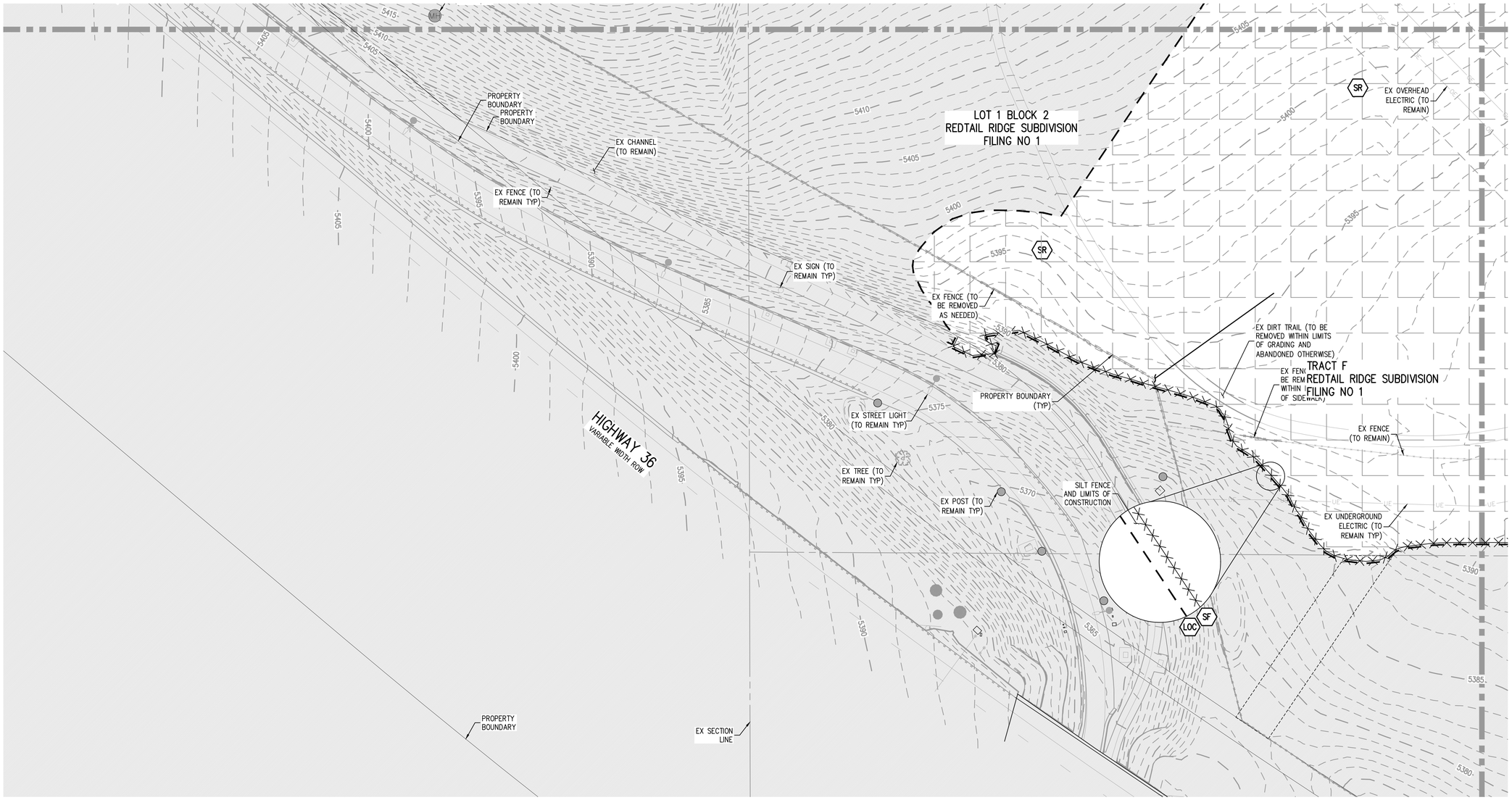
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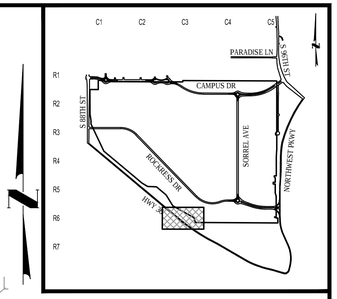
SHEET NO.
ES - 25
ES - 25 OF ES - 91

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PLOTTED: THU 04/01/21 10:47:01A BY: TIM SAYLER

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MATCHLINE - SEE SHEET ES - 23





KEY MAP
1"=2000'

NOTES:

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LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS
- EXISTING WATER LINE
- EXISTING STORM MAIN
- EXISTING SANITARY SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING OVERHEAD ELECTRIC
- EXISTING UNDERGROUND TELECOM
- CHECK DAM
- CONSTRUCTION FENCE
- COFFERDAM
- CULVERT PROTECTION
- CONSTRUCTION TRAILER
- CONCRETE WASHOUT AREA
- INLET PROTECTION
- LIMITS OF CONSTRUCTION
- OUTLET PROTECTION
- ROUGH CUT STREET CONTROL
- ROCK SOCK
- SEDIMENT CONTROL LOG
- SILT FENCE
- SEEDING AND MULCHING
- SOIL STOCKPILE
- SURFACE ROUGHENING
- STABILIZED STAGING AREA
- VEHICLE TRACKING CONTROL
- TEMPORARY STREAM CROSSING
- EXISTING STORM SEWER
- UNDISTURBED AREA
- RUNOFF ARROWS

MATCHLINE - SEE SHEET ES - 27

811 Know what's below. Call before you dig.
CALL 3 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

HARRIS KOCHER SMITH
1120 Lincoln Street, Suite 1000
Denver, Colorado 80203
P: 303.623.6300 F: 303.623.6311
HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INITIAL - R6 C3

ISSUE DATE: 11-15-2019	PROJECT #: 190108
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

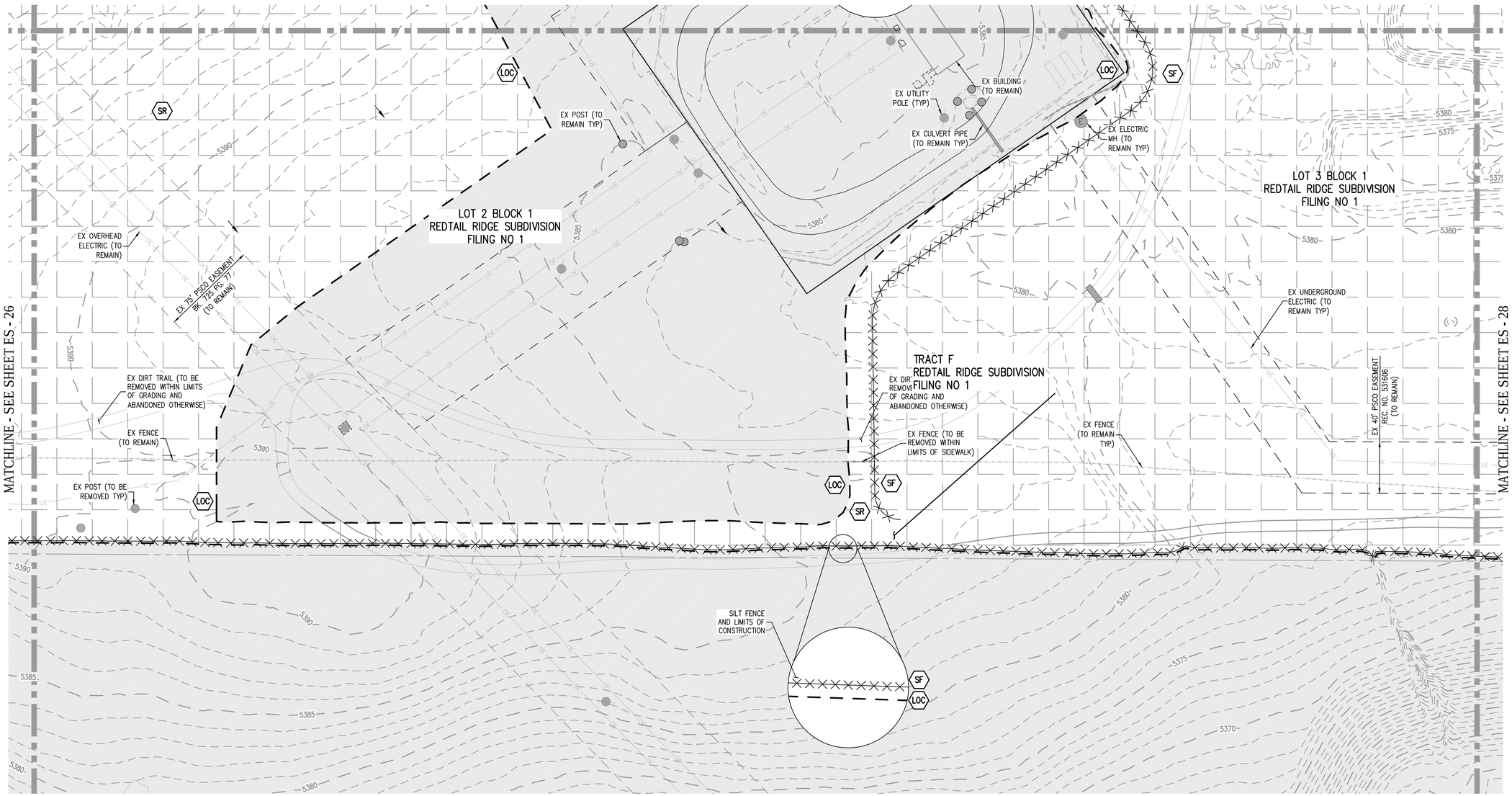
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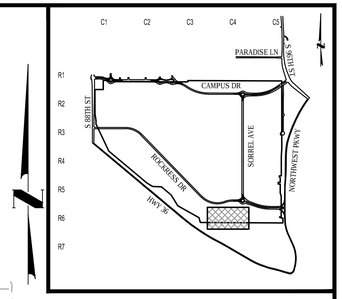
SHEET NO.
ES - 26
ES - 26 OF ES - 91

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PLOTTED: TIU 04/01/21 10:47:15A BY: TIM SAVLER

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MATCHLINE - SEE SHEET ES - 24





KEY MAP
1"=2000'

NOTES:

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LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS
- EXISTING WATER LINE
- EXISTING STORM MAIN
- EXISTING SANITARY SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING OVERHEAD ELECTRIC
- EXISTING UNDERGROUND TELECOM
- CD — CHECK DAM
- CF — CONSTRUCTION FENCE
- CFD — COFFERDAM
- CP — CULVERT PROTECTION
- CT — CONSTRUCTION TRAILER
- CWA — CONCRETE WASHOUT AREA
- IP — INLET PROTECTION
- LOC — LIMITS OF CONSTRUCTION
- OP — OUTLET PROTECTION
- RCS — ROUGH CUT STREET CONTROL
- RS — ROCK SOCK
- SCL — SEDIMENT CONTROL LOG
- SF — SILT FENCE
- SM — SEEDING AND MULCHING
- SP — SOIL STOCKPILE
- SR — SURFACE ROUGHENGING
- SSA — STABILIZED STAGING AREA
- VTC — VEHICLE TRACKING CONTROL
- TSC — TEMPORARY STREAM CROSSING
- EXISTING STORM SEWER
- UNDISTURBED AREA
- RUNOFF ARROWS

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40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

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HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INITIAL - R6 C4

ISSUE DATE: 11-15-2019	PROJECT #: 190108
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 27
ES - 27 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - INITIAL - 4.DWG LAYOUT: NAV1ATW - R6 C4
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PLOTTED: THU 04/01/21 10:47:30A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 25

MATCHLINE - SEE SHEET ES - 27

MATCHLINE - SEE SHEET ES - 29

ROCKCRESS DR
(120' ROW)

PR ROW
(TYP)

EX FENCE AND GATE
(TO BE REMOVED)

EX WALL (TO BE REMOVED AS NEEDED AND ABANDONED OTHERWISE TYP)

EX ROADWAY
(TO BE REMOVED)

EX JERSEY BARRIER
(TO BE REMOVED)

EX ROADWAY (TO BE REMOVED AND REPLACED)

PROPERTY
BOUNDARY (TYP)

LOT 3 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

EX DIRT TRAIL (TO BE REMOVED AS NEEDED AND ABANDONED OTHERWISE)

EX STORM INLET
(TO REMAIN)

EX STM (TO
REMAIN TYP)

EX 30' PSCO EASEMENT
REC. NO. 531606
(TO REMAIN)

NORTHWEST PKWY
VARIABLE WIDTH ROW

TRACT F
REDTAIL RIDGE SUBDIVISION
FILING NO 1

EX ELECTRIC MANHOLE
(TO REMAIN)

EX UNDERGROUND
ELECTRIC (TO
REMAIN TYP)

EX DIRT TRAIL
(TO BE REMOVED
WITHIN LIMITS OF
GRADING AND ABANDONED
OTHERWISE TYP)

EX FENCE (TO BE
REMOVED AS NEEDED
AND ABANDONED
OTHERWISE TYP)

LOT 4 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

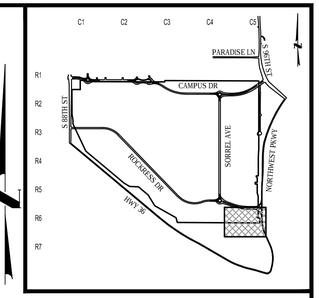
PR PROPERTY
BOUNDARY (TYP)

EX SIGN (TO
REMAIN TYP)

EX POST (TO
REMAIN TYP)

SILT FENCE
AND LIMITS OF
CONSTRUCTION

EX TREE (TO
REMAIN TYP)



KEY MAP
1"=2000'

NOTES:

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LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS
- EXISTING WATER LINE
- EXISTING STORM MAIN
- EXISTING SANITARY SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING OVERHEAD ELECTRIC
- EXISTING UNDERGROUND TELECOM
- CHECK DAM
- CONSTRUCTION FENCE
- COFFERDAM
- CULVERT PROTECTION
- CONSTRUCTION TRAILER
- CONCRETE WASHOUT AREA
- INLET PROTECTION
- LIMITS OF CONSTRUCTION
- OUTLET PROTECTION
- ROUGH CUT STREET CONTROL
- ROCK SOCK
- SEDIMENT CONTROL LOG
- SILT FENCE
- SEEDING AND MULCHING
- SOIL STOCKPILE
- SURFACE ROUGHENGING
- STABILIZED STAGING AREA
- VEHICLE TRACKING CONTROL
- TEMPORARY STREAM CROSSING
- EXISTING STORM SEWER
- UNDISTURBED AREA
- RUNOFF ARROWS

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CALL 3 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

HARRIS KOCHER SMITH
1120 Lincoln Street, Suite 1000
Denver, Colorado 80203
P: 303.623.6300 F: 303.623.6311
HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INITIAL - R6 C5

ISSUE DATE: 11-15-2019 | PROJECT #: 190108

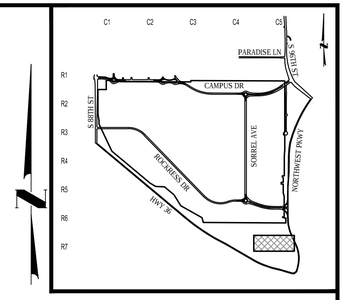
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 28
ES - 28 OF ES - 91

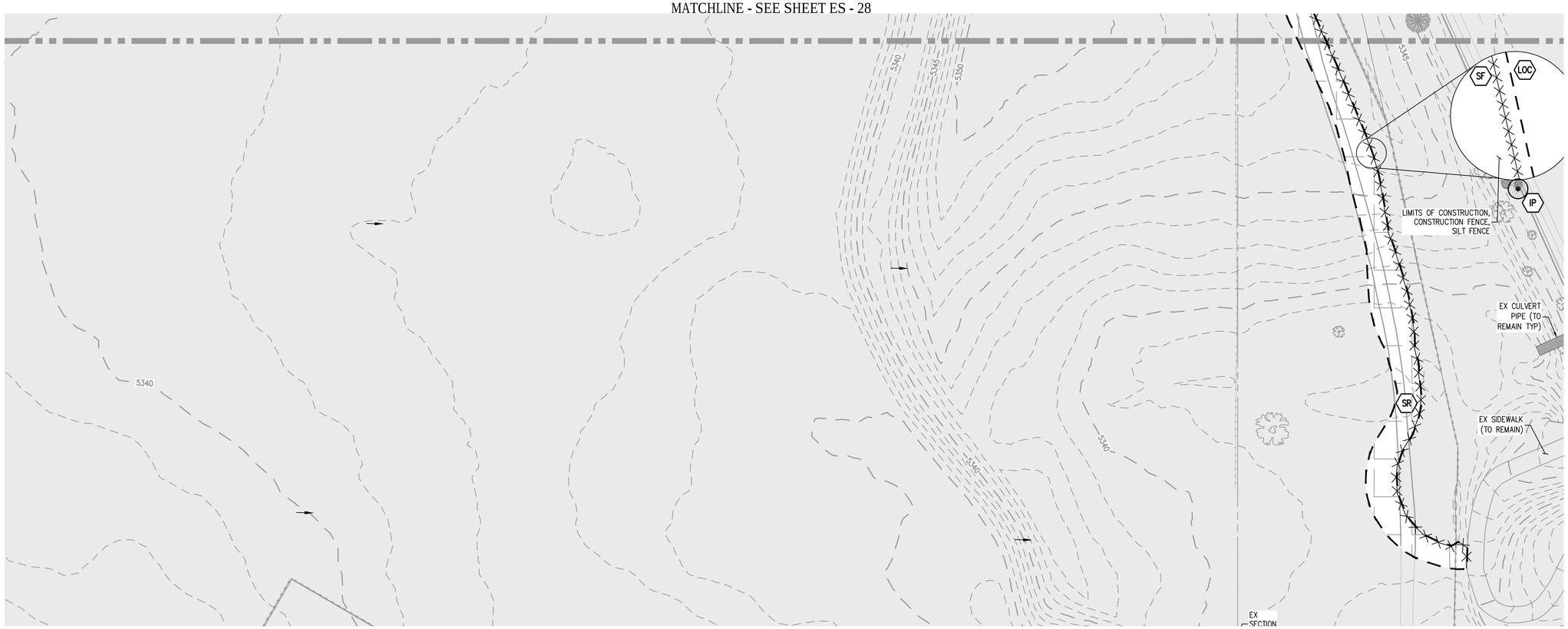
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PLOTTED: TIR(04/01/21 10:47:27A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH



KEY MAP
1"=2000'

MATCHLINE - SEE SHEET ES - 28



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LEGEND:

- RIGHT-OF-WAY
- 5264 / 5265 — EXISTING CONTOURS
- W — EXISTING WATER LINE
- ST — EXISTING STORM MAIN
- SS — EXISTING SANITARY SEWER
- UE — EXISTING UNDERGROUND ELECTRIC
- OE — EXISTING OVERHEAD ELECTRIC
- UT — EXISTING UNDERGROUND TELECOM
- CD — CHECK DAM
- CF — CONSTRUCTION FENCE
- CFD — COFFERDAM
- CRP — CULVERT PROTECTION
- CT — CONSTRUCTION TRAILER
- CWA — CONCRETE WASHOUT AREA
- IP — INLET PROTECTION
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- OP — OUTLET PROTECTION
- RCS — ROUGH CUT STREET CONTROL
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- SR — SURFACE ROUGHENING
- SSA — STABILIZED STAGING AREA
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- EXISTING STORM SEWER
- UNDISTURBED AREA
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40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

HARRIS KOCHER SMITH
1120 Lincoln Street, Suite 1000
Denver, Colorado 80203
P: 303.623.6300 F: 303.623.6311
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BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INITIAL - R7 C5

ISSUE DATE: 11-15-2019 | PROJECT #: 190108

DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

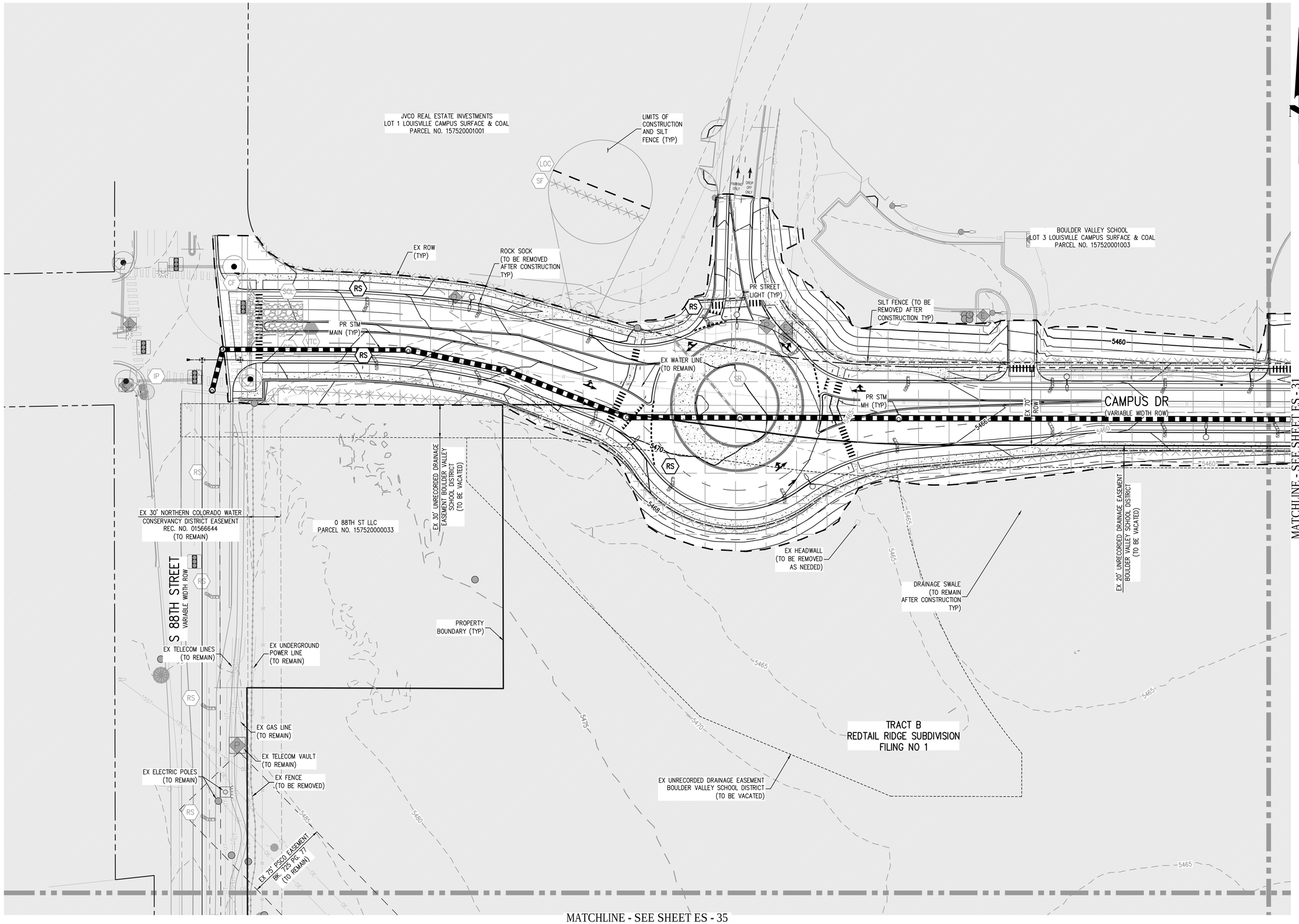
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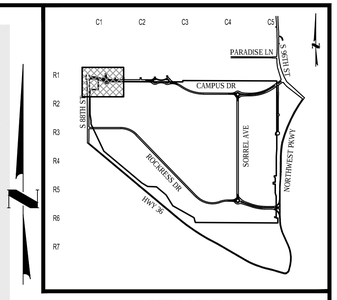
SHEET NO.
ES - 29
ES - 29 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - INITIAL - 4.DWG LAYOUT: NAVIATNV - R7C5
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PLOTTED: TIR(04/01/21 10:48:02A BY: TIM SAYLER

04-05-2021

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH





KEY MAP
1"=2000'

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LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS
- PROPOSED CONTOURS
- EXISTING WATER LINE
- EXISTING STORM MAIN
- EXISTING SANITARY SEWER
- EXISTING UNDERGROUND ELECTR
- EXISTING OVERHEAD ELECTRIC
- EXISTING UNDERGROUND TELECO
- PROPOSED WATER
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- CHECK DAM
- CONSTRUCTION FENCE
- COFFERDAM
- CULVERT PROTECTION
- CONSTRUCTION TRAILER
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- SOIL STOCKPILE
- SURFACE ROUGHENGING
- STABILIZED STAGING AREA
- VEHICLE TRACKING CONTROL
- TEMPORARY STREAM CROSSING
- EXISTING STORM SEWER
- UNDISTURBED AREA
- RUNOFF ARROWS
- AREA OF DRAINAGE DISTURBANC

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40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

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Denver, Colorado 80203
P: 303.623.6300 F: 303.623.6311
HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INTERIM - R1 C1

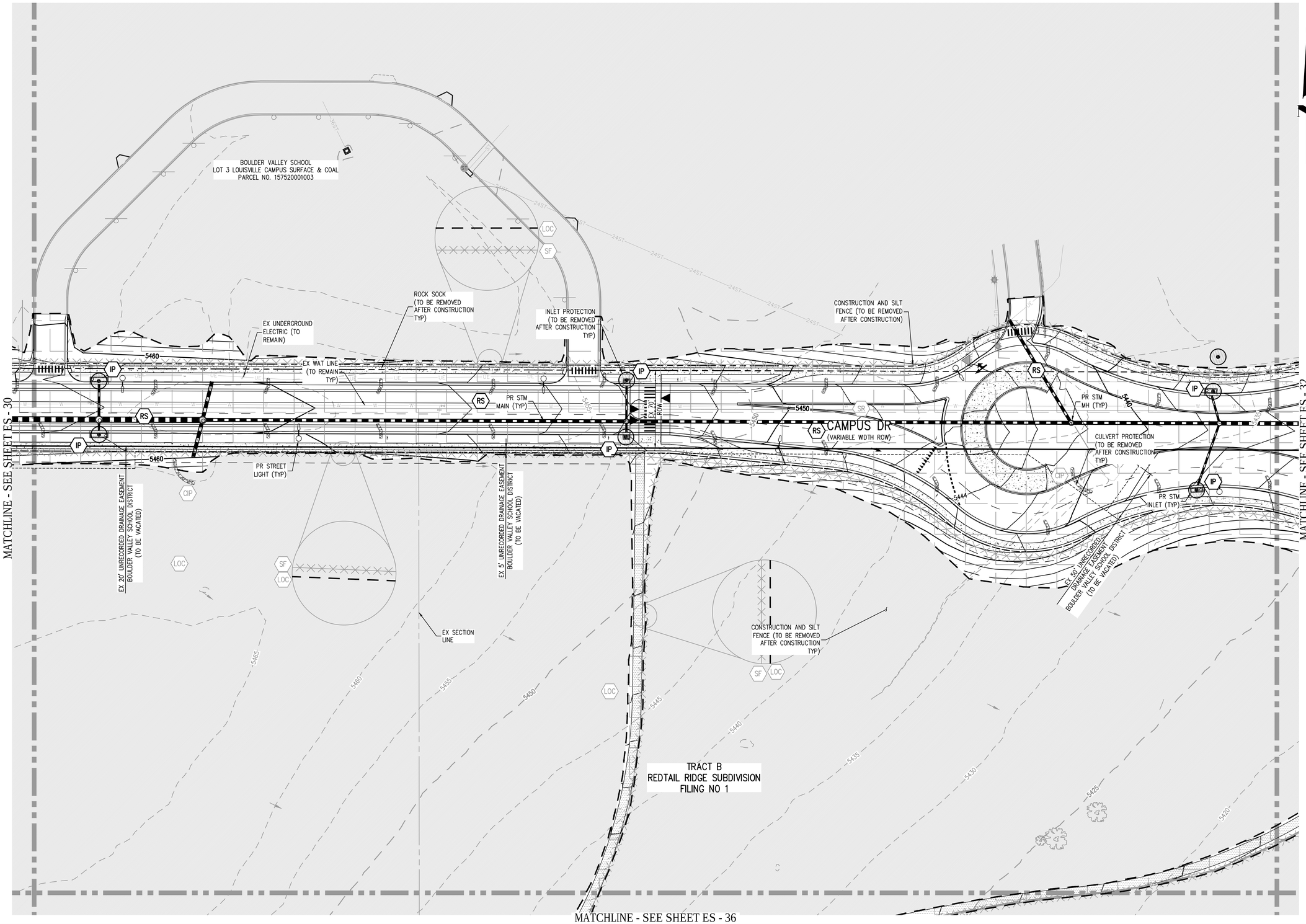
ISSUE DATE: 11-15-2019	PROJECT #: 190108
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

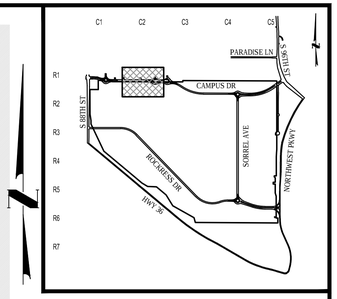
PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 30
ES - 30 OF ES - 91

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11 XREFs: client logo, e-base, e-legal, e-tail, key map, p-base-f1, p-base-f2(1), p-legal-f1, stamp - swmp, swmp - initial
PLOTTED: TIR(04/01/21 10:48:43A BY: TIM SAVLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH.





KEY MAP
1"=2000'

NOTES:

1. ALL EXISTING SURFACE FEATURES NOT INCLUDED WITHIN FILING NO. 1 ARE TO REMAIN UNLESS OTHERWISE NOTED. SEE SHEETS MASTER UTILITY AND SURFACE IMPROVEMENTS PLAN FOR PHASING.
2. EXISTING SURFACE FEATURES ARE TO BE REMOVED AS NEEDED TO ACCOMMODATE THE PROPOSED DRAINAGE SWALES.
3. ALL EXISTING SURFACE FEATURES EXISTING UTILITIES IN THE UNDISTURBED AREA ARE TO REMAIN UNLESS OTHERWISE NOTED.

LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS (5264 / 5265)
- PROPOSED CONTOURS (5264 / 5265)
- EXISTING WATER LINE (W)
- EXISTING STORM MAIN (ST)
- EXISTING SANITARY SEWER (SS)
- EXISTING UNDERGROUND ELECTR (UE)
- EXISTING OVERHEAD ELECTRIC (OE)
- EXISTING UNDERGROUND TELECO (UT)
- PROPOSED WATER (W)
- PROPOSED STORM SEWER (ST)
- PROPOSED SANITARY SEWER (SS)
- CHECK DAM (CD)
- CONSTRUCTION FENCE (CF)
- COFFERDAM (CFD)
- CULVERT PROTECTION (CP)
- CONSTRUCTION TRAILER (CT)
- CONCRETE WASHOUT AREA (CWA)
- INLET PROTECTION (IP)
- LIMITS OF CONSTRUCTION (LOC)
- OUTLET PROTECTION (OP)
- ROUGH CUT STREET CONTROL (RCS)
- ROCK SOCK (RS)
- SEDIMENT CONTROL LOG (SCL)
- SILT FENCE (SF)
- SEEDING AND MULCHING (SM)
- SOIL STOCKPILE (SP)
- SURFACE ROUGHENGING (SR)
- STABILIZED STAGING AREA (SSA)
- VEHICLE TRACKING CONTROL (VTC)
- TEMPORARY STREAM CROSSING (TSC)
- EXISTING STORM SEWER
- UNDISTURBED AREA
- RUNOFF ARROWS
- AREA OF DRAINAGE DISTURBANC

811 Know what's below. Call before you dig.
CALL 3 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

HARRIS KOCHER SMITH
1120 Lincoln Street, Suite 1000
Denver, Colorado 80203
P: 303.623.6300 F: 303.623.6311
HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INTERIM - R1 C2

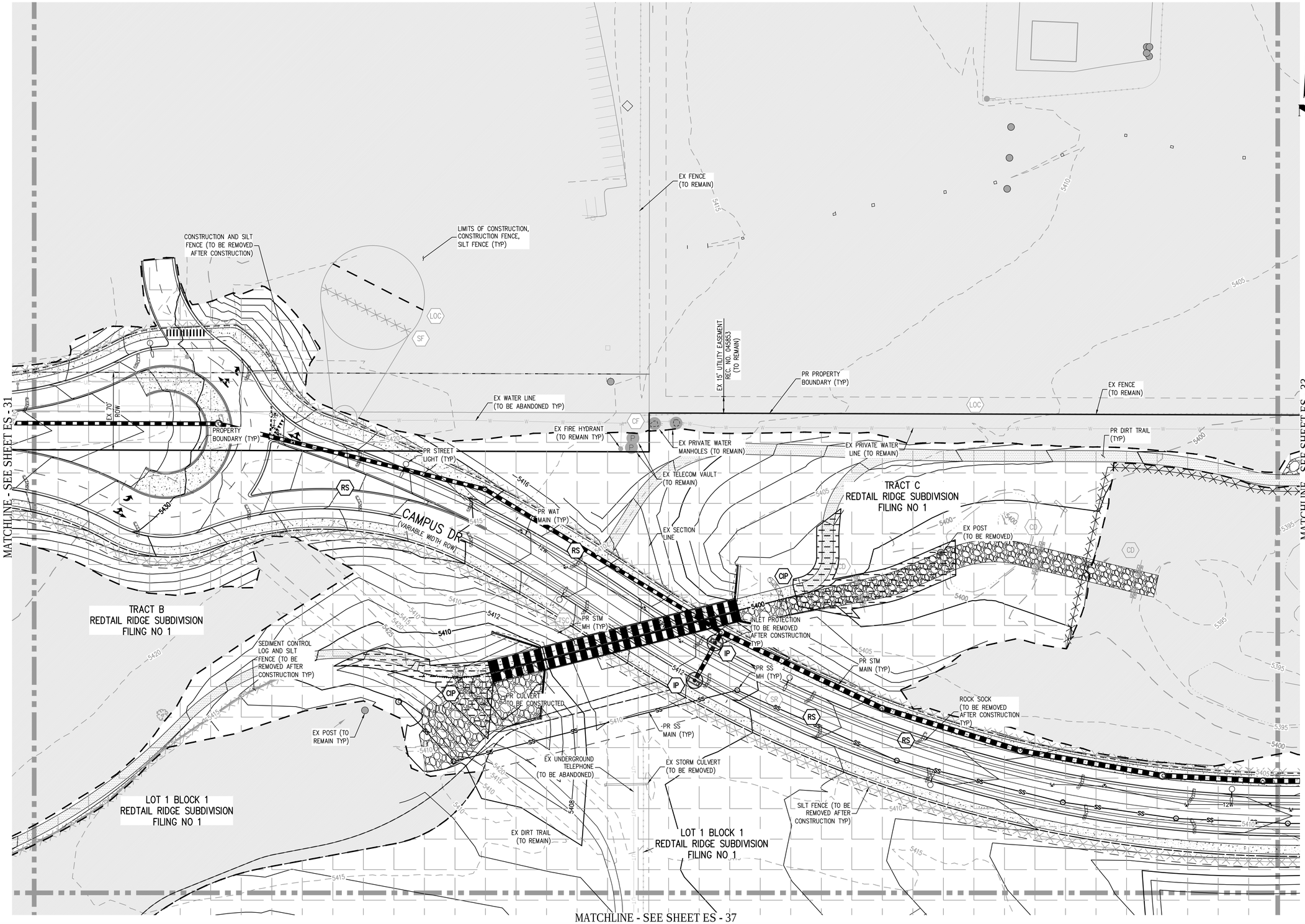
ISSUE DATE: 11-15-2019	PROJECT #: 190108
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

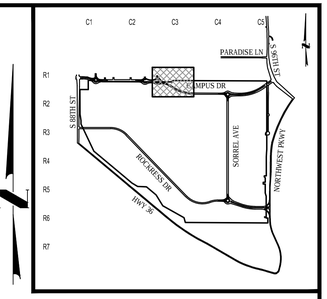
PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 31
ES - 31 OF ES - 91

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PLOTTED: THU 04/01/21 10:48:56A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH.





KEY MAP
1"=2000'

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LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS
- PROPOSED CONTOURS
- EXISTING WATER LINE
- EXISTING STORM MAIN
- EXISTING SANITARY SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING OVERHEAD ELECTRIC
- EXISTING UNDERGROUND TELECO
- PROPOSED WATER
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- CHECK DAM
- CONSTRUCTION FENCE
- COFFERDAM
- CULVERT PROTECTION
- CONSTRUCTION TRAILER
- CONCRETE WASHOUT AREA
- INLET PROTECTION
- LIMITS OF CONSTRUCTION
- OUTLET PROTECTION
- ROUGH CUT STREET CONTROL
- ROCK SOCK
- SEDIMENT CONTROL LOG
- SILT FENCE
- SEEDING AND MULCHING
- SOIL STOCKPILE
- SURFACE ROUGHENING
- STABILIZED STAGING AREA
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SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

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BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INTERIM - R1 C3

ISSUE DATE: 11-15-2019 | PROJECT #: 190108

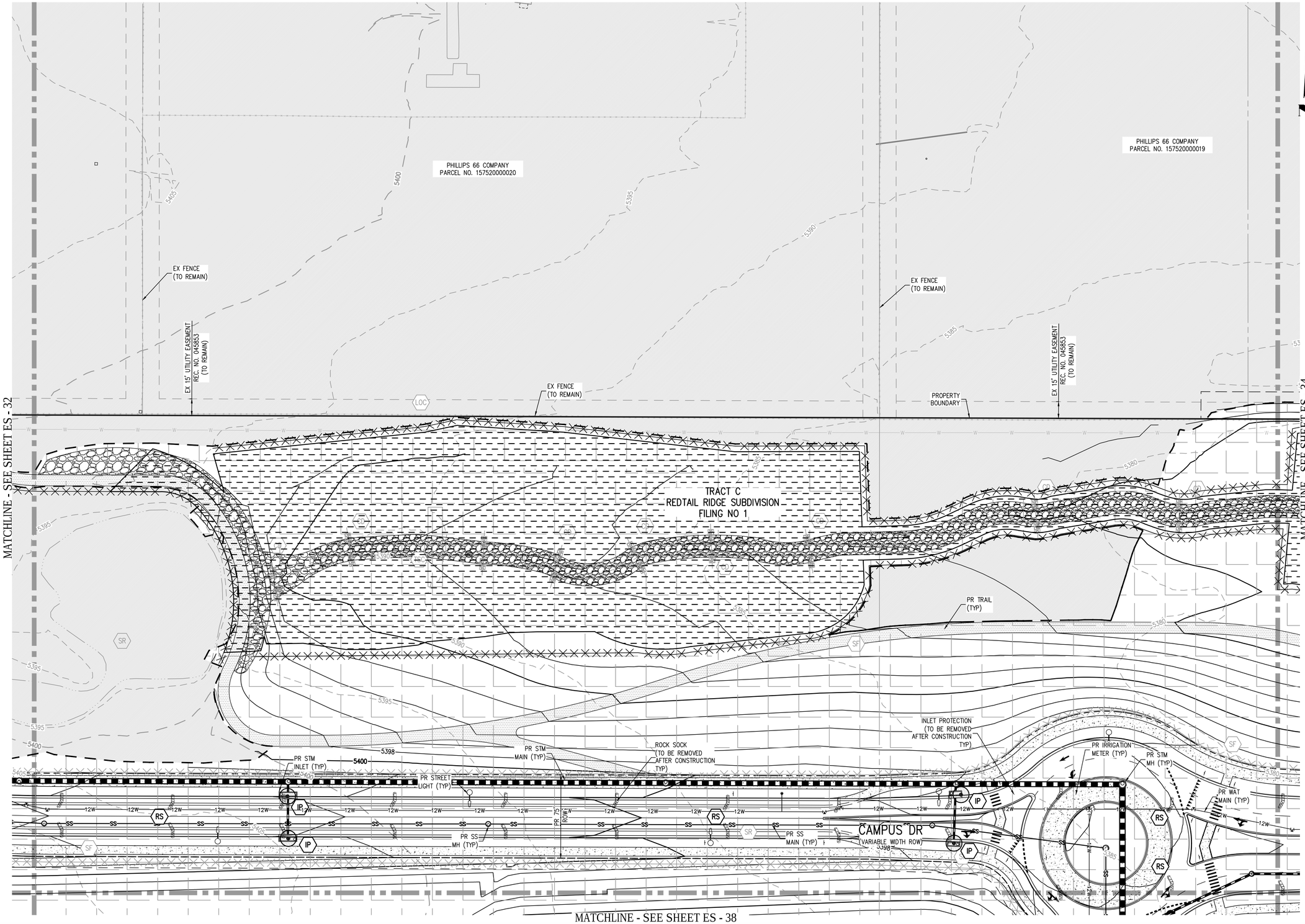
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

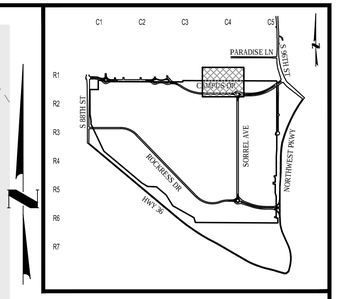
PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 32
ES - 32 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP_INTERIM_1.DWG LAYOUT: NAVATIV - R1 C2
11 XREFs: client logo, e-base, e-legal, e-util, key map, p-base-f2[1], p-legal-f1, p-base-f1, p-base-f2[1], p-legal-f1, stamp - swmp, swmp - initial
PLOTTED: THU 04/01/21 10:48:13A BY: TIM SAYLER

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KEY MAP
1"=2000'

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LEGEND:

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- EXISTING CONTOURS
- PROPOSED CONTOURS
- EXISTING WATER LINE
- EXISTING STORM MAIN
- EXISTING SANITARY SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING OVERHEAD ELECTRIC
- EXISTING UNDERGROUND TELECO
- PROPOSED WATER
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- CHECK DAM
- CONSTRUCTION FENCE
- COFFERDAM
- CULVERT PROTECTION
- CONSTRUCTION TRAILER
- CONCRETE WASHOUT AREA
- INLET PROTECTION
- LIMITS OF CONSTRUCTION
- OUTLET PROTECTION
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SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

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HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INTERIM - R1 C4

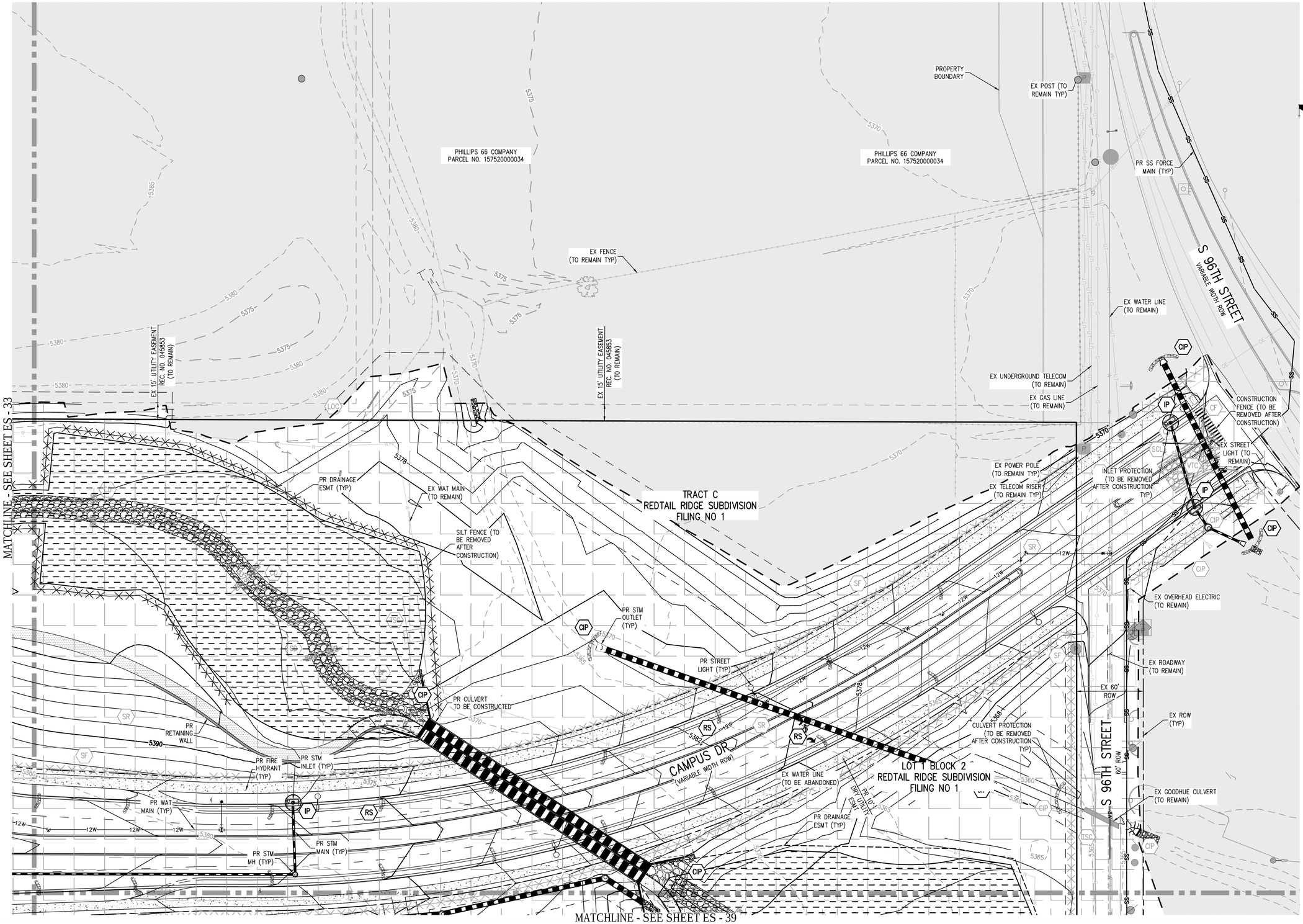
ISSUE DATE: 11-15-2019	PROJECT #: 190108
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

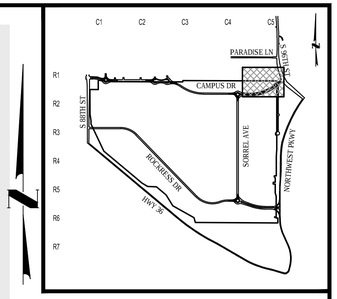
PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 33
ES - 33 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP_INTERIM_1.DWG LAYOUT: NAVIATNV_R1 C4
11 XREFs: client logo, c-base, e-topl, e-util, key map, p-base-f2[1], p-topl-f1, p-util-f1, stamp - swmp, swmp - intial
PLOTTED: THU 04/01/21 10:49:33A BY: TIM SAYLER

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1"=2000'

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- EXISTING STORM MAIN
- EXISTING SANITARY SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING OVERHEAD ELECTRIC
- EXISTING UNDERGROUND TELECO
- PROPOSED WATER
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- CD — CHECK DAM
- CF — CONSTRUCTION FENCE
- COFFERDAM
- CP — CULVERT PROTECTION
- CT — CONSTRUCTION TRAILER
- CWA — CONCRETE WASHOUT AREA
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- RCS — ROUGH CUT STREET CONTROL
- RS — ROCK SOCK
- SCL — SEDIMENT CONTROL LOG
- SF — SILT FENCE
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40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

HARRIS KOCHER SMITH
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Denver, Colorado 80203
P: 303.623.6300 F: 303.623.6311
HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INTERIM - R1 C5

ISSUE DATE: 11-15-2019 | PROJECT #: 190108

DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 34
ES - 34 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - INTERIM - 1.DWG LAYOUT: NAMATNY - R1 C5
11 XREFS: client topo, e-base, e-sign, e-util, lev map, p-base-f1, p-base-f2[1], p-sign-f1, p-util-f1, stamp - swmp, swmp - initial
PLOTTED: THU 04/01/21 10:48:52A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 30

EX 7' BK. (TO R...

EX 75' PSCO EASEMENT BK. 725 PG. 77 (TO REMAIN)

EX UNDERGROUND ELECTRIC LINE (TO REMAIN)

EX TELECOM LINES (TO REMAIN)

EX POST (TO REMAIN TYP)

EX TELECOM VAULT (TO REMAIN)

EX GAS LINE (TO REMAIN)

EX OVERHEAD ELECTRIC (TYP)

S 88TH STREET
VARIABLE WIDTH ROW

EX 30' NORTHERN COLORADO WATER CONSERVANCY DISTRICT EASEMENT REC. NO. 01566644

TRACT B
REDTAIL RIDGE SUBDIVISION
FILING NO 1

EX TRANSFORMER (TO REMAIN)

EX WATER MH (TO REMAIN)

PR 6' TRAIL

SEDIMENT CONTROL LOG AND SILT FENCE (TO BE REMOVED AFTER CONSTRUCTION TYP)

PR FUTURE DETENTION POND (TO BE BUILT WITH REDTAIL RIDGE SUBDIVISION FILING NO. 2)

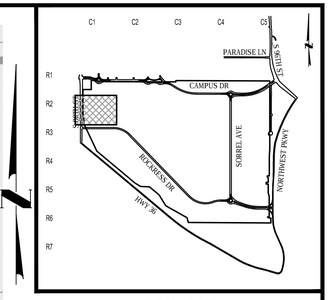
PR INLET PROTECTION (TO BE REMOVED AFTER CONSTRUCTION TYP)

LIMITS OF CONSTRUCTION, SILT FENCE, AND SEDIMENT CONTROL LOG

LOT 1 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

MATCHLINE - SEE SHEET ES - 36

MATCHLINE - SEE SHEET ES - 40



KEY MAP
1"=2000'

NOTES:

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LEGEND:

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- EXISTING CONTOURS
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40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

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BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INTERIM - R2 C1

ISSUE DATE: 11-15-2019	PROJECT #: 190108
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 35
ES - 35 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - INTERIM - 1.DWG LAYOUT: NAVATNY - R2 C1
11 XREFs: client logo, e-base, e-legal, e-utl, key map, pBase-f1, pBase-f2(1), p-legal-f1, p-utl-f1, stamp - swmp, swmp - initial
PLOTTED: TIR(04/01/21 10:50:12A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 31

MATCHLINE - SEE SHEET ES - 35

MATCHLINE - SEE SHEET ES - 37

MATCHLINE - SEE SHEET ES - 41

TRACT B
REDTAIL RIDGE SUBDIVISION
FILING NO 1

LOT 1 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

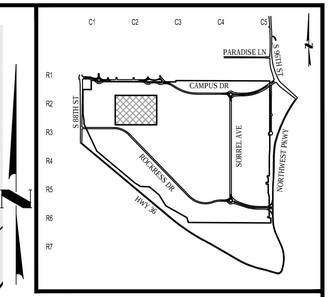
SEDIMENT CONTROL LOG AND SILT FENCE (TO BE REMOVED AFTER CONSTRUCTION TYP)

LIMITS OF CONSTRUCTION, SILT FENCE, AND SEDIMENT CONTROL LOG

EX SECTION LINE

PR DRAINAGE ESMT

PR 8' TRAIL



KEY MAP
1"=2000'

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- EXISTING OVERHEAD ELECTRIC
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- CD — CHECK DAM
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CHECKED BY: MSM
DRAWN BY: MB

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BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INTERIM - R2 C2

ISSUE DATE: 11-15-2019 | PROJECT #: 190108

DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 36
ES - 36 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - INTERIM - LDWG LAYOUT\ NAVATNY - R2 C2
11 XREFs: client logo, e-base, e-sign, e-util, key map, p-base-f1, p-base-f2[2], p-sign-f1, p-util-f1, stamp - swmp, swmp - initial
PLOTTED: THU 04/01/21 10:50:27A BY: TIM SAVLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 32

MATCHLINE - SEE SHEET ES - 36

MATCHLINE - SEE SHEET ES - 38

MATCHLINE - SEE SHEET ES - 42

EX FENCE (TO REMAIN TYP)

EX POST (TO REMAIN TYP)

EX UNDERGROUND TELECOM (TO REMAIN TYP)

EX SECTION LINE

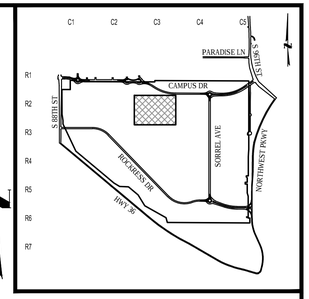
EX DIRT TRAIL (TO REMAIN TYP)

EX UNDERGROUND MH (TO REMAIN TYP)

EX FENCE (TO REMAIN TYP)

LOT 1 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

LOT 1 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1



KEY MAP
1"=2000'

NOTES:

1. ALL EXISTING SURFACE FEATURES NOT INCLUDED WITHIN FILING NO. 1 ARE TO REMAIN UNLESS OTHERWISE NOTED. SEE SHEETS MASTER UTILITY AND SURFACE IMPROVEMENTS PLAN FOR PHASING.
2. EXISTING SURFACE FEATURES ARE TO BE REMOVED AS NEEDED TO ACCOMMODATE THE PROPOSED DRAINAGE SWALES.
3. ALL EXISTING SURFACE FEATURES EXISTING UTILITIES IN THE UNDISTURBED AREA ARE TO REMAIN UNLESS OTHERWISE NOTED.

LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS
- PROPOSED CONTOURS
- EXISTING WATER LINE
- EXISTING STORM MAIN
- EXISTING SANITARY SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING OVERHEAD ELECTRIC
- EXISTING UNDERGROUND TELECOM
- PROPOSED WATER
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- CD — CHECK DAM
- CF — CONSTRUCTION FENCE
- CFD — COFFERDAM
- CP — CULVERT PROTECTION
- CT — CONSTRUCTION TRAILER
- CWA — CONCRETE WASHOUT AREA
- IP — INLET PROTECTION
- LOC — LIMITS OF CONSTRUCTION
- OP — OUTLET PROTECTION
- RCS — ROUGH CUT STREET CONTROL
- RS — ROCK SOCK
- SCL — SEDIMENT CONTROL LOG
- SF — SILT FENCE
- SM — SEEDING AND MULCHING
- SP — SOIL STOCKPILE
- SR — SURFACE ROUGHENGING
- SSA — STABILIZED STAGING AREA
- VTC — VEHICLE TRACKING CONTROL
- TSC — TEMPORARY STREAM CROSSING
- EXISTING STORM SEWER
- UNDISTURBED AREA
- RUNOFF ARROWS
- AREA OF DRAINAGE DISTURBANCE

811 Know what's below. Call before you dig.

CALL 3 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

HARRIS KOCHER SMITH
1120 Lincoln Street, Suite 1000
Denver, Colorado 80203
P: 303.623.6300 F: 303.623.6311
HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INTERIM - R2 C3

ISSUE DATE: 11-15-2019	PROJECT #: 190108
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 37
ES - 37 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP_INTERIM - 2.DWG LAYOUT: NAVAITNV_R2 C2
11 XREFs: client logo, c-base, e-topi, e-util, key map, p-base-0 [1], p-base-1, p-base-2 [1], p-topi-1, p-util-1, stamp - swmp, swmp - intial
PLOTTED: THU 04/01/21 10:51:10 BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 33

MATCHLINE - SEE SHEET ES - 37

MATCHLINE - SEE SHEET ES - 39

MATCHLINE - SEE SHEET ES - 43

EX POST (TO REMAIN TYP)

SILT FENCE (TO BE REMOVED AFTER CONSTRUCTION)

LOT 1 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

PR STM MH (TYP)

PR STM MAIN (TYP)

EX POST (TO REMAIN)

SORREL AVE (79' ROW)

PR STREET LIGHT (TYP)

PR 99' DRY UTIL ESMT

PR 30' UTILITY ESMT

SILT FENCE (TO BE REMOVED AFTER CONSTRUCTION TYP)

PR STM INLET (TYP)

INLET PROTECTION (TO BE REMOVED AFTER CONSTRUCTION TYP)

ROCK SOCK (TO BE REMOVED AFTER CONSTRUCTION TYP)

PR 79' ROW

EX FENCE (TO BE REMOVED WITHIN THE LIMITS OF ROW AND ABANDONED OTHERWISE)

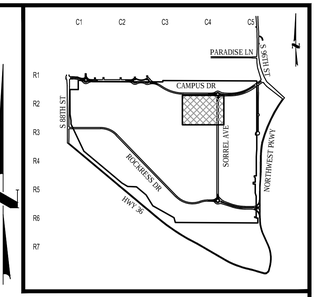
PR ROW (TYP)

EX FENCE (TO BE REMOVED WITHIN ROW AND ABANDONED OTHERWISE)

PR WAT MAIN (TYP)

PR SS MAIN (TYP)

PR SS MH (TYP)



KEY MAP
1"=2000'

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LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS (5264 / 5265)
- PROPOSED CONTOURS (5264 / 5265)
- EXISTING WATER LINE (W)
- EXISTING STORM MAIN (ST)
- EXISTING SANITARY SEWER (SS)
- EXISTING UNDERGROUND ELECTRIC (UE)
- EXISTING OVERHEAD ELECTRIC (OE)
- EXISTING UNDERGROUND TELECOM (UT)
- PROPOSED WATER (W)
- PROPOSED STORM SEWER (ST)
- PROPOSED SANITARY SEWER (SS)
- CHECK DAM (CD)
- CONSTRUCTION FENCE (CF)
- COFFERDAM (CFD)
- CULVERT PROTECTION (CP)
- CONSTRUCTION TRAILER (CT)
- CONCRETE WASHOUT AREA (CWA)
- INLET PROTECTION (IP)
- LIMITS OF CONSTRUCTION (LOC)
- OUTLET PROTECTION (OP)
- ROUGH CUT STREET CONTROL (RCS)
- ROCK SOCK (RS)
- SEDIMENT CONTROL LOG (SCL)
- SILT FENCE (SF)
- SEEDING AND MULCHING (SM)
- SOIL STOCKPILE (SP)
- SURFACE ROUGHENGING (SR)
- STABILIZED STAGING AREA (SSA)
- VEHICLE TRACKING CONTROL (VTC)
- TEMPORARY STREAM CROSSING (TSC)
- EXISTING STORM SEWER
- UNDISTURBED AREA
- RUNOFF ARROWS
- AREA OF DRAINAGE DISTURBANCE

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40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

HARRIS KOCHER SMITH
1120 Lincoln Street, Suite 1000
Denver, Colorado 80203
P: 303.623.6300 F: 303.623.6311
HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INTERIM - R2 C4

ISSUE DATE: 11-15-2019 | PROJECT #: 190108

DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 38
ES - 38 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - INTERIM - 2.DWG LAYOUT: NAMATNY - R2 C4
11 XREFS: client topo, e-base, e-legal, e-util, key map, p-base-f1, p-base-f2[1], p-topo-f1, p-util-f1, stamp - swmp, swmp - initial
PLOTTED: THU 04/01/21 10:51:26A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 34

MATCHLINE - SEE SHEET ES - 38

MATCHLINE - SEE SHEET ES - 44

ROCK SOCK (TO BE REMOVED AFTER CONSTRUCTION TYP)

STABILIZED STAGING AREA (TO BE REMOVED AFTER CONSTRUCTION)

STOCK PILE AREA AND SILT FENCE (TO BE REMOVED AFTER CONSTRUCTION)

TRACT D
REDTAIL RIDGE
SUBDIVISION
FILING NO 1

EX BUILDING (TO BE REMOVED)

CONSTRUCTION TRAILER (TO BE REMOVED AFTER CONSTRUCTION)

TRAILER BATHROOM (TO BE REMOVED AFTER CONSTRUCTION)

CONCRETE WASHOUT AREA (TO BE REMOVED AFTER CONSTRUCTION)

PR 8' TRAIL

PR POND FOREBAY (TYP)

PR 30' UTILITY ESMT

EX FENCE (TO REMAIN TYP)

PR 20' UTILITY ESMT

LOT 1 BLOCK 2
REDTAIL RIDGE SUBDIVISION
FILING NO 1

CULVERT PROTECTION (TO BE REMOVED AFTER CONSTRUCTION TYP)

PR CULVERT (TYP)

EX UNDERGROUND TELECOMS (TO REMAIN)

EX WATER LINE (TO REMAIN)

LIMITS OF CONSTRUCTION, CONSTRUCTION FENCE, SILT FENCE (TYP)

PR DRAINAGE ESMT (TYP)

EX FENCE (TO REMAIN TYP)

EX POWER POLE (TO REMAIN TYP)

SILT FENCE (TO BE REMOVED AFTER CONSTRUCTION TYP)

EX GAS LINE (TO REMAIN)

PR PROPERTY BOUNDARY (TYP)

EX TELECOM RISER (TO REMAIN)

EX ROW (TYP)

EX STORM CULVERT (TO REMAIN)

PR 14' SW

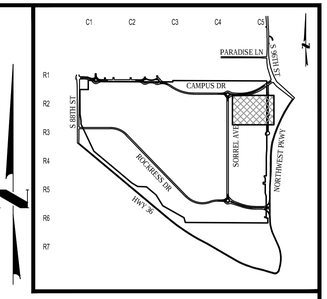
TRACT E
REDTAIL RDIGE
SUBDIVISION
FILING NO 1

PR LOT LINE (TYP)

S 96TH STREET
60' ROW

PR 10' DRY UTILITY ESMT

EX 60' ROW



KEY MAP
1"=2000'

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- PROPOSED CONTOURS
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- RUNOFF ARROWS
- AREA OF DRAINAGE DISTURBANCE

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40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

HARRIS KOCHER SMITH
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Denver, Colorado 80203
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HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INTERIM - R2 C5

ISSUE DATE: 11-15-2019 | PROJECT #: 190108

DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 39
ES - 39 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - INTERIM - 2.DWG LAYOUT: NAVATNY - R2 C5
11 XREFs: cover logo, e-base, e-legal, e-util, key map, p-base-f, p-base-f2(1), p-legal-ft, p-util-ft, xlamp, xswmp, swmp - initial
PLOTTED: THU 04/01/21 10:51:42A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 35

EX TRANSFORMER (TO REMAIN TYP)

PR FUTURE DETENTION POND (TO BE BUILT WITH REDTAIL RIDGE SUBDIVISION FILING NO. 2)

SEDIMENT CONTROL LOG AND SILT FENCE (TO BE REMOVED AFTER CONSTRUCTION TYP)

LOT 1 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

EX 75' PSCO EASEMENT BK 725 PG. 77 (TO REMAIN)

EX TELECOM VAULT (TO REMAIN)

EX UNDERGROUND TELECOM LINES (TO REMAIN TYP)

EX ELECTRIC POLE (TO REMAIN)

S 88TH STREET
VARIABLE WIDTH ROW

EX 12.00' SIDEWALK

EX OVERHEAD ELECTRIC (TO REMAIN TYP)

LOT 2 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

EX 10' IRRIGATION EASEMENT REC. NO. 3046886 (TO BE VACATED)

EX GAS LINE (TO REMAIN)

EX GAS LINE (TO BE REMOVED)

PROPERTY BOUNDARY

EX TELECOM VAULT (TO REMAIN)

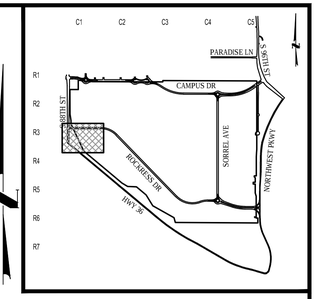
HIGHWAY 36
VARIABLE WIDTH ROW

EX FENCE (TO REMAIN TYP)

EX CHANNEL (TO REMAIN TYP)

MATCHLINE - SEE SHEET ES - 41

MATCHLINE - SEE SHEET ES - 45



KEY MAP
1"=2000'

NOTES:

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40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

HARRIS KOCHER SMITH
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Denver, Colorado 80203
P: 303.623.6300 F: 303.623.6311
HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INTERIM - R3 C1

ISSUE DATE: 11-15-2019 | PROJECT #: 190108

DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 40
ES - 40 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP_INTERIM_2.DWG LAYOUT: NAVATNY_R3 C1
11 XREFs: civil logo, e-base, e-legal, e-tail, key map, p-base-f, p-base-f2(1), p-legal-f, p-tail-f1, stamp - swmp, swmp - initial
PLOTTED: THU 04/01/21 10:51:58A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 36

MATCHLINE - SEE SHEET ES - 40

MATCHLINE - SEE SHEET ES - 42

MATCHLINE - SEE SHEET ES - 46

EX TELECOM MH (TYP)

EX UNDERGROUND TELECOM LINE (TO REMAIN TYP)

SILT FENCE (TO BE REMOVED AFTER CONSTRUCTION TYP)

EX POST (TO REMAIN TYP)

PR WAT MAIN (TYP)

EX FENCE (TO REMAIN TYP)

EX 75' PSCO EASEMENT BK 726 PG 771 (TO REMAIN)

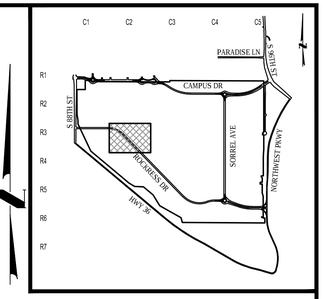
EX OVERHEAD ELECTRIC (TO REMAIN TYP)

LOT 1 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

LOT 2 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

EX ELECTRIC POLE (TO REMAIN)

EX 20' PSCO EASEMENT REC. NO. 0100578? (TO BE VACATED)



KEY MAP
1"=2000'

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SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

HKS HARRIS KOCHER SMITH
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P: 303.623.6300 F: 303.623.6311
HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INTERIM - R3 C2

ISSUE DATE: 11-15-2019 | PROJECT #: 190108

DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 41
ES - 41 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - INTERIM - 2.DWG LAYOUT: MAWATNY - R2 C2
11 XREFS: client logo, c-base, c-topa, c-util, key map, p-base-01, p-base-02[1], p-gas[1], p-util[1], stamp - swmp, swmp - intial
PLOTTED: THU 04/01/21 10:52:12A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 37

EX UNDERGROUND TELECOM LINE (TO REMAIN)

EX SECTION LINE

EX UNDERGROUND TELECOM (TO BE REMOVED AS NEEDED AND ABANDONED OTHERWISE)

EX FENCE (TO REMAIN TYP)

EX POST (TO REMAIN TYP)

EX MH (TO REMAIN)

EX FH (TO BE REMOVED)

EX DIRT TRAIL (TO BE REMOVED WITHIN LIMITS OF GADING AND ABANDONED OTHERWISE TYP)

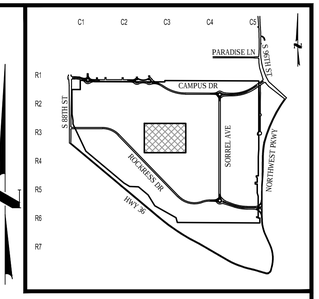
LOT 1 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 2

LOT 1 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

MATCHLINE - SEE SHEET ES - 41

MATCHLINE - SEE SHEET ES - 43

MATCHLINE - SEE SHEET ES - 47



KEY MAP
1"=2000'

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BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INTERIM - R3 C3

ISSUE DATE: 11-15-2019 | PROJECT #: 190108

DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 42
ES - 42 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - INTERIM - 2.DWG LAYOUT: NAWATNV - R3 C3
11 XREFs: client logo, e-base, e-legal, e-cell, key map, pBase0-f1, pBase-f1, p-leg0-f1, p-cell-f1, stamp - swmp, swmp - initial
PLOTTED: THU 04/01/21 10:52:32A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 38

MATCHLINE - SEE SHEET ES - 42

MATCHLINE - SEE SHEET ES - 44

MATCHLINE - SEE SHEET ES - 48

EX FENCE (TO REMAIN TYP)

EX CULVERT PIPE (TO REMAIN TYP)

EX TELECOM MH (TO REMAIN)

EX POST (TO REMAIN TYP)

EX UNDERGROUND TELECOM (TO BE REMOVED WITHIN ROW AND ABANDONED OTHERWISE)

PR SS MAIN (TYP)

PR 99' DRY UTIL ESMT

SORREL AVE (120' ROW)

PR WAT MAIN (TYP)

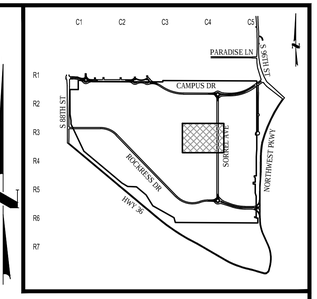
PR STREET LIGHT (TYP)

LOT 1 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

SILT FENCE (TO BE REMOVED AFTER CONSTRUCTION TYP)

ROCK SOCK (TO BE REMOVED AFTER CONSTRUCTION TYP)

PR 79' ROW



KEY MAP
1"=2000'

NOTES:

1. ALL EXISTING SURFACE FEATURES NOT INCLUDED WITHIN FILING NO. 1 ARE TO REMAIN UNLESS OTHERWISE NOTED. SEE SHEETS MASTER UTILITY AND SURFACE IMPROVEMENTS PLAN FOR PHASING.
2. EXISTING SURFACE FEATURES ARE TO BE REMOVED AS NEEDED TO ACCOMMODATE THE PROPOSED DRAINAGE SWALES.
3. ALL EXISTING SURFACE FEATURES EXISTING UTILITIES IN THE UNDISTURBED AREA ARE TO REMAIN UNLESS OTHERWISE NOTED.

LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS
- PROPOSED CONTOURS
- EXISTING WATER LINE
- EXISTING STORM MAIN
- EXISTING SANITARY SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING OVERHEAD ELECTRIC
- EXISTING UNDERGROUND TELECOM
- PROPOSED WATER
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- CHECK DAM
- CONSTRUCTION FENCE
- COFFERDAM
- CULVERT PROTECTION
- CONSTRUCTION TRAILER
- CONCRETE WASHOUT AREA
- INLET PROTECTION
- LIMITS OF CONSTRUCTION
- OUTLET PROTECTION
- ROUGH CUT STREET CONTROL
- ROCK SOCK
- SEDIMENT CONTROL LOG
- SILT FENCE
- SEEDING AND MULCHING
- SOIL STOCKPILE
- SURFACE ROUGHENGING
- STABILIZED STAGING AREA
- VEHICLE TRACKING CONTROL
- TEMPORARY STREAM CROSSING
- EXISTING STORM SEWER
- UNDISTURBED AREA
- RUNOFF ARROWS
- AREA OF DRAINAGE DISTURBANCE

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CALL 3 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

HARRIS KOCHER SMITH
1120 Lincoln Street, Suite 1000
Denver, Colorado 80203
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HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INTERIM - R3 C4

ISSUE DATE: 11-15-2019	PROJECT #: 190108
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 43
ES - 43 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - INTERIM - 2.DWG LAYOUT: NAVATNY - R3 C4
11 XREFs: client logo, e-base, e-sign, e-util, key map, p-base-1, p-base-2[1], p-sign-1, p-util-1, stamp - swmp, swmp - initial
PLOTTED: THU 04/01/21 10:52:47A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 39

MATCHLINE - SEE SHEET ES - 43

MATCHLINE - SEE SHEET ES - 49

EX BLDG (TO REMAIN)

EX GAS METER (TO BE REMOVED)

EX GAS LINE (TO BE REMOVED TYP)

EX FH (TO REMAIN TYP)

EX WATER LINE (TO REMAIN)

EX WATER VALVE (TO REMAIN)

EX STREET LIGHT (TO REMAIN TYP)

S 96TH STREET
60' ROW

EX UNDERGROUND TELECOM (TYP)

EX TELECOM VAULT (TO REMAIN TYP)

EX ELECTRIC VAULT (TO REMAIN TYP)

EX OVERHEAD ELECTRIC (TO REMAIN TYP)

EX FENCE (TO REMAIN TYP)

EX POLICE COMMUNICATION TOWER (TO REMAIN)

PR 10' DRY UTILITY ESMT

PR 12' ACCESS ESMT

EX STM MH (TO REMAIN TYP)

EX CULVERT PIPE (TO REMAIN)

PR SS MAIN (TYP)

EX UNDERGROUND ELECTRIC (TO BE REMOVED)

EX CONC PAD (TO REMAIN TYP)

EX POST (TO REMAIN TYP)

EX MH (TO REMAIN TYP)

EX STREET LIGHT (TO BE REMOVED TYP)

EX TRANSFORMER (TO REMAIN TYP)

SILT FENCE (TO BE REMOVED AFTER CONSTRUCTION TYP)

LOT 1 BLOCK 2
REDTAIL RIDGE SUBDIVISION
FILING NO 1

EX FENCE (TO BE REMOVED)

EX GAS METER (TO REMAIN)

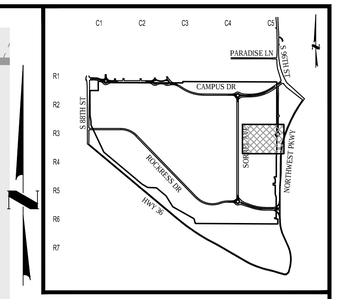
TRACT E
REDTAIL RDIGE
SUBDIVISION
FILING NO 1

PR LOT LINE (TYP)

EX UNDERGROUND ELECTRIC (TO BE REMOVED)

LIMITS OF CONSTRUCTION AND SILT FENCE (TYP)

NORTHWEST PKWY
VARIABLE WIDTH ROW



KEY MAP
1"=2000'

NOTES:

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3. ALL EXISTING SURFACE FEATURES EXISTING UTILITIES IN THE UNDISTURBED AREA ARE TO REMAIN UNLESS OTHERWISE NOTED.

LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS
- PROPOSED CONTOURS
- EXISTING WATER LINE
- EXISTING STORM MAIN
- EXISTING SANITARY SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING OVERHEAD ELECTRIC
- EXISTING UNDERGROUND TELECOM
- PROPOSED WATER
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- CHECK DAM
- CONSTRUCTION FENCE
- COFFERDAM
- CULVERT PROTECTION
- CONSTRUCTION TRAILER
- CONCRETE WASHOUT AREA
- INLET PROTECTION
- LIMITS OF CONSTRUCTION
- OUTLET PROTECTION
- ROUGH CUT STREET CONTROL
- ROCK SOCK
- SEDIMENT CONTROL LOG
- SILT FENCE
- SEEDING AND MULCHING
- SOIL STOCKPILE
- SURFACE ROUGHENING
- STABILIZED STAGING AREA
- VEHICLE TRACKING CONTROL
- TEMPORARY STREAM CROSSING
- EXISTING STORM SEWER
- UNDISTURBED AREA
- RUNOFF ARROWS
- AREA OF DRAINAGE DISTURBANCE

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40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

HARRIS KOCHER SMITH
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Denver, Colorado 80203
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HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INTERIM - R3 C5

ISSUE DATE: 11-15-2019 | PROJECT #: 190108

DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

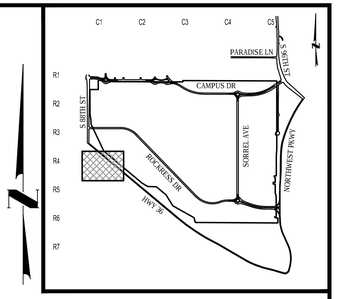
SHEET NO.
ES - 44
ES - 44 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP_INTERIM_3.DWG LAYOUT: NAVIATNV_R3 C5
11 XREFs: client logo, e-base, e-legal, e-util, key map, p-base-f1, p-base-f2[1], p-legal-f1, p-util-f1, stamp - swmp, swmp - initial
PLOTTED: THU 04\01\21 10:52:28A BY: TIM SNYDER

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MATCHLINE - SEE SHEET ES - 40





KEY MAP
1"=2000'

NOTES:

1. ALL EXISTING SURFACE FEATURES NOT INCLUDED WITHIN FILING NO. 1 ARE TO REMAIN UNLESS OTHERWISE NOTED. SEE SHEETS MASTER UTILITY AND SURFACE IMPROVEMENTS PLAN FOR PHASING.
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LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS
- PROPOSED CONTOURS
- EXISTING WATER LINE
- EXISTING STORM MAIN
- EXISTING SANITARY SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING OVERHEAD ELECTRIC
- EXISTING UNDERGROUND TELECOM
- PROPOSED WATER
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- CHECK DAM
- CONSTRUCTION FENCE
- COFFERDAM
- CULVERT PROTECTION
- CONSTRUCTION TRAILER
- CONCRETE WASHOUT AREA
- INLET PROTECTION
- LIMITS OF CONSTRUCTION
- OUTLET PROTECTION
- ROUGH CUT STREET CONTROL
- ROCK SOCK
- SEDIMENT CONTROL LOG
- SILT FENCE
- SEEDING AND MULCHING
- SOIL STOCKPILE
- SURFACE ROUGHENGING
- STABILIZED STAGING AREA
- VEHICLE TRACKING CONTROL
- TEMPORARY STREAM CROSSING
- EXISTING STORM SEWER
- UNDISTURBED AREA
- RUNOFF ARROWS
- AREA OF DRAINAGE DISTURBANCE

MATCHLINE - SEE SHEET ES - 46

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CALL 3 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

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Denver, Colorado 80203
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HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INTERIM - R4 C1
WEST D

ISSUE DATE: 11-15-2019	PROJECT #: 190108
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 45
ES - 45 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP -INTERIM - 2.DWG LAYOUT: NAVATNY - R4 C1
11 XREFs: client logo, e-base, e-legal, e-util, key map, p-base-f1, p-base-f2(1), p-legal-f1, p-util-f1, stamp - swmp, swmp - initial
PLOTTED: TIR| 04/01/21 10:53:46A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 41

MATCHLINE - SEE SHEET ES - 45

MATCHLINE - SEE SHEET ES - 47

MATCHLINE - SEE SHEET ES - 50

LOT 2 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

EX POST (TO REMAIN TYP)

EX OVERHEAD ELECTRIC (TO REMAIN TYP)

EX CONC PAD (TO REMAIN TYP)

EX 75' PSCO EASEMENT BK. 725 PG. 77 (TO REMAIN)

PR WATER MAIN (TYP)

SILT FENCE (TO BE REMOVED AFTER CONSTRUCTION)

EX MH (TO REMAIN TYP)

EX 20' PSCO EASEMENT REC. NO. 0100528? (TO BE VACATED)

EX ELECTRIC POLE (TO REMAIN TYP)

EX CHANNEL (TO REMAIN TYP)

EX SECTION LINE

EX UNDERGROUND TELECOM (TO BE REMOVED AS NEEDED AND ABANDONED OTHERWISE)

EX TELECOM MH (TO REMAIN TYP)

EX CHANNEL (TO BE REMOVED AS NEEDED AND ABANDONED OTHERWISE)

EX UNDERGROUND TELECOM (TO REMAIN TYP)

EX 20' PSCO EASEMENT REC. NO. 0100528? (TO BE VACATED)

EX CULVERT PIPE (TO REMAIN TYP)

EX 10' IRRIGATION EASEMENT REC. NO. 3048886 (TO BE VACATED)

PROPERTY BOUNDARY

EX FENCE (TO REMAIN TYP)

HIGHWAY 36
VARIABLE WIDTH ROW

EX STREET LIGHT (TO REMAIN TYP)

EX SECTION LINE

EX 10' IRRIGATION EASEMENT REC. NO. 3048886 (TO BE VACATED)

PR FUTURE DETENTION POND (TO BE BUILT WITH REDTAIL RIDGE SUBDIVISION FILING NO. 2)

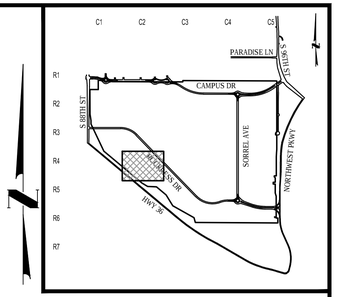
EX DIRT TRAIL (TO REMAIN)

LIMITS OF CONSTRUCTION AND SILT FENCE (TYP)

EX ELEC MH (TO REMAIN TYP)

EX ELEC PULL BOX (TO REMAIN)

EX 20' PSCO EASEMENT REC. NO. 0100528? (TO BE VACATED)



KEY MAP
1"=2000'

NOTES:

1. ALL EXISTING SURFACE FEATURES NOT INCLUDED WITHIN FILING NO. 1 ARE TO REMAIN UNLESS OTHERWISE NOTED. SEE SHEETS MASTER UTILITY AND SURFACE IMPROVEMENTS PLAN FOR PHASING.
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LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS
- PROPOSED CONTOURS
- EXISTING WATER LINE
- EXISTING STORM MAIN
- EXISTING SANITARY SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING OVERHEAD ELECTRIC
- EXISTING UNDERGROUND TELECOM
- PROPOSED WATER
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- CHECK DAM
- CONSTRUCTION FENCE
- COFFERDAM
- CULVERT PROTECTION
- CONSTRUCTION TRAILER
- CONCRETE WASHOUT AREA
- INLET PROTECTION
- LIMITS OF CONSTRUCTION
- OUTLET PROTECTION
- ROUGH CUT STREET CONTROL
- ROCK SOCK
- SEDIMENT CONTROL LOG
- SILT FENCE
- SEEDING AND MULCHING
- SOIL STOCKPILE
- SURFACE ROUGHENGING
- STABILIZED STAGING AREA
- VEHICLE TRACKING CONTROL
- TEMPORARY STREAM CROSSING
- EXISTING STORM SEWER
- UNDISTURBED AREA
- RUNOFF ARROWS
- AREA OF DRAINAGE DISTURBANCE

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40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

HARRIS KOCHER SMITH
1120 Lincoln Street, Suite 1000
Denver, Colorado 80203
P: 303.623.6300 F: 303.623.6311
HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INTERIM - R4 C2

ISSUE DATE: 11-15-2019	PROJECT #: 190108
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 46
ES - 46 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - INTERIM - 2.DWG LAYOUT: NAWATNY - R4 C2
11 XREFS: client logo, e-base, e-legal, e-util, key map, pPhase1-f1, p-phase-2[1], p-legal-f1, p-util-f1, sump - swmp, swmp - initial
PLOTTED: TIR(04/01/21 10:54:02A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 42

MATCHLINE - SEE SHEET ES - 46

MATCHLINE - SEE SHEET ES - 48

MATCHLINE - SEE SHEET ES - 51

LOT 1 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 2

LOT 1 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

EX CONC PAD (TO REMAIN TYP)

EX POST (TO REMAIN TYP)

EX 40' PSCO EASEMENT REC. NO. 290792 (TO BE VACATED)

SILT FENCE (TO BE REMOVED AFTER CONSTRUCTION)

EX ASPHALT (TO REMAIN TYP)

EX CHANNEL (TO BE REMOVED AS NEEDED AND ABANDONED OTHERWISE)

EX UNDERGROUND TELECOM (TO BE REMOVED TYP)

EX 75' PSCO EASEMENT BK 785 PG 71 (TO REMAIN)

EX WAT MAIN (TYP)

EX FH (TO BE REMOVED TYP)

EX OVERHEAD ELECTRIC (TO REMAIN TYP)

EX ELEC POLE (TO REMAIN TYP)

EX 20' PSCO EASEMENT REC. NO. 0100356? (TO BE VACATED)

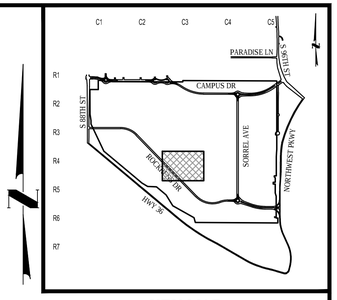
EX TELECOM MH (TO REMAIN TYP)

EX ELECTRIC MH (TO REMAIN TYP)

EX MH (TO REMAIN TYP)

EX GAS LINE (TO BE REMOVED TYP)

EX 26' PSCO EASEMENT REC. NO. 0063945? (TO BE VACATED)



KEY MAP
1"=2000'

NOTES:

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- EXISTING CONTOURS
- PROPOSED CONTOURS
- EXISTING WATER LINE
- EXISTING STORM MAIN
- EXISTING SANITARY SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING OVERHEAD ELECTRIC
- EXISTING UNDERGROUND TELECOM
- PROPOSED WATER
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- CD — CHECK DAM
- CF — CONSTRUCTION FENCE
- CFD — COFFERDAM
- CP — CULVERT PROTECTION
- CT — CONSTRUCTION TRAILER
- CWA — CONCRETE WASHOUT AREA
- IP — INLET PROTECTION
- LOC — LIMITS OF CONSTRUCTION
- OP — OUTLET PROTECTION
- RCS — ROUGH CUT STREET CONTROL
- RS — ROCK SOCK
- SCL — SEDIMENT CONTROL LOG
- SF — SILT FENCE
- SM — SEEDING AND MULCHING
- SP — SOIL STOCKPILE
- SR — SURFACE ROUGHENING
- SSA — STABILIZED STAGING AREA
- VTC — VEHICLE TRACKING CONTROL
- TSC — TEMPORARY STREAM CROSSING
- EXISTING STORM SEWER
- UNDISTURBED AREA
- RUNOFF ARROWS
- AREA OF DRAINAGE DISTURBANCE

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40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

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BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INTERIM - R4 C3

ISSUE DATE: 11-15-2019 | PROJECT #: 190108

DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 47
ES - 47 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - INTERIM - 2.DWG LAYOUT: NAVATVY - R4 C3
11 XREFS: client logo, e-base, e-legal, e-cell, key map, pBase-f1, pBase-2[1], pHeight-f1, pLeft-f1, stamp - swmp, swmp - initial
PLOTTED: TBI 04/01/21 10:54:18A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 43

MATCHLINE - SEE SHEET ES - 47

MATCHLINE - SEE SHEET ES - 49

MATCHLINE - SEE SHEET ES - 52

LOT 1 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

SORREL AVE
(120' ROW)

EX CHANNEL (TO REMAIN TYP)

EX POST (TO REMAIN TYP)

EX CULVERT PIPE (TO REMAIN TYP)

EX ASPHALT (TO REMAIN TYP)

EX SECTION LINE

PR STREET LIGHT (TYP)

PR WAT MAIN (TYP)

PR SS MAIN (TYP)

ROCK SOCK (TO BE REMOVED AFTER CONSTRUCTION TYP)

SILT FENCE (TO BE REMOVED AFTER CONSTRUCTION TYP)

EX 40' PSCO EASEMENT REC. NO. 290792 (TO BE VACATED)

EX GAS LINE (TO BE REMOVED)

EX 100' PSCO EASEMENT REC. NO. 006705371 (TO REMAIN)

EX UNDERGROUND ELECTRIC (TO REMAIN TYP)

PROPERTY BOUNDARY

EX FH (TO REMAIN TYP)

EX TELECOM MH (TO REMAIN TYP)

EX TELECOM TISER (TO REMAIN TYP)

EX TRANSFORMER (TO REMAIN TYP)

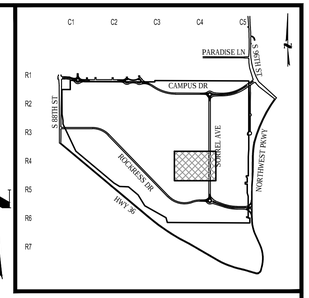
EX UNDERGROUND TELECOM (TO BE REMOVED WITHIN ROW AND ABANDONED OTHERWISE TYP)

EX 26' PSCO EASEMENT REC. NO. 00639459 (TO BE VACATED)

EX 50' PSCO EASEMENT REC. NO. 543534 (TO REMAIN)

EX ELECTRIC MH (TYP)

EX 26' PSCO EASEMENT REC. NO. 537657 (TO BE VACATED)



KEY MAP
1"=2000'

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LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS
- PROPOSED CONTOURS
- EXISTING WATER LINE
- EXISTING STORM MAIN
- EXISTING SANITARY SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING OVERHEAD ELECTRIC
- EXISTING UNDERGROUND TELECOM
- PROPOSED WATER
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- CHECK DAM
- CONSTRUCTION FENCE
- COFFERDAM
- CULVERT PROTECTION
- CONSTRUCTION TRAILER
- CONCRETE WASHOUT AREA
- INLET PROTECTION
- LIMITS OF CONSTRUCTION
- OUTLET PROTECTION
- ROUGH CUT STREET CONTROL
- ROCK SOCK
- SEDIMENT CONTROL LOG
- SILT FENCE
- SEEDING AND MULCHING
- SOIL STOCKPILE
- SURFACE ROUGHENING
- STABILIZED STAGING AREA
- VEHICLE TRACKING CONTROL
- TEMPORARY STREAM CROSSING
- EXISTING STORM SEWER
- UNDISTURBED AREA
- RUNOFF ARROWS
- AREA OF DRAINAGE DISTURBANCE

811 Know what's below. Call before you dig.

CALL 3 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

HARRIS KOCHER SMITH
1120 Lincoln Street, Suite 1000
Denver, Colorado 80203
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HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INTERIM - R4 C4

ISSUE DATE: 11-15-2019 PROJECT #: 190108

DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 48
ES - 48 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - INTERIM - 3.DWG LAYOUT: NAVATNY - R4 C4
11 XREFs: cover logo, e-base, e-legal, e-util, key map, p-base-1, p-base-2[2], p-legal-1, p-util-1, stamp, swmp, swmp - initial
PLOTTED: THU 04/01/21 10:54:37A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 44

MATCHLINE - SEE SHEET ES - 48

MATCHLINE - SEE SHEET ES - 53

TRACT E
REDTAIL RIDGE
SUBIVISION
FILING NO 1

LOT 1 BLOCK 2
REDTAIL RIDGE SUBDIVISION
FILING NO 1

EX CULVERT PIPE
(TO REMAIN TYP)

EX MH (TO
REMAIN TYP)

PR
FORCE
MAIN

PR WAT
MAIN

EX 25' PSCO EASEMENT
REC. NO. 01000400
(TO REMAIN)

EX 15' PSCO EASEMENT
REC. NO. 310494
(TO REMAIN)

PR 12'
SW

PR LOT LINE
(TYP)

SILT FENCE (TO BE
REMOVED AFTER
CONSTRUCTION TYP)

EX UNDERGROUND
ELECTRIC (TO BE
REMOVED AS NEEDED
AND ABANDONED
OTHERWISE)

LIMITS OF CONSTRUCTION
AND SILT FENCE (TYP)

ROCK SOCK
(TO BE REMOVED
AFTER CONSTRUCTION)

INLET PROTECTION
(TO BE REMOVED
AFTER CONSTRUCTION
TYP)

EX STM MAIN
(TO REMAIN TYP)

NORTHWEST PKWY
VARIABLE WIDTH ROW

EX 40' PSCO EASEMENT
REC. NO. 290792
(PORTION TO REMAIN)

EX 30' PSCO EASEMENT
REC. NO. 01014582
(TO REMAIN)

EX TRANSFORMER
(TO REMAIN TYP)

EX ELECTRIC MH
(TO REMAIN)

EX STM RIP-RAP (TO BE
REMOVED AS NEEDED AND
ABANDONED OTHERWISE)

EX TELECOM
VAULT (TO
REMAIN TYP)

EX ASPHALT
PARKING LOT
(TO REMAIN TYP)

EX TELECOM TO (TO BE
REMOVED AS NEEDED AND
ABANDONED OTHERWISE TYP)

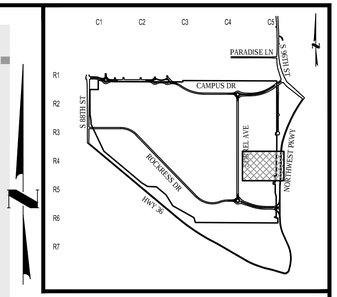
EX TELECOM
RISER (TO
REMAIN TYP)

EX 26' PSCO EASEMENT
REC. NO. 531607
(TO BE VACATED)

EX 30' PSCO EASEMENT
REC. NO. 531606
(TO REMAIN)

EX POST (TO
REMAIN TYP)

ROCK SOCK
(TO BE REMOVED
AFTER CONSTRUCTION)



KEY MAP
1"=2000'

NOTES:

1. ALL EXISTING SURFACE FEATURES NOT INCLUDED WITHIN FILING NO. 1 ARE TO REMAIN UNLESS OTHERWISE NOTED. SEE SHEETS MASTER UTILITY AND SURFACE IMPROVEMENTS PLAN FOR PHASING.
2. EXISTING SURFACE FEATURES ARE TO BE REMOVED AS NEEDED TO ACCOMMODATE THE PROPOSED DRAINAGE SWALES.
3. ALL EXISTING SURFACE FEATURES EXISTING UTILITIES IN THE UNDISTURBED AREA ARE TO REMAIN UNLESS OTHERWISE NOTED.

LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS
- PROPOSED CONTOURS
- EXISTING WATER LINE
- EXISTING STORM MAIN
- EXISTING SANITARY SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING OVERHEAD ELECTRIC
- EXISTING UNDERGROUND TELECOM
- PROPOSED WATER
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- CHECK DAM
- CONSTRUCTION FENCE
- COFFERDAM
- CULVERT PROTECTION
- CONSTRUCTION TRAILER
- CONCRETE WASHOUT AREA
- INLET PROTECTION
- LIMITS OF CONSTRUCTION
- OUTLET PROTECTION
- ROUGH CUT STREET CONTROL
- ROCK SOCK
- SEDIMENT CONTROL LOG
- SILT FENCE
- SEEDING AND MULCHING
- SOIL STOCKPILE
- SURFACE ROUGHENGING
- STABILIZED STAGING AREA
- VEHICLE TRACKING CONTROL
- TEMPORARY STREAM CROSSING
- EXISTING STORM SEWER
- UNDISTURBED AREA
- RUNOFF ARROWS
- AREA OF DRAINAGE DISTURBANCE

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40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

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Denver, Colorado 80203
P: 303.623.6300 F: 303.623.6311
HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INTERIM - R4 C5

ISSUE DATE: 11-15-2019	PROJECT #: 190108
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 49
ES - 49 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - INTERIM - 3.DWG LAYOUT: NAVAJATNY - R4 C5
11 XREFs: client logo, c-base, c-sign, c-util, key map, p-base-f1, p-base-f2[3], p-sign-f1, p-util-f1, stamp - swmp, swmp - intial
PLOTTED: THU 04/01/21 10:54:52A BY: TIM SAVLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

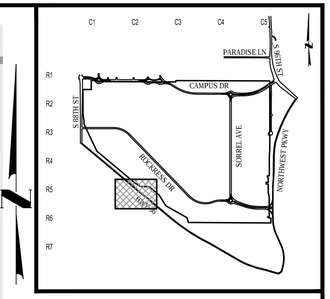
MATCHLINE - SEE SHEET ES - 46

LOT 2 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

EX FENCE (TO REMAIN TYP)
PROPERTY BOUNDARY
EX CHANNEL (TO REMAIN TYP)
EX MH (TO REMAIN)
EX POST (TO REMAIN TYP)
EX 20' PSCO EASEMENT REC. NO. 0106287 (TO BE VACATED)
EX DIRT TRAIL (TO REMAIN)
EX 10' IRRIGATION EASEMENT REC. NO. 3048888 (TO BE VACATED)
EX STREET LIGHT (TO REMAIN TYP)
HIGHWAY 36
VARIABLE WIDTH ROW
PROPERTY BOUNDARY
PROPERTY BOUNDARY

5435 5430 5425 5420 5415 5480 5475 5485 5470 5465 5460 5455 5450 5440

MATCHLINE - SEE SHEET ES - 51



KEY MAP
1"=2000'

NOTES:

1. ALL EXISTING SURFACE FEATURES NOT INCLUDED WITHIN FILING NO. 1 ARE TO REMAIN UNLESS OTHERWISE NOTED. SEE SHEETS MASTER UTILITY AND SURFACE IMPROVEMENTS PLAN FOR PHASING.
2. EXISTING SURFACE FEATURES ARE TO BE REMOVED AS NEEDED TO ACCOMMODATE THE PROPOSED DRAINAGE SWALES.
3. ALL EXISTING SURFACE FEATURES EXISTING UTILITIES IN THE UNDISTURBED AREA ARE TO REMAIN UNLESS OTHERWISE NOTED.

LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS (5264 / 5265)
- PROPOSED CONTOURS (5264 / 5265)
- EXISTING WATER LINE (W)
- EXISTING STORM MAIN (ST)
- EXISTING SANITARY SEWER (SS)
- EXISTING UNDERGROUND ELECTRIC (UE)
- EXISTING OVERHEAD ELECTRIC (OE)
- EXISTING UNDERGROUND TELECOM (UT)
- PROPOSED WATER (W)
- PROPOSED STORM SEWER (ST)
- PROPOSED SANITARY SEWER (SS)
- CHECK DAM (CD)
- CONSTRUCTION FENCE (CF)
- COFFERDAM (CFD)
- CULVERT PROTECTION (CP)
- CONSTRUCTION TRAILER (CT)
- CONCRETE WASHOUT AREA (CWA)
- INLET PROTECTION (IP)
- LIMITS OF CONSTRUCTION (LOC)
- OUTLET PROTECTION (OP)
- ROUGH CUT STREET CONTROL (RCS)
- ROCK SOCK (RS)
- SEDIMENT CONTROL LOG (SCL)
- SILT FENCE (SF)
- SEEDING AND MULCHING (SM)
- SOIL STOCKPILE (SP)
- SURFACE ROUGHENGING (SR)
- STABILIZED STAGING AREA (SSA)
- VEHICLE TRACKING CONTROL (VTC)
- TEMPORARY STREAM CROSSING (TSC)
- EXISTING STORM SEWER
- UNDISTURBED AREA
- RUNOFF ARROWS
- AREA OF DRAINAGE DISTURBANCE

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40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

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Denver, Colorado 80203
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HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INTERIM - R5 C2

ISSUE DATE: 11-15-2019	PROJECT #: 190108
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 50
ES - 50 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP_INTERIM_2.DWG LAYOUT: NAVATNY_R5 C2
11 XREFs: client logo, e-base, e-legal, e-util, key map, p-base-f1, p-base-f2(1), p-legal-f1, p-util-f1, stamp, swmp, swmp - initial
PLOTTED: THU 04/01/21 05:56:07A BY: TIM SAVLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 47

MATCHLINE - SEE SHEET ES - 50

MATCHLINE - SEE SHEET ES - 52

MATCHLINE - SEE SHEET ES - 54

EX OVERHEAD ELECTRIC (TO REMAIN TYP)

EX 75' PSCO EASEMENT BK. 725 PG. 77 (TO REMAIN)

EX ELECTRIC POLE (TO REMAIN TYP)

EX DIRT TRAIL (TO REMAIN)

LOT 2 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

SILT FENCE (TO BE REMOVED AFTER CONSTRUCTION TYP)

PR WAT MAIN

LOT 2 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

EX POST (TO REMAIN TYP)

PROPERTY BOUNDARY

EX FENCE (TO REMAIN TYP)

EX 10' IRRIGATION EASEMENT REC. NO. 3048888 (TO BE VACATED)

EX SECTION LINE

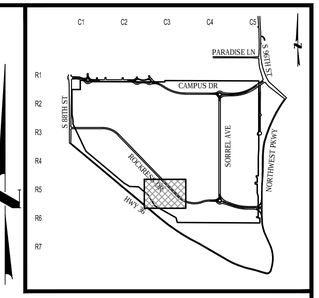
LIMITS OF CONSTRUCTION AND SILT FENCE (TYP)

EX 10' IRRIGATION EASEMENT REC. NO. 3048888 (TO BE VACATED)

EX STREET LIGHT (TO REMAIN)

HIGHWAY 36
VARIABLE WIDTH ROW

EX UTILITY MH (TO REMAIN TYP)



KEY MAP
1"=2000'

NOTES:

1. ALL EXISTING SURFACE FEATURES NOT INCLUDED WITHIN FILING NO. 1 ARE TO REMAIN UNLESS OTHERWISE NOTED. SEE SHEETS MASTER UTILITY AND SURFACE IMPROVEMENTS PLAN FOR PHASING.
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LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS
- PROPOSED CONTOURS
- EXISTING WATER LINE
- EXISTING STORM MAIN
- EXISTING SANITARY SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING OVERHEAD ELECTRIC
- EXISTING UNDERGROUND TELECOM
- PROPOSED WATER
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- CD — CHECK DAM
- CF — CONSTRUCTION FENCE
- CFD — COFFERDAM
- CIP — CULVERT PROTECTION
- CT — CONSTRUCTION TRAILER
- CWA — CONCRETE WASHOUT AREA
- IP — INLET PROTECTION
- LOC — LIMITS OF CONSTRUCTION
- OP — OUTLET PROTECTION
- RCS — ROUGH CUT STREET CONTROL
- RS — ROCK SOCK
- SCL — SEDIMENT CONTROL LOG
- SF — SILT FENCE
- SM — SEEDING AND MULCHING
- SP — SOIL STOCKPILE
- SR — SURFACE ROUGHENGING
- SSA — STABILIZED STAGING AREA
- VTC — VEHICLE TRACKING CONTROL
- TSC — TEMPORARY STREAM CROSSING
- EXISTING STORM SEWER
- UNDISTURBED AREA
- RUNOFF ARROWS
- AREA OF DRAINAGE DISTURBANCE

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CALL 3 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

HARRIS KOCHER SMITH
1120 Lincoln Street, Suite 1000
Denver, Colorado 80203
P: 303.623.6300 F: 303.623.6311
HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INTERIM - R5 C3

ISSUE DATE: 11-15-2019 | PROJECT #: 190108

DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 51
ES - 51 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - INTERIM - 4.DWG LAYOUT: NAWATNY - R5 C3
11 XREFS: client topo, e-base, e-sign, e-util, key map, p-base-f1, p-base-f2[1], p-sign-f1, p-util-f1, stamp - swmp, swmp - initial
PLOTTED: THU 04/01/21 10:55:50A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 48

MATCHLINE - SEE SHEET ES - 51

MATCHLINE - SEE SHEET ES - 53

MATCHLINE - SEE SHEET ES - 55

LOT 1 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

LOT 1 BLOCK 2
REDTAIL RIDGE SUBDIVISION
FILING NO 1

LOT 2 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

LOT 3 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

TRACT F
REDTAIL RIDGE SUBDIVISION
FILING NO 1

SORREL AVE
(120' ROW)

ROCKCRESS DR
(120' ROW)

EX UNDERGROUND TELECOM (TO REMAIN TYP)

EX UNDERGROUND ELECTRIC (TO REMAIN TYP)

EX POST (TO REMAIN TYP)

EX ELECTRIC MH (TO REMAIN TYP)

EX FENCE (TO REMAIN TYP)

EX TRANSFORMER (TO REMAIN TYP)

EX MH (TO REMAIN TYP)

EX 50' PSCO EASEMENT REC. NO. 543534 (TO REMAIN)

EX 10' IRRIGATION EASEMENT REC. NO. 3048888 (TO BE VACATED)

EX 40' PSCO EASEMENT REC. NO. 0710884 (TO REMAIN)

EX ELECTRIC MANHOLE (TO BE REMOVED TYP)

EX TELECOM RISER (TO REMAIN TYP)

EX PROPERTY BOUNDARY REC. NO. 531604 (TO REMAIN)

EX BLDG (TO REMAIN)

EX LIGHT (TO BE REMOVED)

PR WAT MAIN (TYP)

PR SS MAIN (TYP)

PR STREET LIGHT (TYP)

PR STM INLET (TYP)

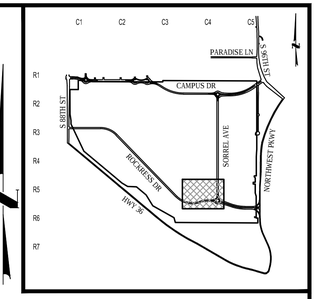
PR STM MH (TYP)

PR SS MH (TYP)

SILT FENCE (TO BE REMOVED AFTER CONSTRUCTION TYP)

ROCK SOCK (TO BE REMOVED AFTER CONSTRUCTION TYP)

INLET PROTECTION (TO BE REMOVED AFTER CONSTRUCTION TYP)



KEY MAP
1"=2000'

NOTES:

1. ALL EXISTING SURFACE FEATURES NOT INCLUDED WITHIN FILING NO. 1 ARE TO REMAIN UNLESS OTHERWISE NOTED. SEE SHEETS MASTER UTILITY AND SURFACE IMPROVEMENTS PLAN FOR PHASING.
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3. ALL EXISTING SURFACE FEATURES EXISTING UTILITIES IN THE UNDISTURBED AREA ARE TO REMAIN UNLESS OTHERWISE NOTED.

LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS
- PROPOSED CONTOURS
- EXISTING WATER LINE
- EXISTING STORM MAIN
- EXISTING SANITARY SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING OVERHEAD ELECTRIC
- EXISTING UNDERGROUND TELECOM
- PROPOSED WATER
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- CD — CHECK DAM
- CF — CONSTRUCTION FENCE
- CFD — COFFERDAM
- CVP — CULVERT PROTECTION
- CT — CONSTRUCTION TRAILER
- CWA — CONCRETE WASHOUT AREA
- IP — INLET PROTECTION
- LOC — LIMITS OF CONSTRUCTION
- OP — OUTLET PROTECTION
- RCS — ROUGH CUT STREET CONTROL
- RS — ROCK SOCK
- SCL — SEDIMENT CONTROL LOG
- SF — SILT FENCE
- SM — SEEDING AND MULCHING
- SP — SOIL STOCKPILE
- SR — SURFACE ROUGHENGING
- SSA — STABILIZED STAGING AREA
- VTC — VEHICLE TRACKING CONTROL
- TSC — TEMPORARY STREAM CROSSING
- EXISTING STORM SEWER
- UNDISTURBED AREA
- RUNOFF ARROWS
- AREA OF DRAINAGE DISTURBANCE

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40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

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Denver, Colorado 80203
P: 303.623.6300 F: 303.623.6311
HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INTERIM - R5 C4

ISSUE DATE: 11-15-2019	PROJECT #: 190108
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 52
ES - 52 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP_INTERIM_4.DWG LAYOUT: NAVIATNV_R5 C4
11 XREFs: client logo, c-base, e-topi, e-util, key map, p-base-t2[1], p-topi-t1, p-util-1, p-base-t1, p-base-t1, p-util-1, stamp - swmp, swmp - intial
PLOTTED: THU 04/01/21 10:56:08A BY: TIM SAYLER

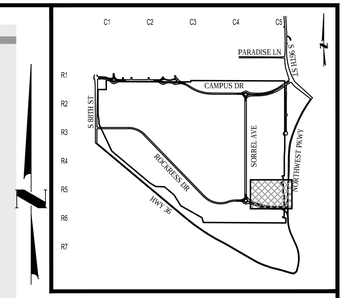
NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 49

MATCHLINE - SEE SHEET ES - 52

EX MH (TO REMAIN TYP)
EX ASPHALT PARKING LOT (TO REMAIN)
EX DIRT TRAIL (TO REMAIN TYP)
EX POST (TO REMAIN TYP)
EX CULVERT PIPE (TO REMAIN TYP)
EX FENCE (TO REMAIN TYP)
EX 30' PSCO EASEMENT REC. NO. 531606 (TO REMAIN)
PR SS FORCE MAIN (TYP)
SILT FENCE (TO BE REMOVED AFTER CONSTRUCTION TYP)
ROCK SOCK (TO BE REMOVED AFTER CONSTRUCTION TYP)
PR WAT MAIN (TYP)
LIMITS OF CONSTRUCTION AND SILT FENCE (TYP)
LOT 1 BLOCK 2 REDTAIL RIDGE SUBDIVISION FILING NO 1
TRACT E REDTAIL RIDGE SUBIVISION FILING NO 1
PR 10' UTILITY ESMT
PR 30' UTILITY ESMT
CULVERT PROTECTION (TO BE REMOVED AFTER CONSTRUCTION)
NORTHWEST PKWY
VARIABLE WIDTH ROW
TRAILER BATHROOM (TO BE REMOVED AFTER CONSTRUCTION)
CONSTRUCTION TRAILER (TO BE REMOVED AFTER CONSTRUCTION)
STOCK PILE AREA AND SILT FENCE (TO BE REMOVED AFTER CONSTRUCTION)
PR LOT LINE (TYP)
PR 12' SW
INLET PROTECTION (TO BE REMOVED AFTER CONSTRUCTION TYP)
EX 10' IRRIGATION EASEMENT REC. NO. 3048888 (TO BE VACATED)
STABILIZED STAGING AREA (TO BE REMOVED AFTER CONSTRUCTION)
PR FH (TYP)
PR STM MAIN (TYP)
CONCRETE WASHOUT AREA (TO BE REMOVED AFTER CONSTRUCTION)
EX STM (TO REMAIN TYP)
PR STREET LIGHT (TYP)
PR SS MAIN (TYP)
PR 120' ROW
ROCKCRESS DR (120' ROW)
PR STM MH (TYP)
PR SS MH (TYP)
PR LANDSCAPE ESMT (VARIABLE WIDTH)
PR 30' UTILITY ESMT
PR STM INLET (TYP)
PR FIRE HYDRANT (TYP)
PR 10' DRY UTILITY ESMT
VEHICLE TRAFFIC CONTROL, SEDIMENT CONTROL LOG, AND CONSTRUCTION FENCE (TO BE REMOVED AFTER CONSTRUCTION)

MATCHLINE - SEE SHEET ES - 56



KEY MAP
1"=2000'

NOTES:

1. ALL EXISTING SURFACE FEATURES NOT INCLUDED WITHIN FILING NO. 1 ARE TO REMAIN UNLESS OTHERWISE NOTED. SEE SHEETS MASTER UTILITY AND SURFACE IMPROVEMENTS PLAN FOR PHASING.
2. EXISTING SURFACE FEATURES ARE TO BE REMOVED AS NEEDED TO ACCOMMODATE THE PROPOSED DRAINAGE SWALES.
3. ALL EXISTING SURFACE FEATURES EXISTING UTILITIES IN THE UNDISTURBED AREA ARE TO REMAIN UNLESS OTHERWISE NOTED.

LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS
- PROPOSED CONTOURS
- EXISTING WATER LINE
- EXISTING STORM MAIN
- EXISTING SANITARY SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING OVERHEAD ELECTRIC
- EXISTING UNDERGROUND TELECOM
- PROPOSED WATER
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- CD — CHECK DAM
- CF — CONSTRUCTION FENCE
- CFD — COFFERDAM
- CBP — CULVERT PROTECTION
- CT — CONSTRUCTION TRAILER
- CWA — CONCRETE WASHOUT AREA
- IP — INLET PROTECTION
- LOC — LIMITS OF CONSTRUCTION
- OP — OUTLET PROTECTION
- RCS — ROUGH CUT STREET CONTROL
- RS — ROCK SOCK
- SCL — SEDIMENT CONTROL LOG
- SF — SILT FENCE
- SM — SEEDING AND MULCHING
- SP — SOIL STOCKPILE
- SR — SURFACE ROUGHENGING
- SSA — STABILIZED STAGING AREA
- VTC — VEHICLE TRACKING CONTROL
- TSC — TEMPORARY STREAM CROSSING
- EXISTING STORM SEWER
- UNDISTURBED AREA
- RUNOFF ARROWS
- AREA OF DRAINAGE DISTURBANCE

811 Know what's below. Call before you dig.
CALL 3 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

HARRIS KOCHER SMITH
1120 Lincoln Street, Suite 1000
Denver, Colorado 80203
P: 303.623.6300 F: 303.623.6311
HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INTERIM - R5 C5

ISSUE DATE: 11-15-2019	PROJECT #: 190108
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

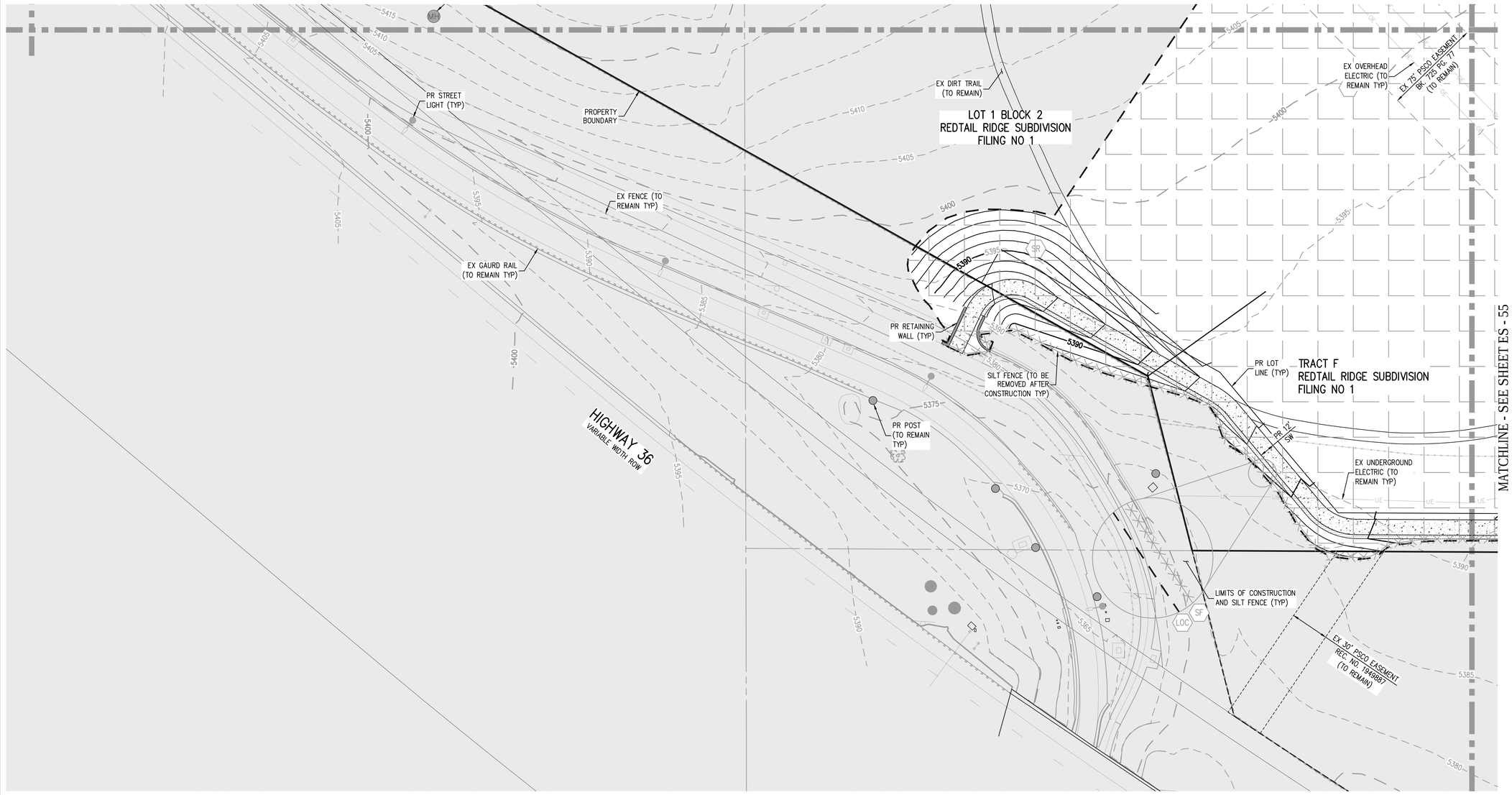
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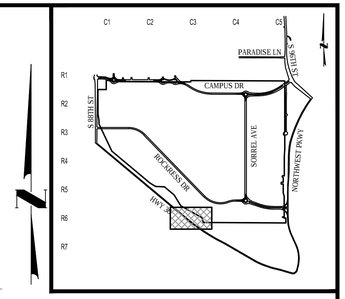
SHEET NO.
ES - 53
ES - 53 OF ES - 91

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11 XREFs: client logo, e-base, e-sigal, e-util, key map, p-base-f2(1), p-sigal-f1, p-sbf-f1, stamp - swmp, swmp - initial
PLOTTED: THU 04/01/21 10:56:23A BY: TIM SNYDER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH.

MATCHLINE - SEE SHEET ES - 51





KEY MAP
1"=2000'

NOTES:

1. ALL EXISTING SURFACE FEATURES NOT INCLUDED WITHIN FILING NO. 1 ARE TO REMAIN UNLESS OTHERWISE NOTED. SEE SHEETS MASTER UTILITY AND SURFACE IMPROVEMENTS PLAN FOR PHASING.
2. EXISTING SURFACE FEATURES ARE TO BE REMOVED AS NEEDED TO ACCOMMODATE THE PROPOSED DRAINAGE SWALES.
3. ALL EXISTING SURFACE FEATURES EXISTING UTILITIES IN THE UNDISTURBED AREA ARE TO REMAIN UNLESS OTHERWISE NOTED.

LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS
- PROPOSED CONTOURS
- EXISTING WATER LINE
- EXISTING STORM MAIN
- EXISTING SANITARY SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING OVERHEAD ELECTRIC
- EXISTING UNDERGROUND TELECOM
- PROPOSED WATER
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- CD — CHECK DAM
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- UNDISTURBED AREA
- RUNOFF ARROWS
- AREA OF DRAINAGE DISTURBANCE

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CALL 3 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

HARRIS KOCHER SMITH
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Denver, Colorado 80203
P: 303.623.6300 F: 303.623.6311
HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INTERIM - R6 C3

ISSUE DATE: 11-15-2019 | PROJECT #: 190108

DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

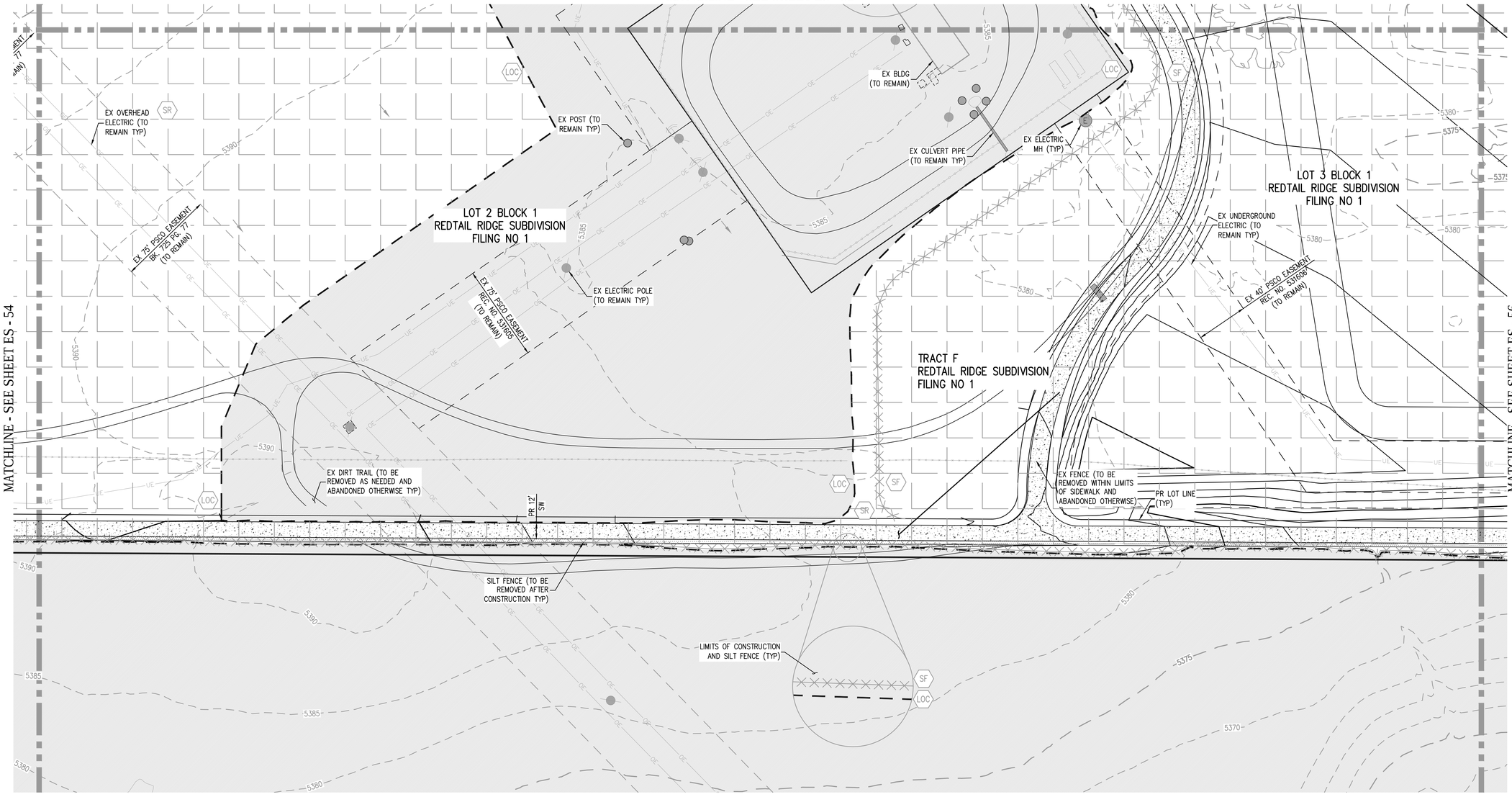
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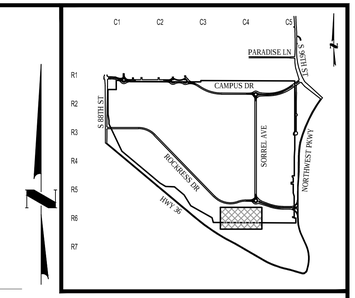
SHEET NO.
ES - 54
ES - 54 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - INTERIM - 4.DWG LAYOUT: NAVATNY - R6 C2
11 XREFs: cover logo, e-base, e-legal, e-util, key map, p-base-1, p-base-2[2], p-legal-1, p-util-1, xsamp - xswmp, xswmp - initial
PLOTTED: THU 04/01/21 10:56:42A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH.

MATCHLINE - SEE SHEET ES - 52





KEY MAP
1"=2000'

NOTES:

1. ALL EXISTING SURFACE FEATURES NOT INCLUDED WITHIN FILING NO. 1 ARE TO REMAIN UNLESS OTHERWISE NOTED. SEE SHEETS MASTER UTILITY AND SURFACE IMPROVEMENTS PLAN FOR PHASING.
2. EXISTING SURFACE FEATURES ARE TO BE REMOVED AS NEEDED TO ACCOMMODATE THE PROPOSED DRAINAGE SWALES.
3. ALL EXISTING SURFACE FEATURES EXISTING UTILITIES IN THE UNDISTURBED AREA ARE TO REMAIN UNLESS OTHERWISE NOTED.

LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS
- PROPOSED CONTOURS
- EXISTING WATER LINE
- EXISTING STORM MAIN
- EXISTING SANITARY SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING OVERHEAD ELECTRIC
- EXISTING UNDERGROUND TELECOM
- PROPOSED WATER
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- CHECK DAM
- CONSTRUCTION FENCE
- COFFERDAM
- CULVERT PROTECTION
- CONSTRUCTION TRAILER
- CONCRETE WASHOUT AREA
- INLET PROTECTION
- LIMITS OF CONSTRUCTION
- OUTLET PROTECTION
- ROUGH CUT STREET CONTROL
- ROCK SOCK
- SEDIMENT CONTROL LOG
- SILT FENCE
- SEEDING AND MULCHING
- SOIL STOCKPILE
- SURFACE ROUGHENGING
- STABILIZED STAGING AREA
- VEHICLE TRACKING CONTROL
- TEMPORARY STREAM CROSSING
- EXISTING STORM SEWER
- UNDISTURBED AREA
- RUNOFF ARROWS
- AREA OF DRAINAGE DISTURBANCE

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40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

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HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INTERIM - R6 C4

ISSUE DATE: 11-15-2019 | PROJECT #: 190108

DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 55
ES - 55 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - INTERIM - 4.DWG LAYOUT: NAWATNY - R6 C4
11 XREFS: client logo, e-base, e-legal, e-cell, key map, pBase-f1, p-leg-f1, p-ut-f1, stamp - swmp, swmp - initial
PLOTTED: TBI 04/01/21 10:56:57A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 53

MATCHLINE - SEE SHEET ES - 55

MATCHLINE - SEE SHEET ES - 57

ROCKCRESS DR
(120' ROW)

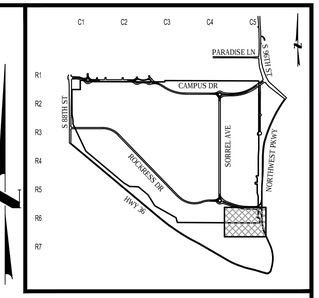
NORTHWEST PKWY
VARIABLE WIDTH ROW

LOT 3 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

TRACT F
REDTAIL RIDGE SUBDIVISION
FILING NO 1

LOT 4 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

PR SS MH (TYP)
PR STREET LIGHT (TYP)
PR STM INLET (TYP)
PR LANDSCAPE ESMT (VARIABLE WIDTH)
EX DIRT TRAIL (TO REMAIN TYP)
ROCK SOCK (TO BE REMOVED AFTER CONSTRUCTION TYP)
PR 33' UTILITY ESMT
EX 30' PSCO EASEMENT REC. NO. 531606 (TO REMAIN)
INLET PROTECTION (TO BE REMOVED AFTER CONSTRUCTION TYP)
SILT FENCE (TO BE REMOVED AFTER CONSTRUCTION TYP)
PR 14' SW
PR LIFT STATION
EX 40' PSCO EASEMENT REC. NO. 531606 (TO REMAIN)
EX UNDERGROUND ELECTRIC (TO REMAIN TYP)
EX ELECTRIC MH (TO REMAIN)
EX FENCE (TO REMAIN TYP)
PR LOT LINE (TYP)
PR 12' SW
PR TRANSFORMER (TYP)
EX DIRT TRAIL (TO BE REMOVED AS NEEDED AND ABANDONED OTHERWISE TYP)
EX SIGN (TO REMAIN TYP)
EX POST (TO REMAIN TYP)
LIMITS OF CONSTRUCTION AND SILT FENCE (TYP)



KEY MAP
1"=2000'

NOTES:

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LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS (5264 / 5265)
- PROPOSED CONTOURS (5264 / 5265)
- EXISTING WATER LINE (W)
- EXISTING STORM MAIN (ST)
- EXISTING SANITARY SEWER (SS)
- EXISTING UNDERGROUND ELECTRIC (UE / E)
- EXISTING OVERHEAD ELECTRIC (OE)
- EXISTING UNDERGROUND TELECOM (UT)
- PROPOSED WATER (W)
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER (SS)
- CHECK DAM (CD)
- CONSTRUCTION FENCE (CF)
- COFFERDAM (CFD)
- CULVERT PROTECTION (CP)
- CONSTRUCTION TRAILER (CT)
- CONCRETE WASHOUT AREA (CWA)
- INLET PROTECTION (IP)
- LIMITS OF CONSTRUCTION (LOC)
- OUTLET PROTECTION (OP)
- ROUGH CUT STREET CONTROL (RCS)
- ROCK SOCK (RS)
- SEDIMENT CONTROL LOG (SCL)
- SILT FENCE (SF)
- SEEDING AND MULCHING (SM)
- SOIL STOCKPILE (SP)
- SURFACE ROUGHENGING (SR)
- STABILIZED STAGING AREA (SSA)
- VEHICLE TRACKING CONTROL (VTC)
- TEMPORARY STREAM CROSSING (TSC)
- EXISTING STORM SEWER
- UNDISTURBED AREA
- RUNOFF ARROWS
- AREA OF DRAINAGE DISTURBANCE

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CALL 3 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

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Denver, Colorado 80203
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HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INTERIM - R6 C5

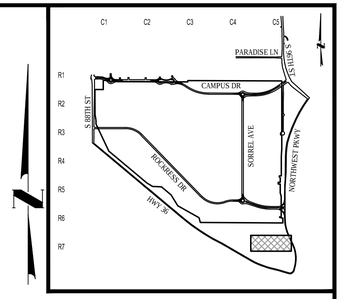
ISSUE DATE: 11-15-2019	PROJECT #: 190108
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 56
ES - 56 OF ES - 91

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11 XREFs: client logo, e-base, e-legal, e-util, key map, p-base-1, p-base-2[1], p-legal-1, p-util-1, sanmp, swmp, swmp - initial
PLOTTED: THU 04/01/21 10:52:12A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH.



KEY MAP

1"=2000'

MATCHLINE - SEE SHEET ES - 56



NOTES:

1. ALL EXISTING SURFACE FEATURES NOT INCLUDED WITHIN FILING NO. 1 ARE TO REMAIN UNLESS OTHERWISE NOTED. SEE SHEETS MASTER UTILITY AND SURFACE IMPROVEMENTS PLAN FOR PHASING.
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3. ALL EXISTING SURFACE FEATURES EXISTING UTILITIES IN THE UNDISTURBED AREA ARE TO REMAIN UNLESS OTHERWISE NOTED.

LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS (5264 / 5265)
- PROPOSED CONTOURS (5264 / 5265)
- EXISTING WATER LINE (W)
- EXISTING STORM MAIN (ST)
- EXISTING SANITARY SEWER (SS)
- EXISTING UNDERGROUND ELECTRIC (UE)
- EXISTING OVERHEAD ELECTRIC (OE)
- EXISTING UNDERGROUND TELECOM (UT)
- PROPOSED WATER (W)
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER (SS)
- CHECK DAM (CD)
- CONSTRUCTION FENCE (CF)
- COFFERDAM (CFD)
- CULVERT PROTECTION (CP)
- CONSTRUCTION TRAILER (CT)
- CONCRETE WASHOUT AREA (CWA)
- INLET PROTECTION (IP)
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- ROUGH CUT STREET CONTROL (RCS)
- ROCK SOCK (RS)
- SEDIMENT CONTROL LOG (SCL)
- SILT FENCE (SF)
- SEEDING AND MULCHING (SM)
- SOIL STOCKPILE (SP)
- SURFACE ROUGHENGING (SR)
- STABILIZED STAGING AREA (SSA)
- VEHICLE TRACKING CONTROL (VTC)
- TEMPORARY STREAM CROSSING (TSC)
- EXISTING STORM SEWER
- UNDISTURBED AREA
- RUNOFF ARROWS
- AREA OF DRAINAGE DISTURBANCE

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CALL 3 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

40 0 40 80

SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

HARRIS KOCHER SMITH
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Denver, Colorado 80203
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HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - INTERIM - R7 C5

ISSUE DATE: 11-15-2019	PROJECT #: 190108
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

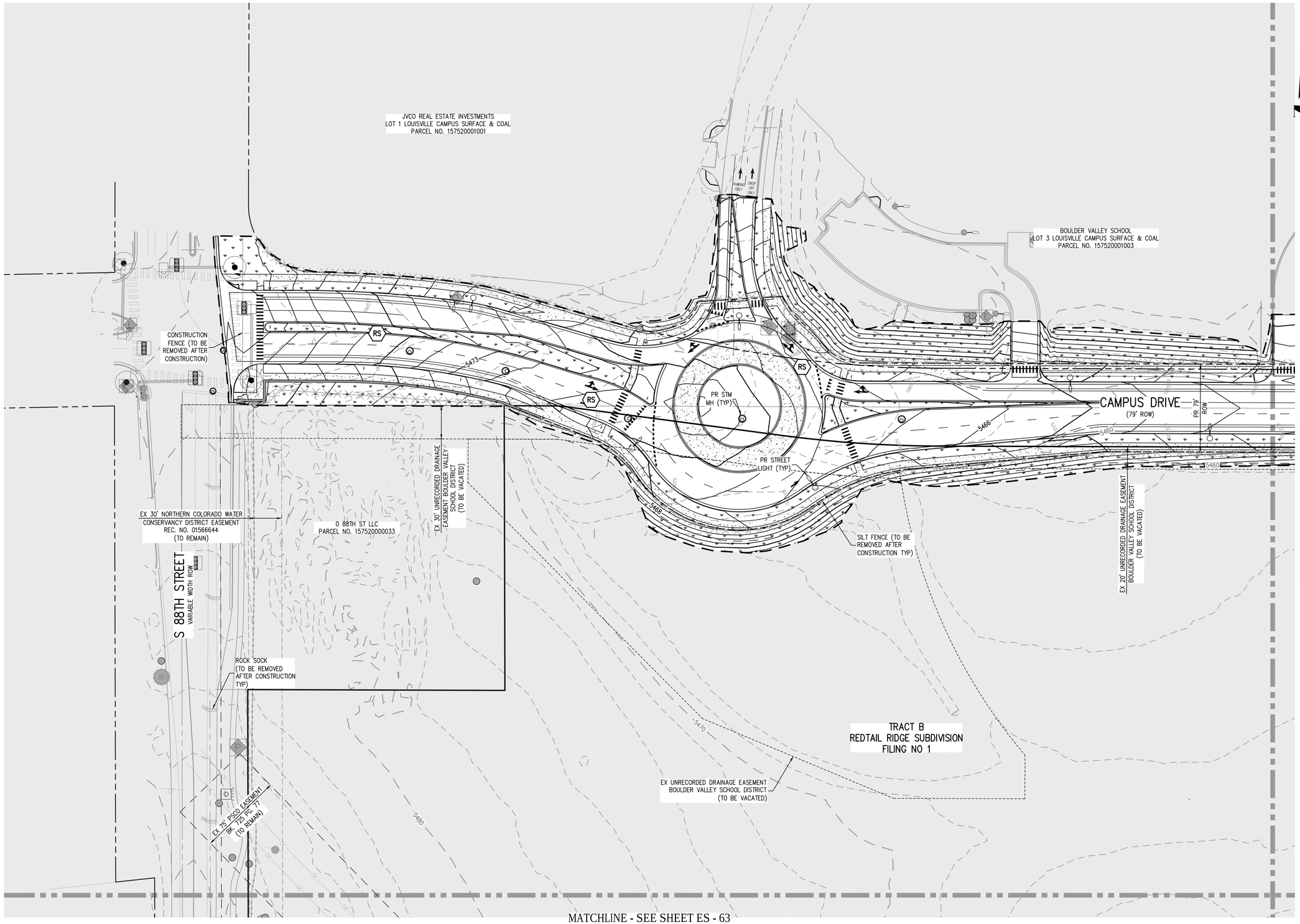
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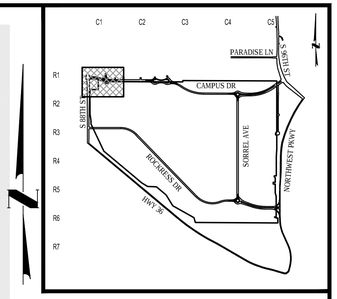
ES - 57

ES - 57 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP_INTERIM_4.DWG LAYOUT: NAVATNY_R7 C5
11 XREFs: client logo, e-base, e-legal, e-util, key map, pBase-f1, pBase-f2 (1), p-legal-f1, samp - swmp, swmp - initial
PLOTTED: TIR| 04/01/21 10:57:28A BY: TIM SAVLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH





KEY MAP
1"=2000'

NOTES:

1. ALL EXISTING SURFACE FEATURES NOT INCLUDED WITHIN FILING NO. 1 ARE TO REMAIN UNLESS OTHERWISE NOTED. SEE SHEETS MASTER UTILITY AND SURFACE IMPROVEMENTS PLAN FOR PHASING.
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3. ALL EXISTING SURFACE FEATURES EXISTING UTILITIES IN THE UNDISTURBED AREA ARE TO REMAIN UNLESS OTHERWISE NOTED.

LEGEND:

- RIGHT-OF-WAY
- 5258 5260 EXISTING CONTOURS
- 5264 5265 PROPOSED CONTOURS
- W EXISTING WATER LINE
- ST EXISTING STORM MAIN
- SS EXISTING SANITARY SEWER
- UE E EXISTING UNDERGROUND ELECTRIC
- UT EXISTING UNDERGROUND TELECOM
- W PROPOSED WATER
- ST PROPOSED STORM SEWER
- SS PROPOSED SANITARY SEWER
- LOC LIMITS OF CONSTRUCTION
- CF CONSTRUCTION FENCE
- SF SILT FENCE
- IP INLET PROTECTION
- CIP CULVERT PROTECTION
- SM SEEDING AND MULCHING
- RS ROCK SOCK
- EXISTING STORM SEWER
- AREA OF DRAINAGE DISTURBANCE
- UNDISTURBED AREA

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40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

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HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - FINAL - R1 C1

ISSUE DATE: 11-15-2019 | PROJECT #: 190108

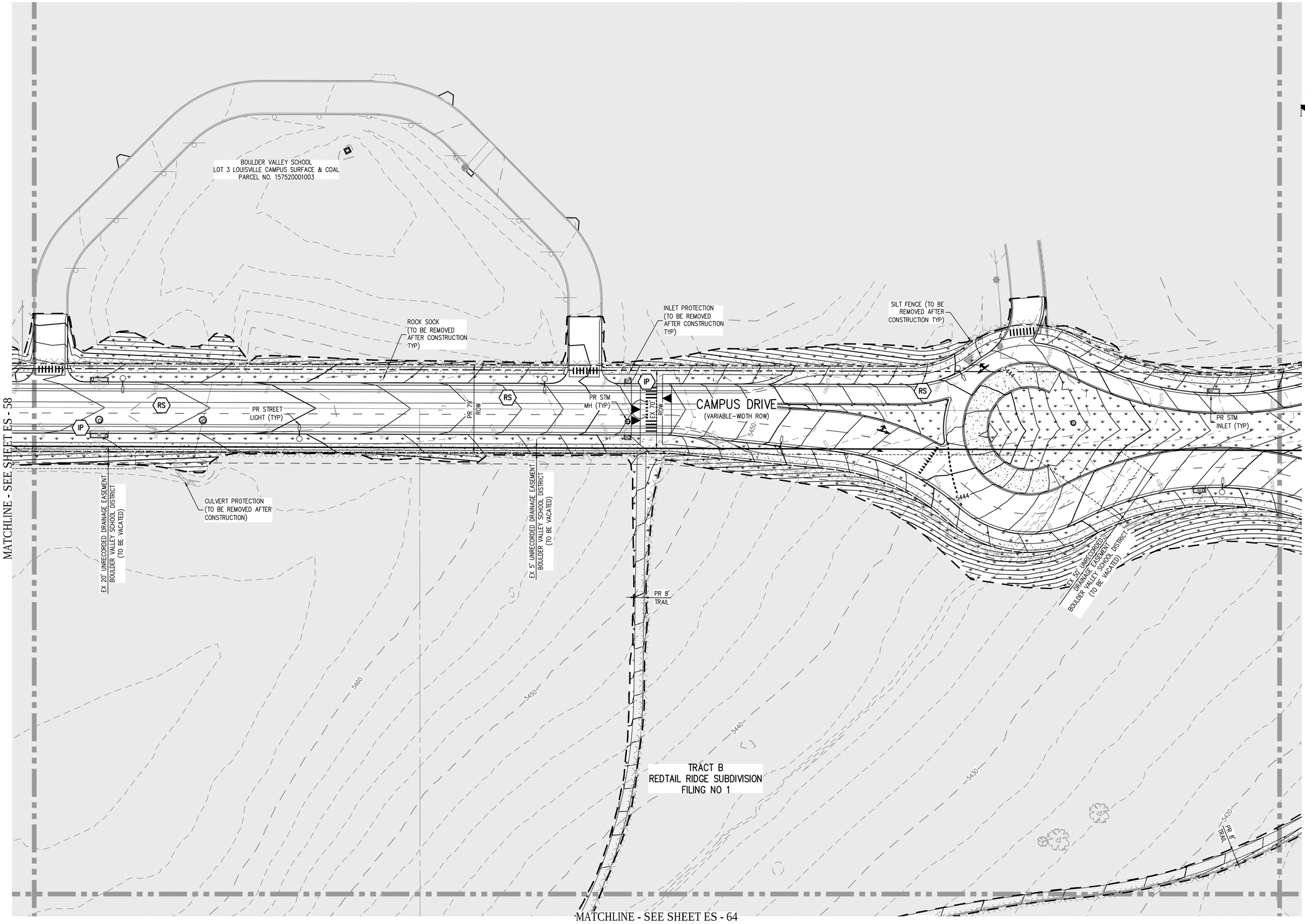
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

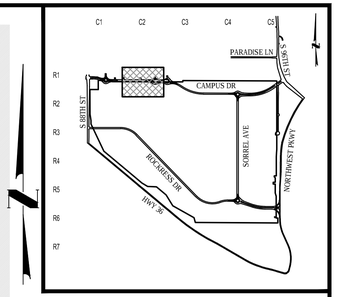
PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 58
ES - 58 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP_FINAL_1.DWG, LAYOUT: NAVATNY_R1 C1
12 XREFs: c-bnd-logo, c-base, c-legal, c-util, key map, p-base-1, p-base-i2(1), p-base-ann-f-1, p-legal-1, p-legal-i2(1), p-util-1, stamp - swmp
PLOTTED: THU 04/01/21 10:58:11A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH.





KEY MAP
1"=2000'

NOTES:

1. ALL EXISTING SURFACE FEATURES NOT INCLUDED WITHIN FILING NO. 1 ARE TO REMAIN UNLESS OTHERWISE NOTED. SEE SHEETS MASTER UTILITY AND SURFACE IMPROVEMENTS PLAN FOR PHASING.
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3. ALL EXISTING SURFACE FEATURES EXISTING UTILITIES IN THE UNDISTURBED AREA ARE TO REMAIN UNLESS OTHERWISE NOTED.

LEGEND:

- RIGHT-OF-WAY
- 5258 / 5260 EXISTING CONTOURS
- 5264 / 5265 PROPOSED CONTOURS
- W EXISTING WATER LINE
- ST EXISTING STORM MAIN
- SS EXISTING SANITARY SEWER
- UE EXISTING UNDERGROUND ELECTRIC
- UT EXISTING UNDERGROUND TELECOM
- W PROPOSED WATER
- ST PROPOSED STORM SEWER
- SS PROPOSED SANITARY SEWER
- LOC LIMITS OF CONSTRUCTION
- CF CONSTRUCTION FENCE
- SF SILT FENCE
- IP INLET PROTECTION
- CIP CULVERT PROTECTION
- SM SEEDING AND MULCHING
- RS ROCK SOCK
- EXISTING STORM SEWER
- AREA OF DRAINAGE DISTURBANCE
- UNDISTURBED AREA

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40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

HARRIS KOCHER SMITH
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Denver, Colorado 80203
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HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - FINAL - R1 C2

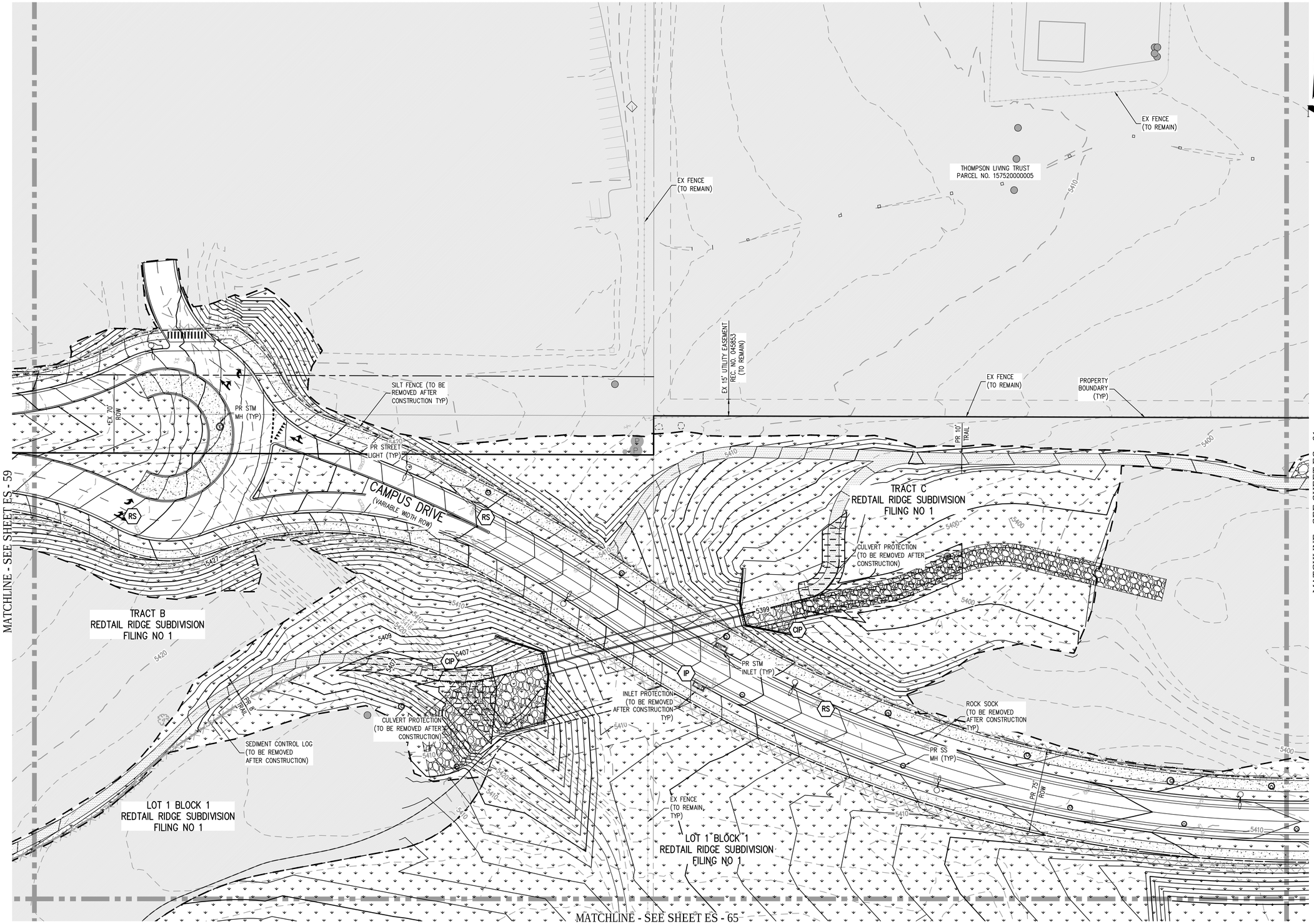
ISSUE DATE: 11-15-2019	PROJECT #: 190108
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

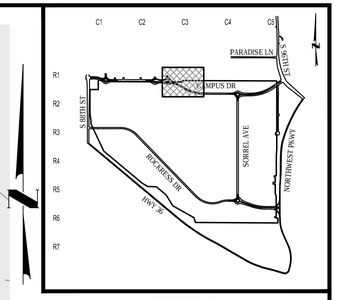
PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 59
ES - 59 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP_FINAL_1.DWG, LAYOUT: NAVATNY - R1 C2
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PLOTTED: THU 04/01/21 10:58:27A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH





KEY MAP
1"=2000'

NOTES:

1. ALL EXISTING SURFACE FEATURES NOT INCLUDED WITHIN FILING NO. 1 ARE TO REMAIN UNLESS OTHERWISE NOTED. SEE SHEETS MASTER UTILITY AND SURFACE IMPROVEMENTS PLAN FOR PHASING.
2. EXISTING SURFACE FEATURES ARE TO BE REMOVED AS NEEDED TO ACCOMMODATE THE PROPOSED DRAINAGE SWALES.
3. ALL EXISTING SURFACE FEATURES EXISTING UTILITIES IN THE UNDISTURBED AREA ARE TO REMAIN UNLESS OTHERWISE NOTED.

LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS (5258 / 5260)
- PROPOSED CONTOURS (5264 / 5265)
- EXISTING WATER LINE (W)
- EXISTING STORM MAIN (ST)
- EXISTING SANITARY SEWER (SS)
- EXISTING UNDERGROUND ELECTRIC (UE)
- EXISTING UNDERGROUND TELECOM (UT)
- PROPOSED WATER (W)
- PROPOSED STORM SEWER (ST)
- PROPOSED SANITARY SEWER (SS)
- LIMITS OF CONSTRUCTION (LOC)
- CONSTRUCTION FENCE (CF)
- SILT FENCE (SF)
- INLET PROTECTION (IP)
- CULVERT PROTECTION (CIP)
- SEEDING AND MULCHING (SM)
- ROCK SOCK (RS)
- EXISTING STORM SEWER
- AREA OF DRAINAGE DISTURBANCE
- UNDISTURBED AREA

811 Know what's below. Call before you dig.

CALL 3 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

HARRIS KOCHER SMITH
1120 Lincoln Street, Suite 1000
Denver, Colorado 80203
P: 303.623.6300 F: 303.623.6311
HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - FINAL - R1 C3

ISSUE DATE: 11-15-2019 | PROJECT #: 190108

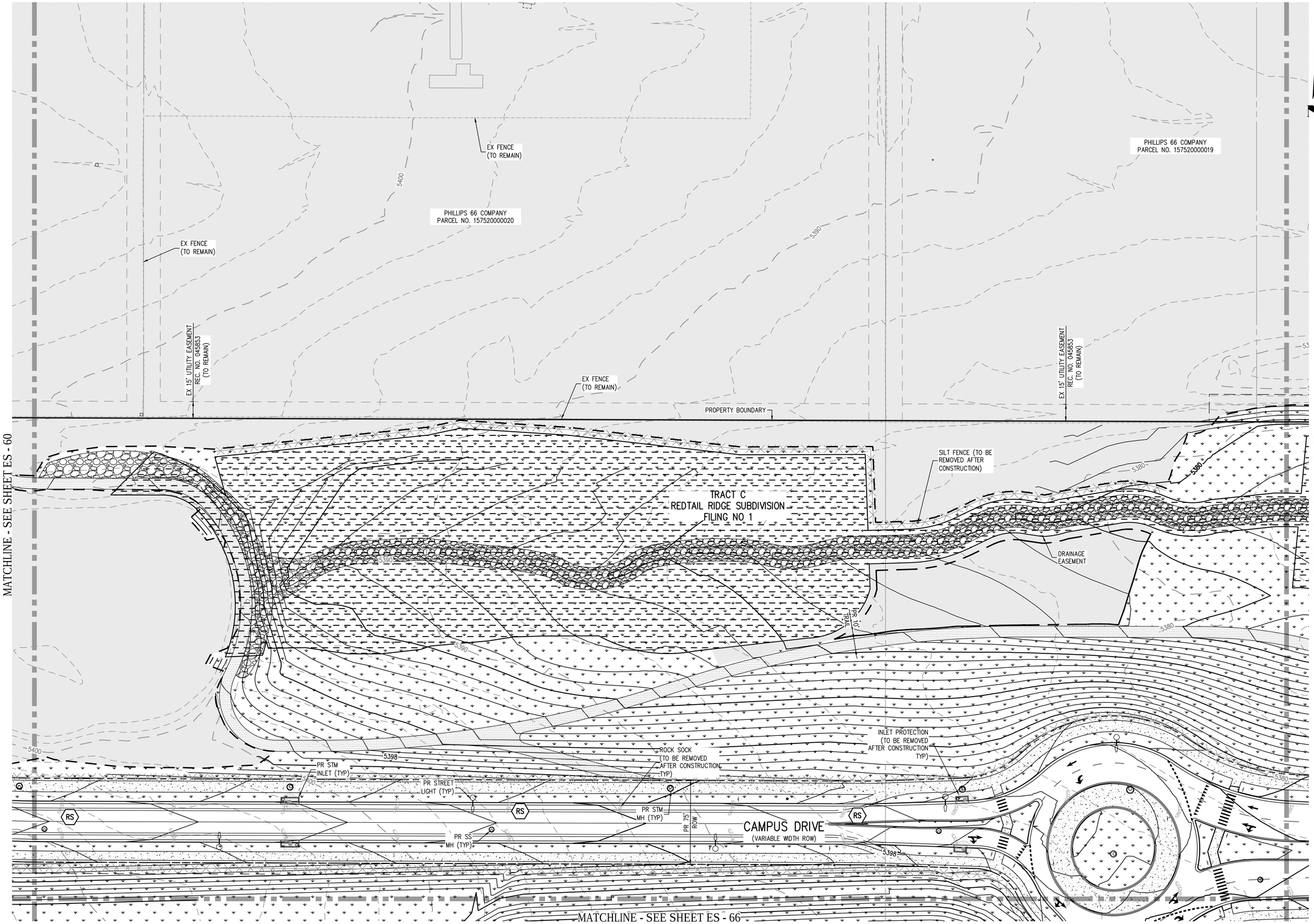
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

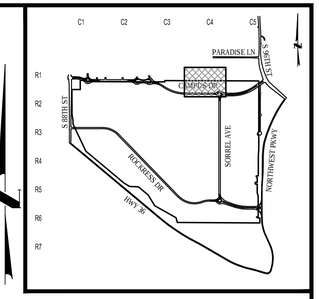
PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 60
ES - 60 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP_FINAL_1.DWG LAYOUT: NAVATNY_R1 C3
12 XREFs: client logo, e-base, e-topo, e-util, key map, p-base-2[1], p-base-3[1], p-base-land-f1, p-legal-1, p-legal-2[1], p-util-f1, stamp - swmp
PLOTTED: THU 04/01/21 10:58:42A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH





KEY MAP
1"=2000'

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1. ALL EXISTING SURFACE FEATURES NOT INCLUDED WITHIN FILING NO. 1 ARE TO REMAIN UNLESS OTHERWISE NOTED. SEE SHEETS MASTER UTILITY AND SURFACE IMPROVEMENTS PLAN FOR PHASING.
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LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS (5258, 5260)
- PROPOSED CONTOURS (5264, 5265)
- EXISTING WATER LINE (W)
- EXISTING STORM MAIN (ST)
- EXISTING SANITARY SEWER (SS)
- EXISTING UNDERGROUND ELECTRIC (UE)
- EXISTING UNDERGROUND TELECOM (UT)
- PROPOSED WATER (W)
- PROPOSED STORM SEWER (ST)
- PROPOSED SANITARY SEWER (SS)
- LIMITS OF CONSTRUCTION (LOC)
- CONSTRUCTION FENCE (CF)
- SILT FENCE (SF)
- INLET PROTECTION (IP)
- CULVERT PROTECTION (CP)
- SEEDING AND MULCHING (SM)
- ROCK SOCK (RS)
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- UNDISTURBED AREA

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40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

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Denver, Colorado 80203
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HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - FINAL - R1 C4

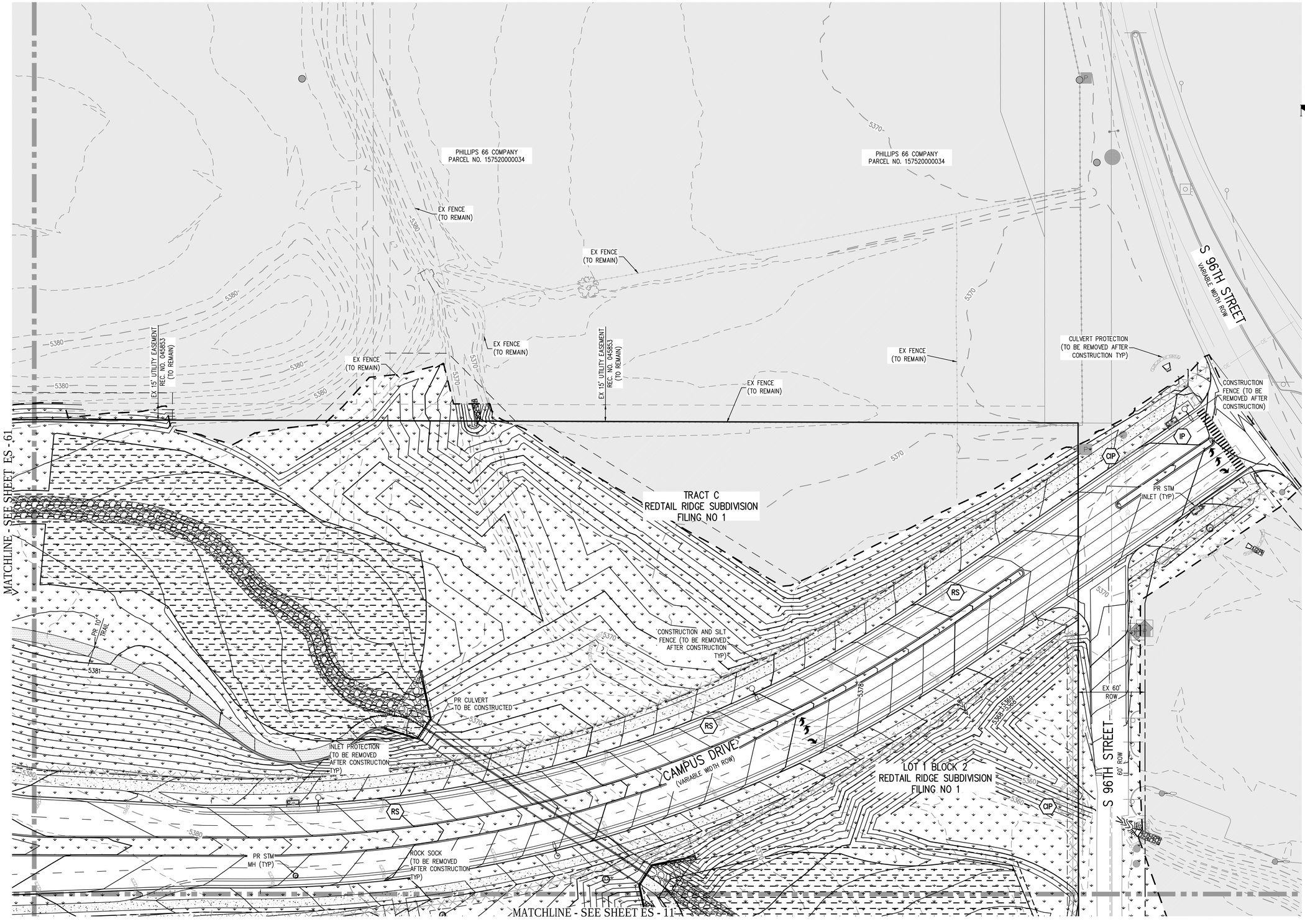
ISSUE DATE: 11-15-2019	PROJECT #: 190108
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

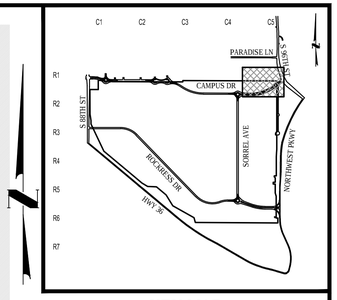
PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 61
ES - 61 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - FINAL - 1.DWG LAYOUT: MAP4TINY - R1 C4
12 XREFs: client logo: e-base, e-sign, e-cul, key map, p-base-f1, p-base-f2(U), p-base-sint-f1, p-legal-f1, p-legal-f2(U), p-util-f1, stamp - swmp
PLOTTED: THU 04/01/21 10:58:57A BY: TIM SAVLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH





KEY MAP
1"=2000'

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LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS (5258 / 5260)
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- EXISTING WATER LINE (W)
- EXISTING STORM MAIN (ST)
- EXISTING SANITARY SEWER (SS)
- EXISTING UNDERGROUND ELECTRIC (UE)
- EXISTING UNDERGROUND TELECOM (UT)
- PROPOSED WATER (W)
- PROPOSED STORM SEWER (ST)
- PROPOSED SANITARY SEWER (SS)
- LIMITS OF CONSTRUCTION (LOC)
- CONSTRUCTION FENCE (CF)
- SILT FENCE (SF)
- INLET PROTECTION (IP)
- CULVERT PROTECTION (CIP)
- SEEDING AND MULCHING (SM)
- ROCK SOCK (RS)
- EXISTING STORM SEWER
- AREA OF DRAINAGE DISTURBANCE
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40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

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Denver, Colorado 80203
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HarrisKocherSmith.com

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REDTAIL RIDGE FILING NO. 1
SWMP - FINAL - R1 C5

ISSUE DATE: 11-15-2019	PROJECT #: 190108
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

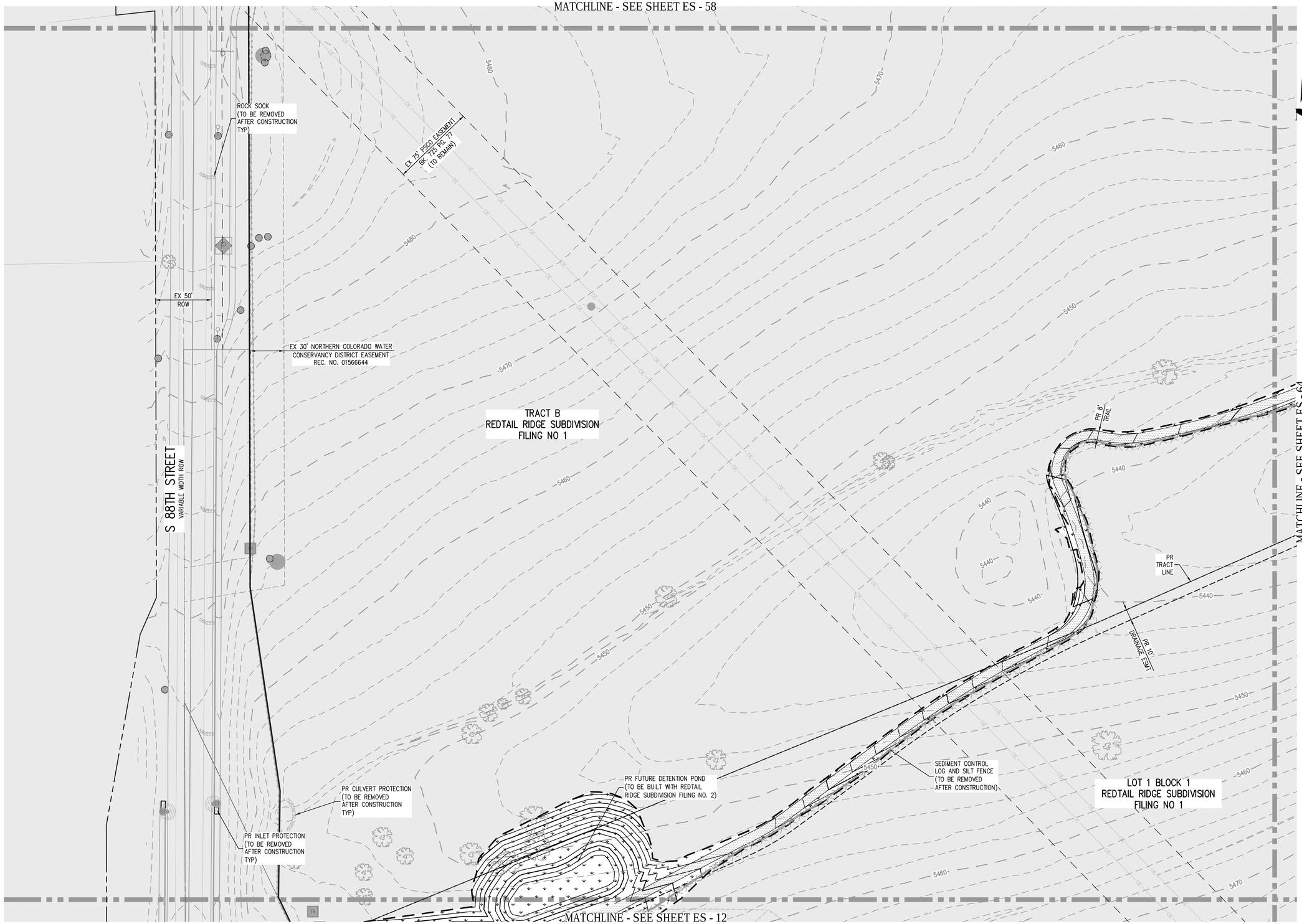
PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 62
ES - 62 OF ES - 91

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PLOTTED: THU 04/01/21 10:59:12A BY: TIM SAYLER

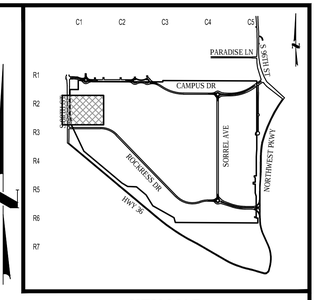
NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 58



MATCHLINE - SEE SHEET ES - 64

MATCHLINE - SEE SHEET ES - 12



KEY MAP
1"=2000'

NOTES:

1. ALL EXISTING SURFACE FEATURES NOT INCLUDED WITHIN FILING NO. 1 ARE TO REMAIN UNLESS OTHERWISE NOTED. SEE SHEETS MASTER UTILITY AND SURFACE IMPROVEMENTS PLAN FOR PHASING.
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LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS (5258, 5260)
- PROPOSED CONTOURS (5264, 5265)
- W — EXISTING WATER LINE
- ST — EXISTING STORM MAIN
- SS — EXISTING SANITARY SEWER
- UE — EXISTING UNDERGROUND ELECTRIC
- UT — EXISTING UNDERGROUND TELECOM
- W — PROPOSED WATER
- ST — PROPOSED STORM SEWER
- SS — PROPOSED SANITARY SEWER
- LOC — LIMITS OF CONSTRUCTION
- CF — CONSTRUCTION FENCE
- SF — SILT FENCE
- IP — INLET PROTECTION
- CIP — CULVERT PROTECTION
- SM — SEEDING AND MULCHING
- RS — ROCK SOCK
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- AREA OF DRAINAGE DISTURBANCE
- UNDISTURBED AREA

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40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

HARRIS KOCHER SMITH
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Denver, Colorado 80203
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HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - FINAL - R2 C1

ISSUE DATE: 11-15-2019 | PROJECT #: 190108

DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 63
ES - 63 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP_FINAL_LDWG LAYOUT: NAVATNY - R2 C1
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PLOTTED: THU 04/01/21 10:59:27A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH.

MATCHLINE - SEE SHEET ES - 59

MATCHLINE - SEE SHEET ES - 63

MATCHLINE - SEE SHEET ES - 65

MATCHLINE - SEE SHEET ES - 69

TRACT B
REDTAIL RIDGE SUBDIVISION
FILING NO 1

PR 8' TRAIL

SEDIMENT CONTROL LOG AND SILT FENCE (TO BE REMOVED AFTER CONSTRUCTION)

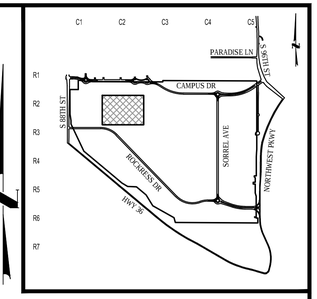
PR TRACT LINE

PR VARIABLE WIDTH DRAINAGE ESMT

EX SECTION LINE

LOT 1 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

5460 5450 5440 5430 5420 5470



KEY MAP
1"=2000'

NOTES:

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LEGEND:

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- EXISTING CONTOURS (5258 / 5260)
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- EXISTING WATER LINE (W)
- EXISTING STORM MAIN (ST)
- EXISTING SANITARY SEWER (SS)
- EXISTING UNDERGROUND ELECTRIC (UE)
- EXISTING UNDERGROUND TELECOM (UT)
- PROPOSED WATER (W)
- PROPOSED STORM SEWER (ST)
- PROPOSED SANITARY SEWER (SS)
- LIMITS OF CONSTRUCTION (LOC)
- CONSTRUCTION FENCE (CF)
- SILT FENCE (SF)
- INLET PROTECTION (IP)
- CULVERT PROTECTION (CVP)
- SEEDING AND MULCHING (SM)
- ROCK SOCK (RS)
- EXISTING STORM SEWER
- AREA OF DRAINAGE DISTURBANCE
- UNDISTURBED AREA

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40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

HARRIS KOCHER SMITH
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Denver, Colorado 80203
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HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - FINAL - R2 C2

ISSUE DATE: 11-15-2019	PROJECT #: 190108
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 64
ES - 64 OF ES - 91

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PLOTTED: TIR(04/01/21 10:59:43A BY: TIM.SAVLER

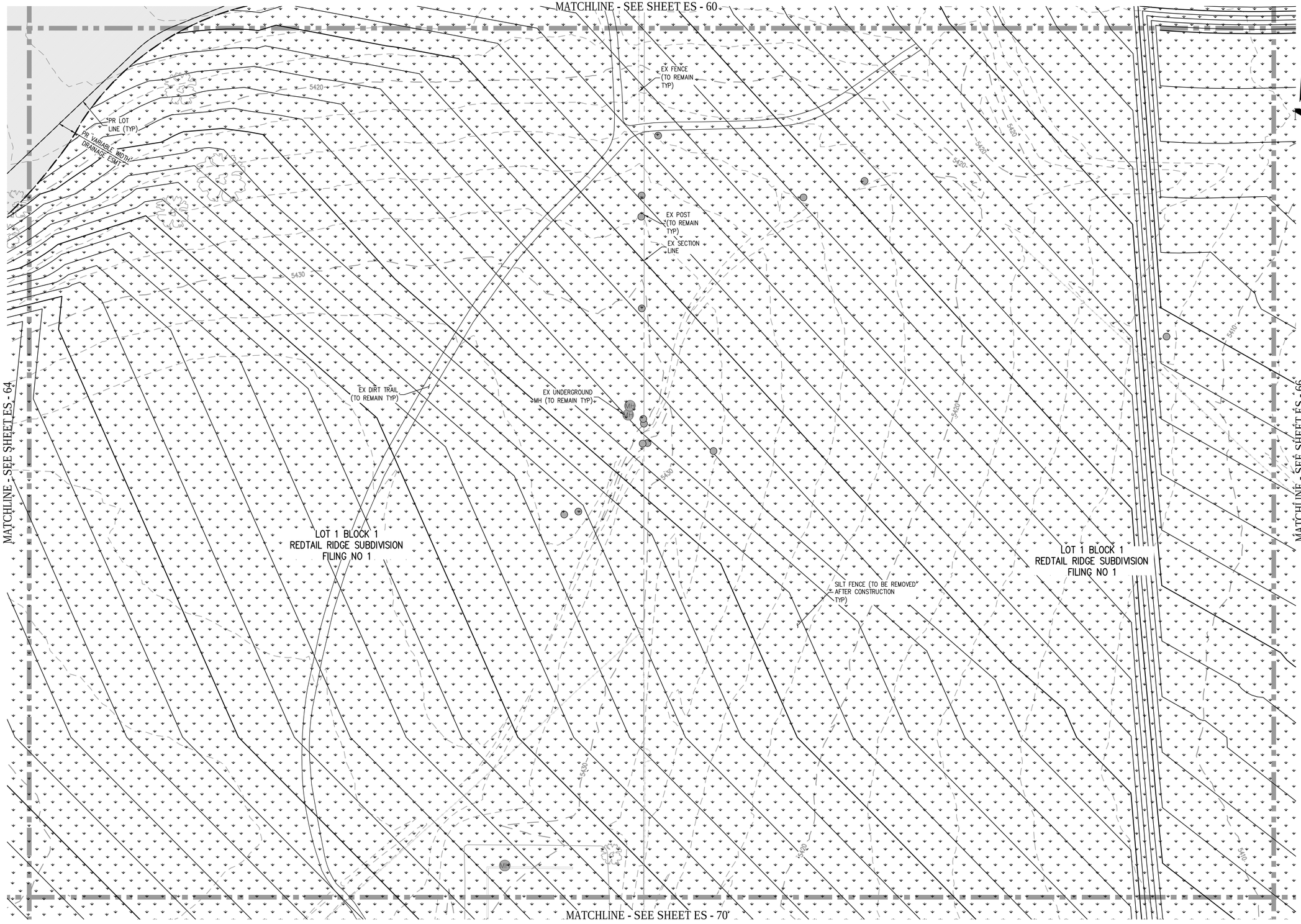
NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

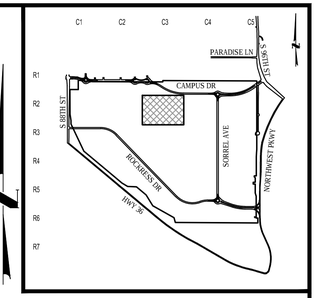
MATCHLINE - SEE SHEET ES - 60

MATCHLINE - SEE SHEET ES - 64

MATCHLINE - SEE SHEET ES - 66

MATCHLINE - SEE SHEET ES - 70





KEY MAP

1"=2000'

NOTES:

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LEGEND:

- RIGHT-OF-WAY
- 5258 5260 EXISTING CONTOURS
- 5264 5265 PROPOSED CONTOURS
- W EXISTING WATER LINE
- ST EXISTING STORM MAIN
- SS EXISTING SANITARY SEWER
- UE E EXISTING UNDERGROUND ELECTRIC
- UT EXISTING UNDERGROUND TELECOM
- W PROPOSED WATER
- ST PROPOSED STORM SEWER
- SS PROPOSED SANITARY SEWER
- LOC LIMITS OF CONSTRUCTION
- CF CONSTRUCTION FENCE
- SF SILT FENCE
- IP INLET PROTECTION
- CIP CULVERT PROTECTION
- SM SEEDING AND MULCHING
- RS ROCK SOCK
- EXISTING STORM SEWER
- AREA OF DRAINAGE DISTURBANCE
- UNDISTURBED AREA

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40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

HARRIS KOCHER SMITH
1120 Lincoln Street, Suite 1000
Denver, Colorado 80203
P: 303.623.6300 F: 303.623.6311
HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - FINAL - R2 C3

ISSUE DATE: 11-15-2019 | PROJECT #: 190108

DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.

ES - 65

ES - 65 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - FINAL - 2.DWG LAYOUT: NAVATNY - R2 C3
12 XREFS: client logo, e-base, e-legal, e-util, key map, p-base-f1, p-base-f2[U], p-base-sand-f1, p-legal-f1, p-legal-f2[U], p-util-f1, stamp - swmp
PLOTTED: THU 04/01/21 11:06:21A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 61

MATCHLINE - SEE SHEET ES - 65

MATCHLINE - SEE SHEET ES - 67

MATCHLINE - SEE SHEET ES - 71

EX DIRT TRAIL (TO REMAIN TYP)

EX FENCE (TO REMAIN TYP)

LOT 1 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

SORREL AVE
(120' ROW)

PR STM INLET (TYP)

PR STM MH (TYP)

INLET PROTECTION (TO BE REMOVED AFTER CONSTRUCTION TYP)

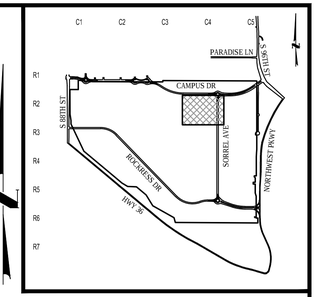
ROCK SOCK (TO BE REMOVED AFTER CONSTRUCTION TYP)

PR STREET LIGHT (TYP)

SILT FENCE (TO BE REMOVED AFTER CONSTRUCTION TYP)

PR SS MH (TYP)

PR 30' UTILITY ESMT



KEY MAP
1"=2000'

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- UNDISTURBED AREA

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40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

HARRIS KOCHER SMITH
1120 Lincoln Street, Suite 1000
Denver, Colorado 80203
P: 303.623.6300 F: 303.623.6311
HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - FINAL - R2 C4

ISSUE DATE: 11-15-2019	PROJECT #: 190108
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 66
ES - 66 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - FINAL - 2.DWG LAYOUT: NAWATNY - R2 C4
12 XREFs: client logo, e-base, e-legal, e-util, key map, pBase1-f, pBase-f2(U), pBase-Auth-f1, pBase-f1, pLegal-f2(U), pLegal-f1, pLegal-f2(U), pLegal-f1, pLegal-f2(U), p-util-f1, stamp - swmp
PLOTTED: TIR 04/01/21 11:00:38A BY: TIM SAYLER

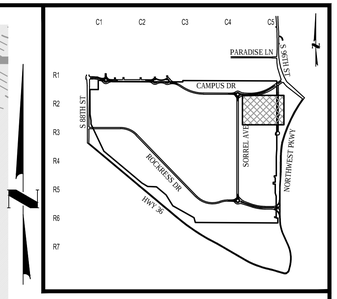
NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 62

MATCHLINE - SEE SHEET ES - 66



MATCHLINE - SEE SHEET ES - 72



KEY MAP
1"=2000'

NOTES:

1. ALL EXISTING SURFACE FEATURES NOT INCLUDED WITHIN FILING NO. 1 ARE TO REMAIN UNLESS OTHERWISE NOTED. SEE SHEETS MASTER UTILITY AND SURFACE IMPROVEMENTS PLAN FOR PHASING.
2. EXISTING SURFACE FEATURES ARE TO BE REMOVED AS NEEDED TO ACCOMMODATE THE PROPOSED DRAINAGE SWALES.
3. ALL EXISTING SURFACE FEATURES EXISTING UTILITIES IN THE UNDISTURBED AREA ARE TO REMAIN UNLESS OTHERWISE NOTED.

LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS (5258 / 5260)
- PROPOSED CONTOURS (5264 / 5265)
- EXISTING WATER LINE (W)
- EXISTING STORM MAIN (ST)
- EXISTING SANITARY SEWER (SS)
- EXISTING UNDERGROUND ELECTRIC (UE)
- EXISTING UNDERGROUND TELECOM (UT)
- PROPOSED WATER (W)
- PROPOSED STORM SEWER (ST)
- PROPOSED SANITARY SEWER (SS)
- LIMITS OF CONSTRUCTION (LOC)
- CONSTRUCTION FENCE (CF)
- SILT FENCE (SF)
- INLET PROTECTION (IP)
- CULVERT PROTECTION (CIP)
- SEEDING AND MULCHING (SM)
- ROCK SOCK (RS)
- EXISTING STORM SEWER
- AREA OF DRAINAGE DISTURBANCE
- UNDISTURBED AREA

811 Know what's below. Call before you dig.

CALL 3 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

HARRIS KOCHER SMITH
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Denver, Colorado 80203
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HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - FINAL - R2 C5

ISSUE DATE: 11-15-2019 | PROJECT #: 190108

DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 67
ES - 67 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - FINAL - 2.DWG LAYOUT: NAVATNY - R2 C5
12 XREFS: client logo, e-base, e-sign, e-util, key map, p-base-f1, p-base-f2(U), p-base-unit-f1, p-legal-f1, p-legal-f2(U), p-util-f1, stamp - swmp
PLOTTED: THU 04/01/21 11:06:53A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 63

PR LOT LINE (TYP)

PR FUTURE DETENTION POND (TO BE BUILT WITH REDTAIL RIDGE SUBDIVISION FILING NO. 2)

SEDIMENT CONTROL LOG AND SILT FENCE (TO BE REMOVED AFTER CONSTRUCTION TYP)

PR CULVERT PROTECTION (TO BE REMOVED AFTER CONSTRUCTION TYP)

CONSTRUCTION FENCE (TO BE REMOVED AFTER CONSTRUCTION)

PR INLET PROTECTION (TO BE REMOVED AFTER CONSTRUCTION TYP)

LOT 1 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

EX 75' PSCO EASMNET
BK 725 PG. 77
(TO REMAIN)

LOT 2 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

S 88TH STREET
VARIABLE WIDTH ROW

EX 12' SIDEWALK

EX 10' IRRIGATION EASEMENT
REC. NO. 3046886
(TO BE VACATED)

HIGHWAY 36
VARIABLE WIDTH ROW

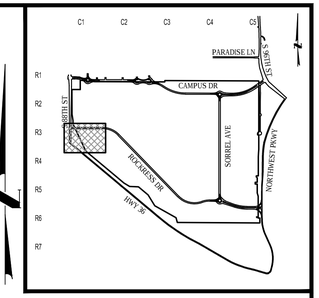
EX FENCE
(TO REMAIN TYP)

EX CHANNEL
(TO REMAIN TYP)

5470 5475 5480 5460

MATCHLINE - SEE SHEET ES - 69

MATCHLINE - SEE SHEET ES - 73



KEY MAP
1"=2000'

NOTES:

1. ALL EXISTING SURFACE FEATURES NOT INCLUDED WITHIN FILING NO. 1 ARE TO REMAIN UNLESS OTHERWISE NOTED. SEE SHEETS MASTER UTILITY AND SURFACE IMPROVEMENTS PLAN FOR PHASING.
2. EXISTING SURFACE FEATURES ARE TO BE REMOVED AS NEEDED TO ACCOMMODATE THE PROPOSED DRAINAGE SWALES.
3. ALL EXISTING SURFACE FEATURES EXISTING UTILITIES IN THE UNDISTURBED AREA ARE TO REMAIN UNLESS OTHERWISE NOTED.

LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS (5258 / 5260)
- PROPOSED CONTOURS (5264 / 5265)
- EXISTING WATER LINE (W)
- EXISTING STORM MAIN (ST)
- EXISTING SANITARY SEWER (SS)
- EXISTING UNDERGROUND ELECTRIC (UE)
- EXISTING UNDERGROUND TELECOM (UT)
- PROPOSED WATER (W)
- PROPOSED STORM SEWER (ST)
- PROPOSED SANITARY SEWER (SS)
- LIMITS OF CONSTRUCTION (LOC)
- CONSTRUCTION FENCE (CF)
- SILT FENCE (SF)
- INLET PROTECTION (IP)
- CULVERT PROTECTION (CP)
- SEEDING AND MULCHING (SM)
- ROCK SOCK (RS)
- EXISTING STORM SEWER
- AREA OF DRAINAGE DISTURBANCE
- UNDISTURBED AREA

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CALL 3 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

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BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - FINAL - R3 C1

ISSUE DATE: 11-15-2019 | PROJECT #: 190108

DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 68
ES - 68 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP_FINAL_2.DWG, LAYOUT: NAVATNY - R3 C1
12 XREFs: client logo, c-base, e-topi, e-util, key map, p-base-t2[1], p-base-land-f1, p-legal-f1, p-legal-f2[1], p-util-f1, stamp - swmp
PLOTTED: THU 04/01/21 11:01:12A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH.

MATCHLINE - SEE SHEET ES - 64

MATCHLINE - SEE SHEET ES - 68

MATCHLINE - SEE SHEET ES - 70

MATCHLINE - SEE SHEET ES - 74

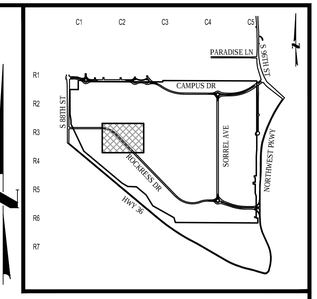
EX 75' PSCO EASEMENT BK 726 PG 771 (TO REMAIN)

PR LOT LINE (TYP)

LOT 1 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

LOT 2 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

FILT FENCE (TO BE REMOVED AFTER CONSTRUCTION TYP)



KEY MAP
1"=2000'

NOTES:

1. ALL EXISTING SURFACE FEATURES NOT INCLUDED WITHIN FILING NO. 1 ARE TO REMAIN UNLESS OTHERWISE NOTED. SEE SHEETS MASTER UTILITY AND SURFACE IMPROVEMENTS PLAN FOR PHASING.
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LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS (5258 / 5260)
- PROPOSED CONTOURS (5264 / 5265)
- EXISTING WATER LINE (W)
- EXISTING STORM MAIN (ST)
- EXISTING SANITARY SEWER (SS)
- EXISTING UNDERGROUND ELECTRIC (UE)
- EXISTING UNDERGROUND TELECOM (UT)
- PROPOSED WATER (W)
- PROPOSED STORM SEWER (ST)
- PROPOSED SANITARY SEWER (SS)
- LIMITS OF CONSTRUCTION (LOC)
- CONSTRUCTION FENCE (CF)
- SILT FENCE (SF)
- INLET PROTECTION (IP)
- CULVERT PROTECTION (CIP)
- SEEDING AND MULCHING (SM)
- ROCK SOCK (RS)
- EXISTING STORM SEWER
- AREA OF DRAINAGE DISTURBANCE
- UNDISTURBED AREA

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40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

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HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - FINAL - R3 C2

ISSUE DATE: 11-15-2019 | PROJECT #: 190108

DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 69
ES - 69 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - FINAL - 2.DWG LAYOUT: NAWATNY - R3 C2
12 XREFS: client logo, e-base, e-legal, e-util, key map, pBase-f1, p-base-f2[U], p-base-hatch-f1, p-legal-f1, p-legal-f2[U], p-util-f1, stamp - swmp
PLOTTED: TRU 04/01/21 11:01:27A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH.

MATCHLINE - SEE SHEET ES - 65

MATCHLINE - SEE SHEET ES - 69

MATCHLINE - SEE SHEET ES - 71

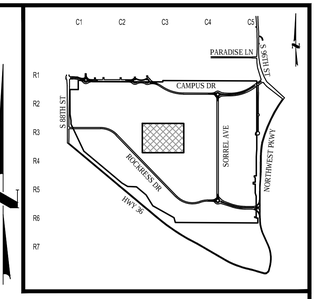
MATCHLINE - SEE SHEET ES - 75

EX SECTION LINE

EX SECTION LINE

LOT 1 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 2

LOT 1 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1



KEY MAP
1"=2000'

NOTES:

1. ALL EXISTING SURFACE FEATURES NOT INCLUDED WITHIN FILING NO. 1 ARE TO REMAIN UNLESS OTHERWISE NOTED. SEE SHEETS MASTER UTILITY AND SURFACE IMPROVEMENTS PLAN FOR PHASING.
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LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS (5258 / 5260)
- PROPOSED CONTOURS (5264 / 5265)
- W — EXISTING WATER LINE
- ST — EXISTING STORM MAIN
- SS — EXISTING SANITARY SEWER
- UE — E — EXISTING UNDERGROUND ELECTRIC
- UT — EXISTING UNDERGROUND TELECOM
- W — PROPOSED WATER
- PROPOSED STORM SEWER
- SS — PROPOSED SANITARY SEWER
- LOC — LIMITS OF CONSTRUCTION
- CF — CONSTRUCTION FENCE
- SF — SILT FENCE
- IP — INLET PROTECTION
- CIP — CULVERT PROTECTION
- SM — SEEDING AND MULCHING
- RS — ROCK SOCK
- EXISTING STORM SEWER
- AREA OF DRAINAGE DISTURBANCE
- UNDISTURBED AREA

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40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

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BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - FINAL - R3 C3

ISSUE DATE: 11-15-2019	PROJECT #: 190108
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 70
ES - 70 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - FINAL - 2\DWG LAYOUT\ - NAWATNY - R3 C3
12 XREFs: client logo, e-base, e-legal, e-util, key map, p-base-l, p-base-l2(1), p-base-land-l1, p-legal-l, p-legal-l2(1), p-util-l, stamp - swmp
PLOTTED: THU 04/01/21 11:01:42A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 66

MATCHLINE - SEE SHEET ES - 71

MATCHLINE - SEE SHEET ES - 72

MATCHLINE - SEE SHEET ES - 76

LOT 1 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

SORREL AVE
(120' ROW)

EX SECTION LINE

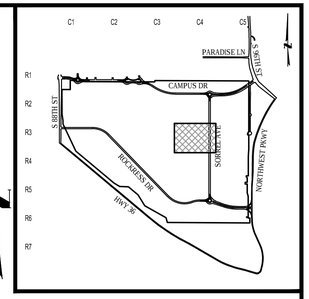
PR SS MH (TYP)

SILT FENCE (TO BE REMOVED AFTER CONSTRUCTION TYP)

ROCK SOCK (TO BE REMOVED AFTER CONSTRUCTION TYP)

PR STREET LIGHT (TYP)

5410 5400 5390 5420 5415 5405 5395 5385 5380



KEY MAP
1"=2000'

NOTES:

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LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS
- PROPOSED CONTOURS
- EXISTING WATER LINE
- EXISTING STORM MAIN
- EXISTING SANITARY SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING UNDERGROUND TELECOM
- PROPOSED WATER
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- LIMITS OF CONSTRUCTION
- CONSTRUCTION FENCE
- SILT FENCE
- INLET PROTECTION
- CULVERT PROTECTION
- SEEDING AND MULCHING
- ROCK SOCK
- EXISTING STORM SEWER
- AREA OF DRAINAGE DISTURBANCE
- UNDISTURBED AREA

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CALL 3 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

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HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - FINAL - R3 C4

ISSUE DATE: 11-15-2019 | PROJECT #: 190108

DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 71
ES - 71 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - FINAL - 2.DWG LAYOUT: NAVATNY - R3 C4
12 XREFS: client logo, e-base, e-sign, e-soil, key map, p-base-H, p-base-2[U], p-base-sanit-H, p-legal-H, p-legal-2[U], p-util-H, stamp - swmp
PLOTTED: THU 04/01/21 11:01:56A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 67

MATCHLINE - SEE SHEET ES - 71

MATCHLINE - SEE SHEET ES - 77

LOT 1 BLOCK 2
REDTAIL RIDGE SUBDIVISION
FILING NO 1

TRACT E
REDTAIL RDIGE
SUBDIVISION
FILING NO 1

S 96TH STREET
60' ROW

NORTHWEST PKWY
VARIABLE WIDTH ROW

EX TELECOM RISER
(TO REMAIN)

EX LIGHT POLE,
(TO REMAIN)

EX ELECTRIC VAULT
(TO REMAIN)

EX OVERHEAD ELECTRIC
(TO REMAIN)

EX STORM MH
(TO REMAIN)

CIP
CULVERT PROTECTION
(TO BE REMOVED AFTER
CONSTRUCTION TYP)

EX FENCE
(TO REMAIN TYP)

EX POST
(TO REMAIN)

EX FENCE
(TO REMAIN)

PR LOT LINE
(TYP)

EX RIP RAP
(TO REMAIN)

SILT FENCE (TO BE
REMOVED AFTER
CONSTRUCTION TYP)

PR 10'
DRY UTILITY ESMT

PR 30'
UTILITY ESMT

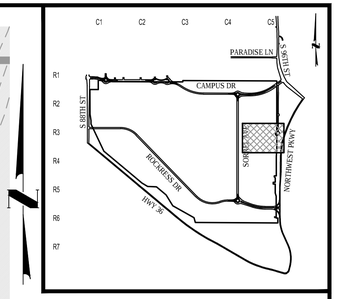
PR 12'
SIDEWALK

PROPERTY
BOUNDARY

PR 10'
DRY UTILITY ESMT

PR 12'
ACCESS ESMT

5380 5385 5390 5370 5374



KEY MAP
1"=2000'

NOTES:

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LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS (5258 / 5260)
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- EXISTING WATER LINE (W)
- EXISTING STORM MAIN (ST)
- EXISTING SANITARY SEWER (SS)
- EXISTING UNDERGROUND ELECTRIC (UE)
- EXISTING UNDERGROUND TELECOM (UT)
- PROPOSED WATER (W)
- PROPOSED STORM SEWER (ST)
- PROPOSED SANITARY SEWER (SS)
- LIMITS OF CONSTRUCTION (LOC)
- CONSTRUCTION FENCE (CF)
- SILT FENCE (SF)
- INLET PROTECTION (IP)
- CULVERT PROTECTION (CIP)
- SEEDING AND MULCHING (SM)
- ROCK SOCK (RS)
- EXISTING STORM SEWER
- AREA OF DRAINAGE DISTURBANCE
- UNDISTURBED AREA

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40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

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HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - FINAL - R3 C5

ISSUE DATE: 11-15-2019	PROJECT #: 190108
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

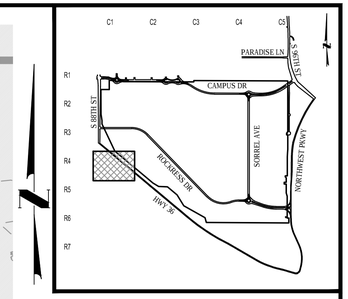
SHEET NO.
ES - 72
ES - 72 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - FINAL - 2.DWG LAYOUT: NAWATN - R3 C5
12 XREFS: client logo, e-base, e-legal, e-util, key map, pBase-f1, p-base-f2U, p-base-numf-f1, p-legal-f1, p-legal-f2U, p-util-f1, stamp - swmp
PLOTTED: THU 04/01/21 11:02:33A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 68





KEY MAP
1"=2000'

NOTES:

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MATCHLINE - SEE SHEET ES - 74

LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS (5258, 5260)
- PROPOSED CONTOURS (5264, 5265)
- EXISTING WATER LINE (W)
- EXISTING STORM MAIN (ST)
- EXISTING SANITARY SEWER (SS)
- EXISTING UNDERGROUND ELECTRIC (UE)
- EXISTING UNDERGROUND TELECOM (UT)
- PROPOSED WATER (W)
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER (SS)
- LIMITS OF CONSTRUCTION (LOC)
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- SILT FENCE (SF)
- INLET PROTECTION (IP)
- CULVERT PROTECTION (CVP)
- SEEDING AND MULCHING (SM)
- ROCK SOCK (RS)
- EXISTING STORM SEWER
- AREA OF DRAINAGE DISTURBANCE
- UNDISTURBED AREA

811 Know what's below. Call before you dig.

CALL 3 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

HARRIS KOCHER SMITH
1120 Lincoln Street, Suite 1000
Denver, Colorado 80203
P: 303.623.6300 F: 303.623.6311
HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - FINAL - R4 C1

ISSUE DATE: 11-15-2019	PROJECT #: 190108
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 73
ES - 73 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - FINAL - 2.DWG LAYOUT: NAVATNY - R4 C1
12 XREFs: cliver logo, e-base, e-legal, e-util, key map, p-base-f1, p-base-f2[U], p-base-land-f1, p-legal-f1, p-legal-f2[U], p-util-f1, stamp - swmp
PLOTTED: TIR| 04/01/21 11:02:52A BY: TIM SAVLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH.

MATCHLINE - SEE SHEET ES - 69

MATCHLINE - SEE SHEET ES - 73

MATCHLINE - SEE SHEET ES - 75

MATCHLINE - SEE SHEET ES - 78

LOT 2 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

EX SECTION LINE

PR LOT LINE

EX 75' PSCO EASEMENT
BK: 725 PG: 77
(TO REMAIN)

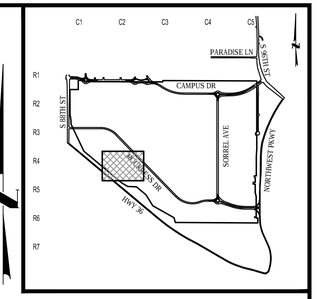
EX 10' IRRIGATION EASEMENT
REC. NO. 3348888
(TO BE VACATED)

CULVERT PROTECTION
(TO BE REMOVED
AFTER CONSTRUCTION)

HIGHWAY 36
VARIABLE WIDTH ROW

PR FUTURE DETENTION POND (TO
BE BUILT WITH REDTAIL RIDGE
SUBDIVISION FILING NO. 2)

SILT FENCE (TO BE
REMOVED AFTER
CONSTRUCTION TYP)



KEY MAP
1"=2000'

NOTES:

1. ALL EXISTING SURFACE FEATURES NOT INCLUDED WITHIN FILING NO. 1 ARE TO REMAIN UNLESS OTHERWISE NOTED. SEE SHEETS MASTER UTILITY AND SURFACE IMPROVEMENTS PLAN FOR PHASING.
2. EXISTING SURFACE FEATURES ARE TO BE REMOVED AS NEEDED TO ACCOMMODATE THE PROPOSED DRAINAGE SWALES.
3. ALL EXISTING SURFACE FEATURES EXISTING UTILITIES IN THE UNDISTURBED AREA ARE TO REMAIN UNLESS OTHERWISE NOTED.

LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS
- PROPOSED CONTOURS
- EXISTING WATER LINE
- EXISTING STORM MAIN
- EXISTING SANITARY SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING UNDERGROUND TELECOM
- PROPOSED WATER
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- LIMITS OF CONSTRUCTION
- CONSTRUCTION FENCE
- SILT FENCE
- INLET PROTECTION
- CULVERT PROTECTION
- SEEDING AND MULCHING
- ROCK SOCK
- EXISTING STORM SEWER
- AREA OF DRAINAGE DISTURBANCE
- UNDISTURBED AREA

811 Know what's below. Call before you dig.
CALL 3 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

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Denver, Colorado 80203
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BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - FINAL - R4 C2

ISSUE DATE: 11-15-2019 | PROJECT #: 190108

DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 74
ES - 74 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - FINAL - 3.DWG LAYOUT: NAVAT'NY - R4 C2
12 XREFs: client logo, e-base, e-legal, e-util, key map, p-base-f1, p-base-f2(U), p-base-land-f1, p-legal-f1, p-legal-f2(U), p-util-f1, stamp - swmp
PLOTTED: THU 04/01/21 11:03:07A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 70

MATCHLINE - SEE SHEET ES - 74

MATCHLINE - SEE SHEET ES - 76

MATCHLINE - SEE SHEET ES - 79

LOT 1 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 2

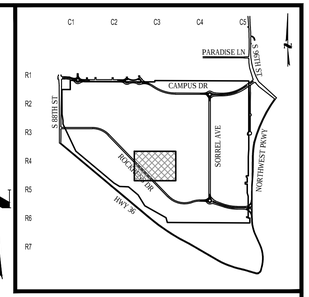
LOT 1 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

EX SECTION LINE

EX SILT FENCE (TO BE REMOVED AFTER CONSTRUCTION TYP)

PR LOT LINE

EX 75' PSCO EASEMENT BK 725 PG 77 (TO REMAIN)



KEY MAP
1"=2000'

NOTES:

1. ALL EXISTING SURFACE FEATURES NOT INCLUDED WITHIN FILING NO. 1 ARE TO REMAIN UNLESS OTHERWISE NOTED. SEE SHEETS MASTER UTILITY AND SURFACE IMPROVEMENTS PLAN FOR PHASING.
2. EXISTING SURFACE FEATURES ARE TO BE REMOVED AS NEEDED TO ACCOMMODATE THE PROPOSED DRAINAGE SWALES.
3. ALL EXISTING SURFACE FEATURES EXISTING UTILITIES IN THE UNDISTURBED AREA ARE TO REMAIN UNLESS OTHERWISE NOTED.

LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS (5258 / 5260)
- PROPOSED CONTOURS (5264 / 5265)
- EXISTING WATER LINE (W)
- EXISTING STORM MAIN (ST)
- EXISTING SANITARY SEWER (SS)
- EXISTING UNDERGROUND ELECTRIC (UE)
- EXISTING UNDERGROUND TELECOM (UT)
- PROPOSED WATER (W)
- PROPOSED STORM SEWER (ST)
- PROPOSED SANITARY SEWER (SS)
- LIMITS OF CONSTRUCTION (LOC)
- CONSTRUCTION FENCE (CF)
- SILT FENCE (SF)
- INLET PROTECTION (IP)
- CULVERT PROTECTION (CIP)
- SEEDING AND MULCHING (SM)
- ROCK SOCK (RS)
- EXISTING STORM SEWER
- AREA OF DRAINAGE DISTURBANCE
- UNDISTURBED AREA

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CALL 3 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

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HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - FINAL - R4 C3

ISSUE DATE: 11-15-2019 | PROJECT #: 190108

DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 75
ES - 75 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP_FINAL_3.DWG, LAYOUT: NAVATNY - R4 C3
12 XREFS: client logo, e-base, e-topo, e-util, key map, p-base-2[U], p-base-1[U], p-base-land-1[U], p-legal-1[U], p-legal-2[U], p-util-1[U], stamp - swmp
PLOTTED: THU 04/01/21 11:03:22A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH.

MATCHLINE - SEE SHEET ES - 71

MATCHLINE - SEE SHEET ES - 75

MATCHLINE - SEE SHEET ES - 77

MATCHLINE - SEE SHEET ES - 80

LOT 1 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO. 1

EX 26' PSCO EASEMENT
REC. NO. 0063945B
(PORTION TO REMAIN)

EX 50' PSCO EASEMENT
REC. NO. 543534
(TO REMAIN)

EX 10' PSCO EASEMENT
REC. NO. 0067057
(TO BE PARTIALLY VACATED)

EX 26' PSCO EASEMENT
REC. NO. 531607
(TO REMAIN)

PR STREET LIGHT (TYP)

SILT FENCE (TO BE REMOVED AFTER CONSTRUCTION TYP)

ROCK SOCK (TO BE REMOVED AFTER CONSTRUCTION TYP)

EX SECTION LINE

SORREL AVE
(120' ROW)

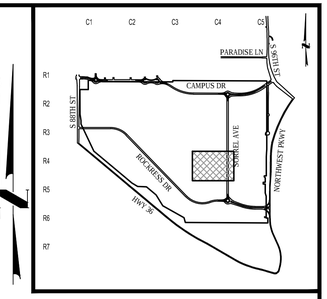
5410

5400

5395

5390

RS



KEY MAP
1"=2000'

NOTES:

1. ALL EXISTING SURFACE FEATURES NOT INCLUDED WITHIN FILING NO. 1 ARE TO REMAIN UNLESS OTHERWISE NOTED. SEE SHEETS MASTER UTILITY AND SURFACE IMPROVEMENTS PLAN FOR PHASING.
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3. ALL EXISTING SURFACE FEATURES EXISTING UTILITIES IN THE UNDISTURBED AREA ARE TO REMAIN UNLESS OTHERWISE NOTED.

LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS (5258 / 5260)
- PROPOSED CONTOURS (5264 / 5265)
- W — EXISTING WATER LINE
- ST — EXISTING STORM MAIN
- SS — EXISTING SANITARY SEWER
- UE — E — EXISTING UNDERGROUND ELECTRIC
- UT — EXISTING UNDERGROUND TELECOM
- W — PROPOSED WATER
- PROPOSED STORM SEWER
- SS — PROPOSED SANITARY SEWER
- LOC — LIMITS OF CONSTRUCTION
- CF — CONSTRUCTION FENCE
- SF — SILT FENCE
- IP — INLET PROTECTION
- CIP — CULVERT PROTECTION
- SM — SEEDING AND MULCHING
- RS — ROCK SOCK
- EXISTING STORM SEWER
- AREA OF DRAINAGE DISTURBANCE
- UNDISTURBED AREA

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CALL 3 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

HARRIS KOCHER SMITH
1120 Lincoln Street, Suite 1000
Denver, Colorado 80203
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HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - FINAL - R4 C4

ISSUE DATE: 11-15-2019 | PROJECT #: 190108

DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 76
ES - 76 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - FINAL - 2.DWG LAYOUT: NAVATNY - R4 C4
12 XREFS: client logo, e-base, e-legal, e-util, key map, p-base-f1, p-base-f2(U), p-base-sand-f1, p-legal-f1, p-legal-f2(U), p-util-f1, stamp - swmp
PLOTTED: THU 04/01/21 11:03:37A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 72

MATCHLINE - SEE SHEET ES - 76

MATCHLINE - SEE SHEET ES - 81

LOT 1 BLOCK 2
REDTAIL RIDGE SUBDIVISION
FILING NO 1

TRACT E
REDTAIL RIDGE
SUBIVISION
FILING NO 1

SILT FENCE (TO BE REMOVED AFTER CONSTRUCTION TYP)

PR 12' TRAIL

EX 25' PSCO EASEMENT REC. NO. 01000400 (TO REMAIN)

EX 15' PSCO EASEMENT REC. NO. 310494 (TO REMAIN)

PR LOT LINE (TYP)

NORTHWEST PKWY
VARIABLE WIDTH ROW

EX STORM INLET (TO REMAIN)

EX 40' PSCO EASEMENT REC. NO. 290792 (TO REMAIN)

EX 30' PSCO EASEMENT REC. NO. 01014582 (TO REMAIN)

EX TRANSFORMER (TO REMAIN TYP)

EX SECTION LINE

PR CULVERT PROTECTION (TO BE REMOVED AFTER CONSTRUCTION TYP)

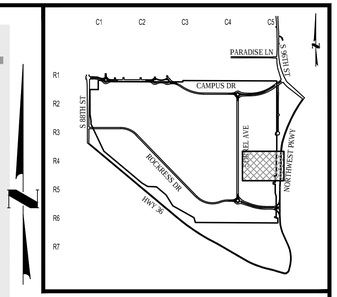
EX TELECOM VAULT (TO REMAIN TYP)

ROCK SOCK (TO BE REMOVED AFTER CONSTRUCTION TYP)

EX 26' PSCO EASEMENT REC. NO. 531607 (TO REMAIN)

EX FENCE (TO BE REMOVED)

EX 30' PSCO EASEMENT REC. NO. 531606 (TO REMAIN)



KEY MAP
1"=2000'

NOTES:

1. ALL EXISTING SURFACE FEATURES NOT INCLUDED WITHIN FILING NO. 1 ARE TO REMAIN UNLESS OTHERWISE NOTED. SEE SHEETS MASTER UTILITY AND SURFACE IMPROVEMENTS PLAN FOR PHASING.
2. EXISTING SURFACE FEATURES ARE TO BE REMOVED AS NEEDED TO ACCOMMODATE THE PROPOSED DRAINAGE SWALES.
3. ALL EXISTING SURFACE FEATURES EXISTING UTILITIES IN THE UNDISTURBED AREA ARE TO REMAIN UNLESS OTHERWISE NOTED.

LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS
- PROPOSED CONTOURS
- EXISTING WATER LINE
- EXISTING STORM MAIN
- EXISTING SANITARY SEWER
- EXISTING UNDERGROUND ELECTRIC
- EXISTING UNDERGROUND TELECOM
- PROPOSED WATER
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- LIMITS OF CONSTRUCTION
- CONSTRUCTION FENCE
- SILT FENCE
- INLET PROTECTION
- CULVERT PROTECTION
- SEEDING AND MULCHING
- ROCK SOCK
- EXISTING STORM SEWER
- AREA OF DRAINAGE DISTURBANCE
- UNDISTURBED AREA

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CALL 3 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

HARRIS KOCHER SMITH
1120 Lincoln Street, Suite 1000
Denver, Colorado 80203
P: 303.623.6300 F: 303.623.6311
HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - FINAL - R4 C5

ISSUE DATE: 11-15-2019 | PROJECT #: 190108

DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 77
ES - 77 OF ES - 91

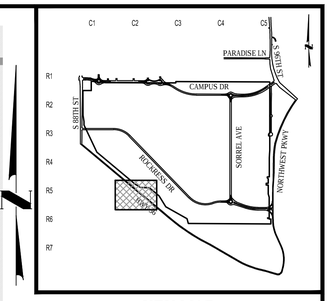
FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - FINAL - 3.DWG LAYOUT: NAVA17W - R4 C5
12 XREFS: client logo, c-base, c-legal, c-util, key map, p-base-f2(U), p-base-land-f1, p-legal-f1, p-legal-f2(U), p-util-f1, stamp - swmp
PLOTTED: THU 04/01/21 11:03:57A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 74



MATCHLINE - SEE SHEET ES - 79



KEY MAP
1"=2000'

NOTES:

1. ALL EXISTING SURFACE FEATURES NOT INCLUDED WITHIN FILING NO. 1 ARE TO REMAIN UNLESS OTHERWISE NOTED. SEE SHEETS MASTER UTILITY AND SURFACE IMPROVEMENTS PLAN FOR PHASING.
2. EXISTING SURFACE FEATURES ARE TO BE REMOVED AS NEEDED TO ACCOMMODATE THE PROPOSED DRAINAGE SWALES.
3. ALL EXISTING SURFACE FEATURES EXISTING UTILITIES IN THE UNDISTURBED AREA ARE TO REMAIN UNLESS OTHERWISE NOTED.

LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS (5258 / 5260)
- PROPOSED CONTOURS (5264 / 5265)
- EXISTING WATER LINE (W)
- EXISTING STORM MAIN (ST)
- EXISTING SANITARY SEWER (SS)
- EXISTING UNDERGROUND ELECTRIC (UE)
- EXISTING UNDERGROUND TELECOM (UT)
- PROPOSED WATER (W)
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER (SS)
- LIMITS OF CONSTRUCTION (LOC)
- CONSTRUCTION FENCE (CF)
- SILT FENCE (SF)
- INLET PROTECTION (IP)
- CULVERT PROTECTION (CVP)
- SEEDING AND MULCHING (SM)
- ROCK SOCK (RS)
- EXISTING STORM SEWER
- AREA OF DRAINAGE DISTURBANCE
- UNDISTURBED AREA

811 Know what's below. Call before you dig.

CALL 3 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MB

HARRIS KOCHER SMITH
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Denver, Colorado 80203
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HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - FINAL - R5 C2

ISSUE DATE: 11-15-2019 | PROJECT #: 190108

DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 78
ES - 78 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - FINAL - 3.DWG LAYOUT: NAV4TNY - R5 C2
12 XREFs: client logo, e-base, e-legal, e-util, key map, p-base-f, p-base-f2[U], p-base-ind-f, p-legal-f, p-legal-f2[U], p-util-f, stamp - swmp
PLOTTED: TIR(04/01/21 11:04:2A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 47

MATCHLINE - SEE SHEET ES - 78

MATCHLINE - SEE SHEET ES - 80

MATCHLINE - SEE SHEET ES - 82

LOT 2 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

LOT 2 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

EX OVERHEAD ELECTRIC (TO REMAIN TYP)

EX 75' PSCO EASEMENT BK 725 PG 77 (TO REMAIN)

SILT FENCE (TO BE REMOVED AFTER CONSTRUCTION TYP)

PR WAT MAIN

EX ELECTRIC POLE (TO REMAIN TYP)

EX DIRT TRAIL (TO REMAIN)

EX FENCE (TO REMAIN TYP)

PROPERTY BOUNDARY

PROPERTY BOUNDARY

PROPERTY BOUNDARY

EX STREET LIGHT (TO REMAIN)

EX CHANNEL (TO REMAIN)

HIGHWAY 36
VARIABLE WIDTH ROW

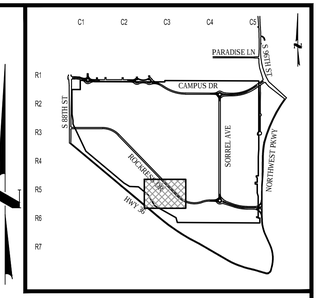
EX UTILITY MH (TO REMAIN TYP)

EX 10' IRRIGATION EASEMENT REC. NO. 3048888 (TO BE VACATED)

EX SECTION LINE

EX 10' IRRIGATION EASEMENT REC. NO. 3048888 (TO BE VACATED)

EX POST (TO REMAIN TYP)



KEY MAP
1"=2000'

NOTES:

1. ALL EXISTING SURFACE FEATURES NOT INCLUDED WITHIN FILING NO. 1 ARE TO REMAIN UNLESS OTHERWISE NOTED. SEE SHEETS MASTER UTILITY AND SURFACE IMPROVEMENTS PLAN FOR PHASING.
2. EXISTING SURFACE FEATURES ARE TO BE REMOVED AS NEEDED TO ACCOMMODATE THE PROPOSED DRAINAGE SWALES.
3. ALL EXISTING SURFACE FEATURES EXISTING UTILITIES IN THE UNDISTURBED AREA ARE TO REMAIN UNLESS OTHERWISE NOTED.

LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS (5258 / 5260)
- PROPOSED CONTOURS (5264 / 5265)
- EXISTING WATER LINE (W)
- EXISTING STORM MAIN (ST)
- EXISTING SANITARY SEWER (SS)
- EXISTING UNDERGROUND ELECTRIC (UE)
- EXISTING UNDERGROUND TELECOM (UT)
- PROPOSED WATER (W)
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER (SS)
- LIMITS OF CONSTRUCTION (LOC)
- CONSTRUCTION FENCE (CF)
- SILT FENCE (SF)
- INLET PROTECTION (IP)
- CULVERT PROTECTION (CIP)
- SEEDING AND MULCHING (SM)
- ROCK SOCK (RS)
- EXISTING STORM SEWER
- AREA OF DRAINAGE DISTURBANCE
- UNDISTURBED AREA

811 Know what's below. Call before you dig.

CALL 3 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MML

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HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - FINAL - R5 C3

ISSUE DATE: 11-15-2019	PROJECT #: 190108
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 79
ES - 79 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - FINAL - 4.DWG LAYOUT: NAVATNY - R5 C3
12 XREFS: client logo, e-base, e-legal, e-util, key map, p-base-f1, p-base-f2[U], p-base-sanf-f1, p-legal-f1, p-legal-f2[U], p-util-f1, xsamp - swmp
PLOTTED: THU 04/01/21 11:04:51A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MATCHLINE - SEE SHEET ES - 76

MATCHLINE - SEE SHEET ES - 79

MATCHLINE - SEE SHEET ES - 81

MATCHLINE - SEE SHEET ES - 83

LOT 1 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

LOT 1 BLOCK 2
REDTAIL RIDGE SUBDIVISION
FILING NO 1

LOT 2 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

LOT 3 BLOCK 1
REDTAIL RIDGE SUBDIVISION
FILING NO 1

TRACT F
REDTAIL RIDGE SUBDIVISION
FILING NO 1

SORREL AVE
(120' ROW)

ROCKCRESS DR
(120' ROW)

EX UNDERGROUND TELECOM (TO REMAIN TYP)

EX UNDERGROUND ELECTRIC (TO REMAIN TYP)

EX POST (TO REMAIN TYP)

EX ELECTRIC MH (TO REMAIN TYP)

EX FENCE (TO REMAIN TYP)

EX TRANSFORMER (TO REMAIN TYP)

EX MH (TO REMAIN TYP)

EX 50' PSCO EASEMENT REC. NO. 543534 (TO REMAIN)

EX 10' IRRIGATION EASEMENT REC. NO. 3048888 (TO BE VACATED)

EX 40' PSCO EASEMENT REC. NO. 0170067 (TO REMAIN)

EX TELECOM RISER (TO REMAIN TYP)

EX PROPERTY BOUNDARY REC. NO. 531604 (TO REMAIN)

EX BLDG (TO REMAIN)

PR STREET LIGHT (TYP)

CONSTRUCTION AND SILT FENCE (TO BE REMOVED AFTER CONSTRUCTION TYP)

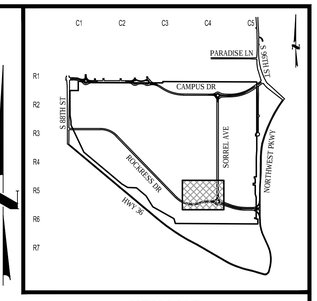
ROCK SOCK (TO BE REMOVED AFTER CONSTRUCTION TYP)

INLET PROTECTION (TO BE REMOVED AFTER CONSTRUCTION TYP)

PR WAT MAIN (TYP)

PR STM MH (TYP)

PR SS MH (TYP)



KEY MAP
1"=2000'

NOTES:

1. ALL EXISTING SURFACE FEATURES NOT INCLUDED WITHIN FILING NO. 1 ARE TO REMAIN UNLESS OTHERWISE NOTED. SEE SHEETS MASTER UTILITY AND SURFACE IMPROVEMENTS PLAN FOR PHASING.
2. EXISTING SURFACE FEATURES ARE TO BE REMOVED AS NEEDED TO ACCOMMODATE THE PROPOSED DRAINAGE SWALES.
3. ALL EXISTING SURFACE FEATURES EXISTING UTILITIES IN THE UNDISTURBED AREA ARE TO REMAIN UNLESS OTHERWISE NOTED.

LEGEND:

- RIGHT-OF-WAY
- EXISTING CONTOURS (5258 / 5260)
- PROPOSED CONTOURS (5264 / 5265)
- EXISTING WATER LINE (W)
- EXISTING STORM MAIN (ST)
- EXISTING SANITARY SEWER (SS)
- EXISTING UNDERGROUND ELECTRIC (UE)
- EXISTING UNDERGROUND TELECOM (UT)
- PROPOSED WATER (W)
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER (SS)
- LIMITS OF CONSTRUCTION (LOC)
- CONSTRUCTION FENCE (CF)
- SILT FENCE (SF)
- INLET PROTECTION (IP)
- CULVERT PROTECTION (CP)
- SEEDING AND MULCHING (SM)
- ROCK SOCK (RS)
- EXISTING STORM SEWER
- AREA OF DRAINAGE DISTURBANCE
- UNDISTURBED AREA

811 Know what's below. Call before you dig.

CALL 3 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MML

HARRIS KOCHER SMITH
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Denver, Colorado 80203
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HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - FINAL - R5 C4

ISSUE DATE: 11-15-2019 | PROJECT #: 190108

DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 80
ES - 80 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - FINAL - 4.DWG | LAYOUT: NAVATNY - R5 C4
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PLOTTED: TIR| 04/01/21 11:05:07A BY: TIM SAVLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH.

MATCHLINE - SEE SHEET ES - 77

MATCHLINE - SEE SHEET ES - 80

EX MH (TO REMAIN TYP)

EX ASPHALT PARKING LOT (TO REMAIN)

EX DIRT TRAIL (TO REMAIN TYP)

EX POST (TO REMAIN TYP)

EX CULVERT PIPE (TO REMAIN TYP)

EX FENCE (TO REMAIN TYP)

EX 30' PSCO EASEMENT REC. NO. 531606 (TO REMAIN)

ROCK SOCK (TO BE REMOVED AFTER CONSTRUCTION TYP)

SILT FENCE (TO BE REMOVED AFTER CONSTRUCTION TYP)

LOT 1 BLOCK 2 REDTAIL RIDGE SUBDIVISION FILING NO 1

TRACT E REDTAIL RIDGE SUBIVISION FILING NO 1

PR 10' UTILITY ESMT

PR 30' UTILITY ESMT

CULVERT PROTECTION (TO BE REMOVED AFTER CONSTRUCTION)

NORTHWEST PKWY
VARIABLE WIDTH ROW

STOCK PILE AREA AND SILT FENCE (TO BE REMOVED AFTER CONSTRUCTION)

PR LOT LINE (TYP)

INLET PROTECTION (TO BE REMOVED AFTER CONSTRUCTION TYP)

EX 10' IRRIGATION EASEMENT REC. NO. 3046683 (TO BE VACATED)

PR FH (TYP)

PR STM MAIN (TYP)

PR 12' SW

EX STM (TO REMAIN TYP)

PR LANDSCAPE ESMT (VARIABLE WIDTH)

PR STREET LIGHT (TYP)

PR SS MAIN (TYP)

PR 120' ROW

ROCKCRESS DR
(120' ROW)

PR 30' UTILITY ESMT

PR STM MH (TYP)

PR SS MH (TYP)

PR STM INLET (TYP)

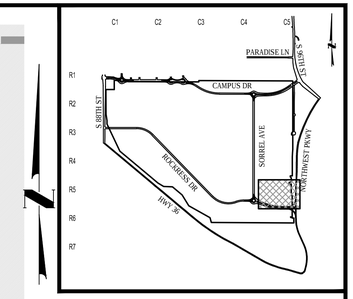
PR FIRE HYDRANT (TYP)

CONSTRUCTION FENCE (TO BE REMOVED AFTER CONSTRUCTION)

PR 10' DRY UTILITY ESMT

PR SS

MATCHLINE - SEE SHEET ES - 84



KEY MAP
1"=2000'

NOTES:

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- PROPOSED CONTOURS (5264, 5265)
- EXISTING WATER LINE (W)
- EXISTING STORM MAIN (ST)
- EXISTING SANITARY SEWER (SS)
- EXISTING UNDERGROUND ELECTRIC (UE, E)
- EXISTING UNDERGROUND TELECOM (UT)
- PROPOSED WATER (W)
- PROPOSED STORM SEWER (ST)
- PROPOSED SANITARY SEWER (SS)
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- CONSTRUCTION FENCE (CF)
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40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MML

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BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - FINAL - R5 C5

ISSUE DATE: 11-15-2019 | PROJECT #: 190108

DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

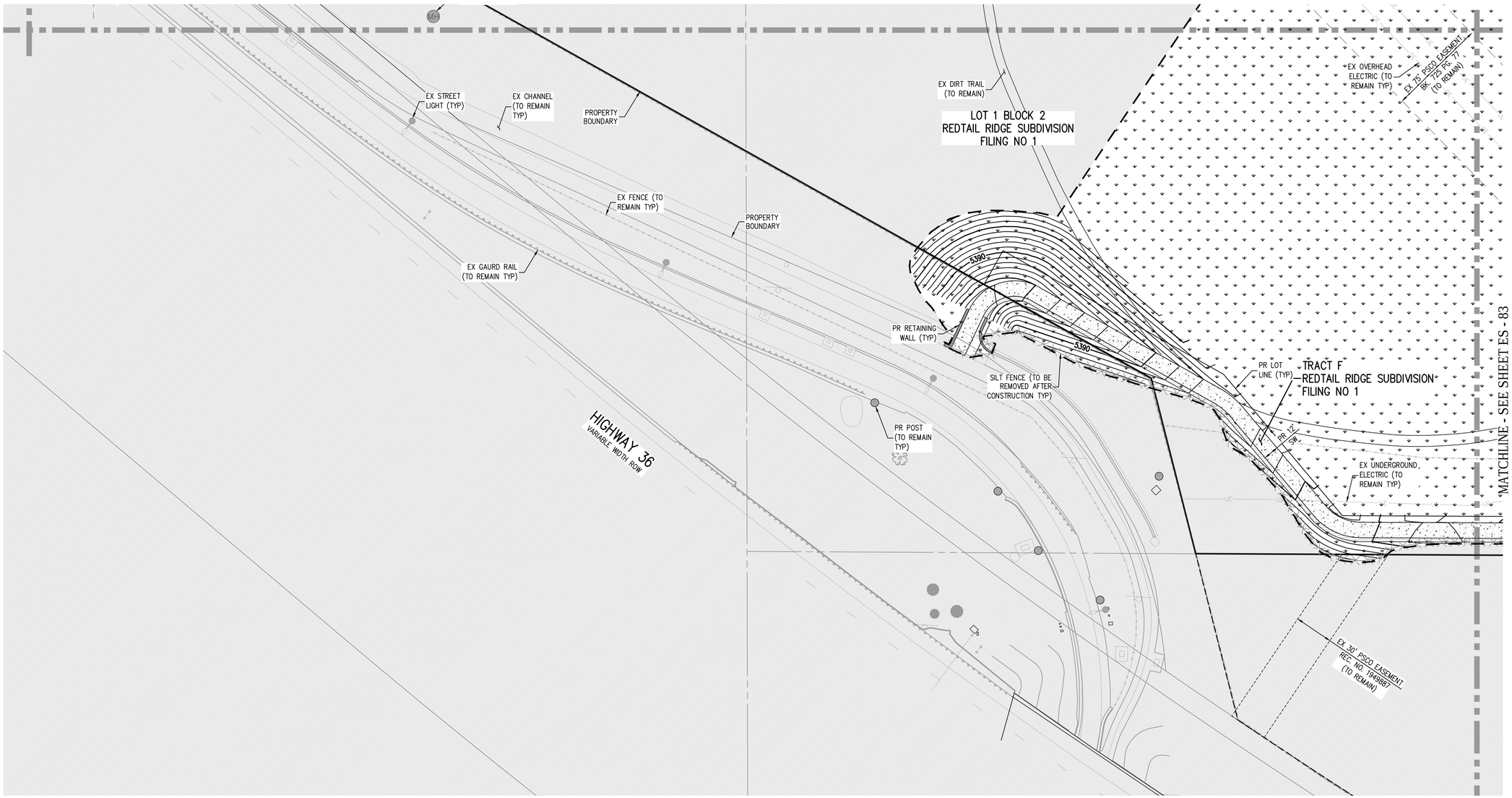
PRELIMINARY NOT FOR CONSTRUCTION

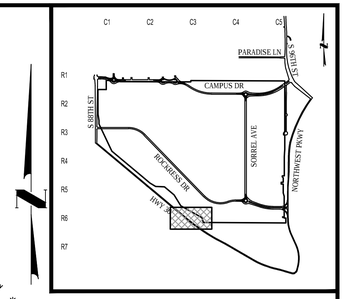
SHEET NO.
ES - 81
ES - 81 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - FINAL - 4.DWG LAYOUT: NAVAJO TYN - R5 C5
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PLOTTED: THU 04/01/21 11:05:23A BY: TIM SAVIER

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MATCHLINE - SEE SHEET ES - 79





KEY MAP
1"=2000'

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40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MML

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BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - FINAL - R6 C3

ISSUE DATE: 11-15-2019	PROJECT #: 190108
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

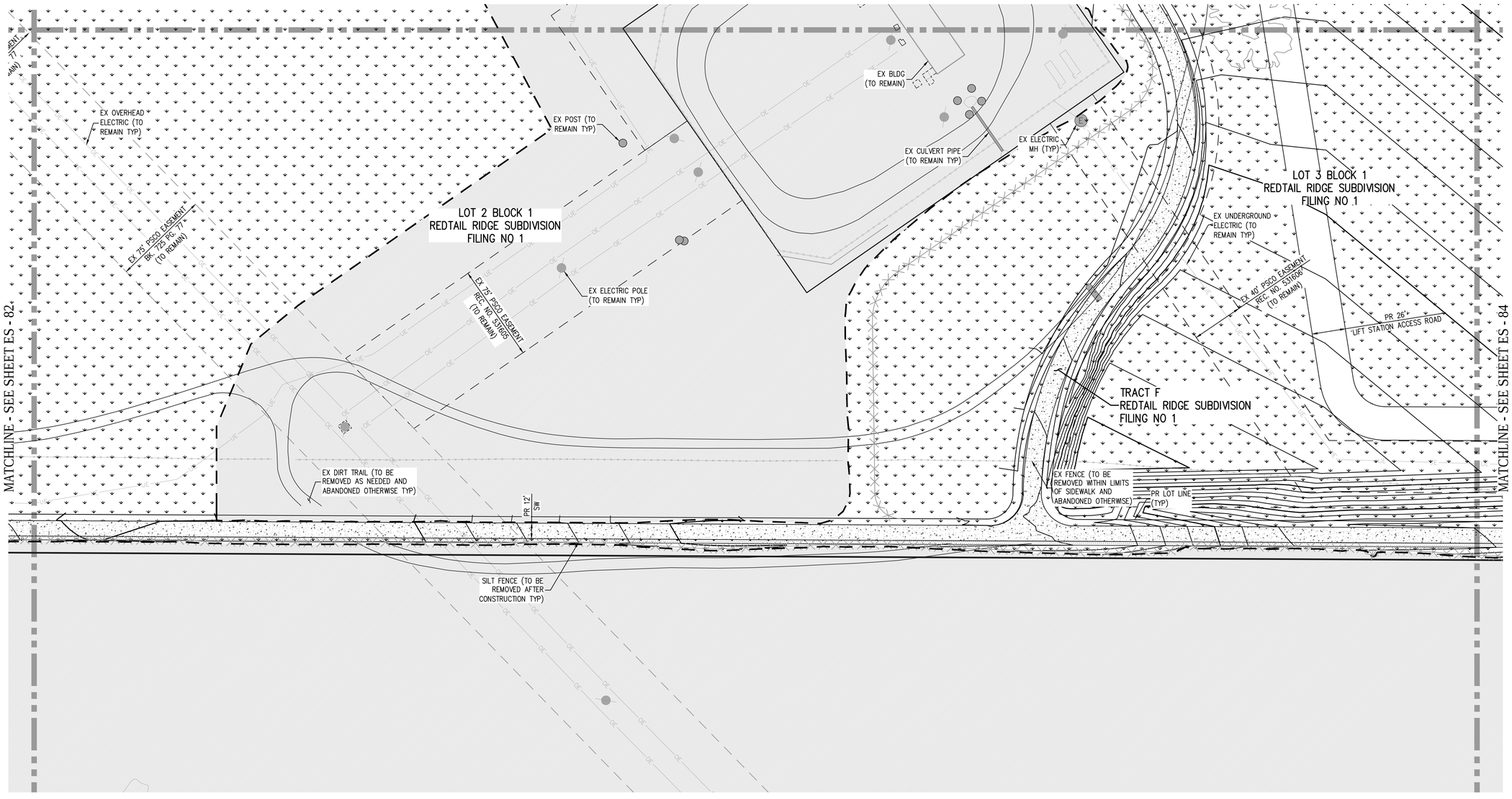
PRELIMINARY NOT FOR CONSTRUCTION

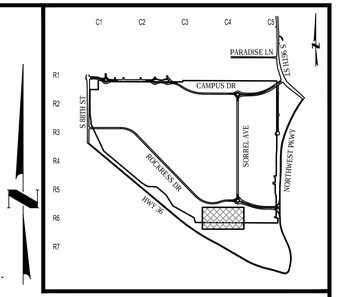
SHEET NO.
ES - 82
ES - 82 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP_FINAL_4.DWG LAYOUT: NAVATNY - R6 C3
12 XREFs: client logo, e-base, e-legal, e-util, key map, p-base-f1, p-base-f2[1], p-base-land-f1, p-legal-f1, p-legal-f2[1], p-util-f1, stamp - swmp
PLOTTED: THU 04/01/21 11:05:37A BY: TIM SAYLER

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MATCHLINE - SEE SHEET ES - 80





KEY MAP
1"=2000'

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- EXISTING SANITARY SEWER (SS)
- EXISTING UNDERGROUND ELECTRIC (UE)
- EXISTING UNDERGROUND TELECOM (UT)
- PROPOSED WATER (W)
- PROPOSED STORM SEWER (ST)
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- LIMITS OF CONSTRUCTION (LOC)
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SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MML

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BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - FINAL - R6 C4

ISSUE DATE: 11-15-2019 | PROJECT #: 190108

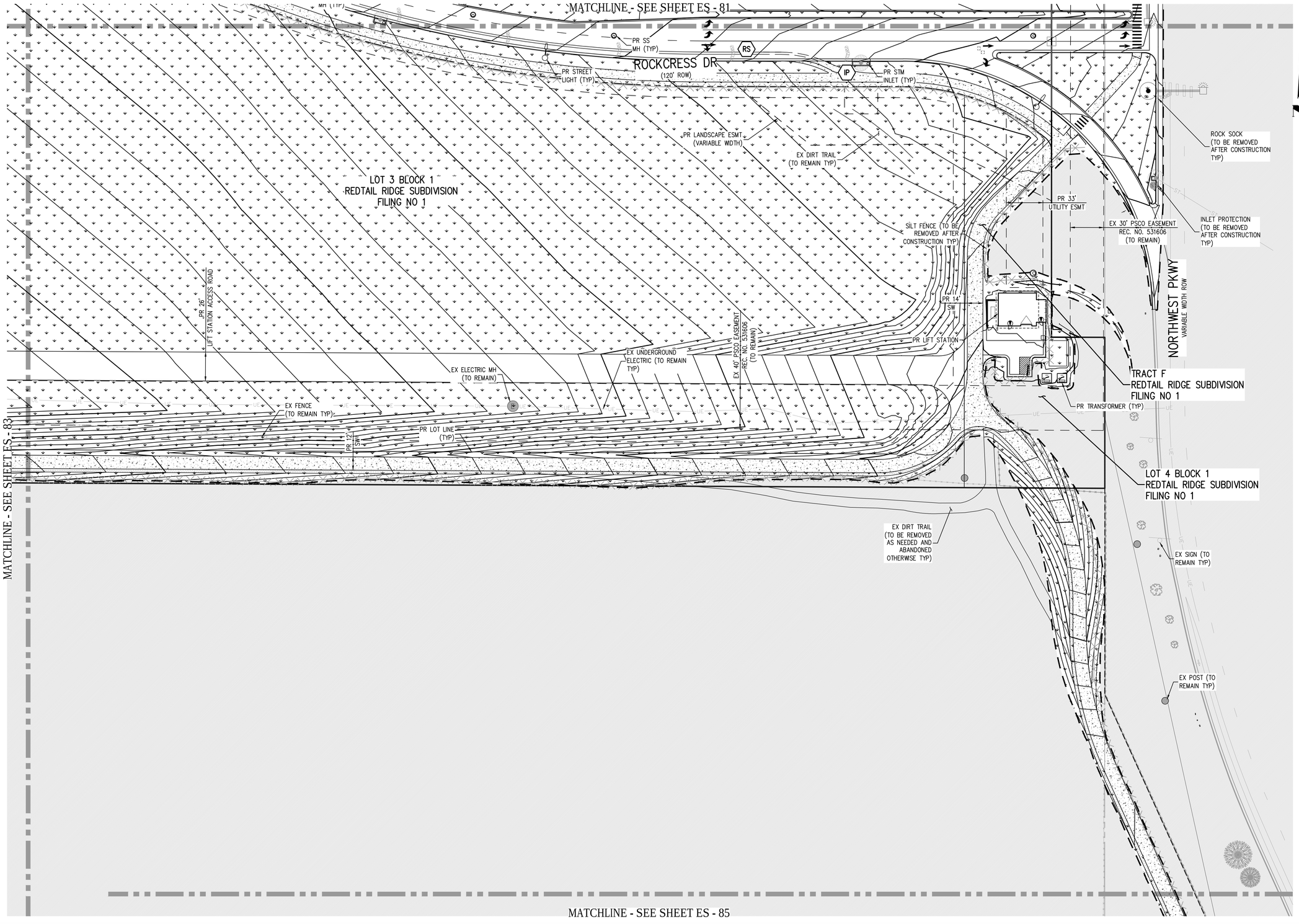
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

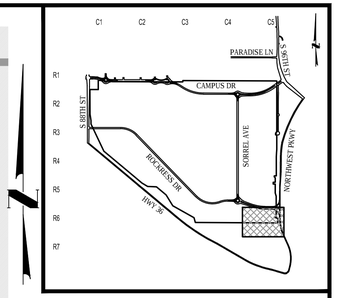
PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 83
ES - 83 OF ES - 91

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PLOTTED: THU 04/01/21 11:05:52A BY: TIM SAYLER

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KEY MAP
1"=2000'

NOTES:

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LEGEND:

- RIGHT-OF-WAY
- 5258 / 5260 EXISTING CONTOURS
- 5264 / 5265 PROPOSED CONTOURS
- W EXISTING WATER LINE
- ST EXISTING STORM MAIN
- SS EXISTING SANITARY SEWER
- UE EXISTING UNDERGROUND ELECTRIC
- UT EXISTING UNDERGROUND TELECOM
- W PROPOSED WATER
- PROPOSED STORM SEWER
- SS PROPOSED SANITARY SEWER
- LOC LIMITS OF CONSTRUCTION
- CF CONSTRUCTION FENCE
- SF SILT FENCE
- IP INLET PROTECTION
- CIP CULVERT PROTECTION
- SW SEEDING AND MULCHING
- RS ROCK SOCK
- EXISTING STORM SEWER
- AREA OF DRAINAGE DISTURBANCE
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40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MML

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HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - FINAL - R6 C5

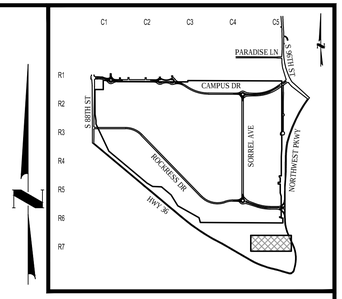
ISSUE DATE: 11-15-2019	PROJECT #: 190108
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 84
ES - 84 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - FINAL - 4.DWG LAYOUT: NAWATNY - R6 C5
12 XREFs: client logo, e-base, e-legal, e-util, key map, p-base-1, p-base-12[U], p-base-ann[F], p-legal-1, p-legal-12[U], p-util-1, stamp - swmp
PLOTTED: THU 04/01/21 11:06:07A BY: TIM SAYLER

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KEY MAP
1"=2000'

MATCHLINE - SEE SHEET ES - 56



NOTES:

1. ALL EXISTING SURFACE FEATURES NOT INCLUDED WITHIN FILING NO. 1 ARE TO REMAIN UNLESS OTHERWISE NOTED. SEE SHEETS MASTER UTILITY AND SURFACE IMPROVEMENTS PLAN FOR PHASING.
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LEGEND:

- RIGHT-OF-WAY
- 5258 5260 EXISTING CONTOURS
- 5264 5265 PROPOSED CONTOURS
- W EXISTING WATER LINE
- ST EXISTING STORM MAIN
- SS EXISTING SANITARY SEWER
- UE E EXISTING UNDERGROUND ELECTRIC
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40 0 40 80
SCALE: 1" = 40'

DESIGNED BY: TJS
CHECKED BY: MSM
DRAWN BY: MML

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Denver, Colorado 80203
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HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - FINAL - R7 C5

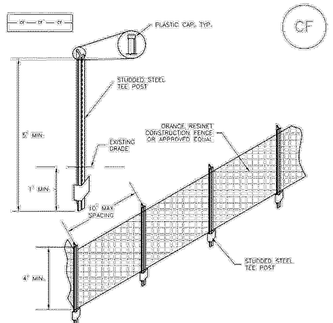
ISSUE DATE: 11-15-2019	PROJECT #: 190108
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 85
ES - 85 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - FINAL - 4.DWG LAYOUT: NAVATNY - R7 C5
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PLOTTED: TIR| 04/01/21 11:06:28A BY: TIM SAVLER

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CF–1. PLASTIC MESH CONSTRUCTION FENCE

CONSTRUCTION FENCE INSTALLATION NOTES

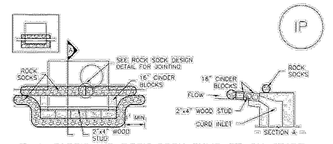
1. SEE PLAN VIEW FOR:
   –LOCATION OF CONSTRUCTION FENCE.
2. CONSTRUCTION FENCE SHOWN SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.
3. CONSTRUCTION FENCE SHALL BE COMPOSED OF ORANGE, CONTRACTOR–GRADE MATERIAL THAT IS AT LEAST 4' HIGH. METAL POSTS SHOULD HAVE A PLASTIC CAP FOR SAFETY.
4. STUDDED STEEL TEE POSTS SHALL BE UTILIZED TO SUPPORT THE CONSTRUCTION FENCE. MAXIMUM SPACING FOR STEEL TEE POSTS SHALL BE 10'.
5. CONSTRUCTION FENCE SHALL BE SECURELY FASTENED TO THE TOP, MIDDLE, AND BOTTOM OF EACH POST.

CONSTRUCTION FENCE MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.
2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.
4. CONSTRUCTION FENCE SHALL BE REPAIRED OR REPLACED WHEN THERE ARE SIGNS OF DAMAGE SUCH AS TIPS OR SAGS. CONSTRUCTION FENCE IS TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION.
5. WHEN CONSTRUCTION FENCES ARE REMOVED, ALL DISTURBED AREAS ASSOCIATED WITH THE INSTALLATION, MAINTENANCE, AND/OR REMOVAL OF THE FENCE SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED, OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION.

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

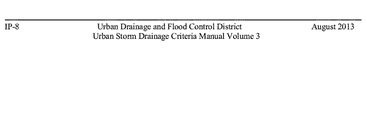
(DETAIL ADAPTED FROM TOWN OF PARKER, COLORADO, NOT AVAILABLE IN AUTOCAD)



IP–1. BLOCK AND ROCK SOCK SUMP OR ON GRADE INLET PROTECTION

BLOCK AND CURB SOCK INLET PROTECTION INSTALLATION NOTES

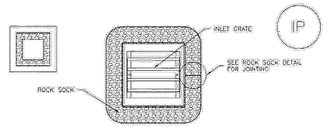
1. SEE ROCK SOCK DESIGN DETAIL FOR INSTALLATION REQUIREMENTS.
2. CONCRETE "CINDER" BLOCKS SHALL BE LAID ON THEIR SIDES AROUND THE INLET IN A SINGLE ROW, ABUTTING ONE ANOTHER WITH THE OPEN END FACING AWAY FROM THE CURB.
3. GRAVEL (NCE SHALL BE PLACED AROUND CONCRETE BLOCKS, CLOSELY ABUTTING ONE ANOTHER AND JOINTED TOGETHER IN ACCORDANCE WITH ROCK SOCK DESIGN DETAIL.



IP–2. CURB ROCK SOCKS UPSTREAM OF INLET PROTECTION

CURB ROCK SOCK INLET PROTECTION INSTALLATION NOTES

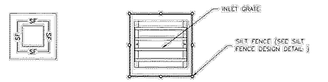
1. SEE ROCK SOCK DESIGN DETAIL INSTALLATION REQUIREMENTS.
2. PLACEMENT OF THE SOCK SHALL BE APPROXIMATELY 30 DEGREES FROM PERPENDICULAR IN THE OPPOSITE DIRECTION OF FLOW.
3. SOCKS ARE TO BE FLUSH WITH THE CURB AND SPACED A MINIMUM OF 5 FEET APART.
4. AT LEAST TWO CURB SOCKS IN SERIES ARE REQUIRED UPSTREAM OF ON–GRADE INLETS.



IP–3. ROCK SOCK SUMP/AREA INLET PROTECTION

ROCK SOCK SUMP/AREA INLET PROTECTION INSTALLATION NOTES

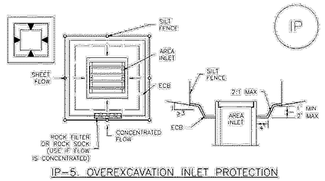
1. SEE ROCK SOCK DESIGN DETAIL FOR INSTALLATION REQUIREMENTS.
2. STRAW WATTLES/SEDIMENT CONTROL LOGS MAY BE USED IN PLACE OF ROCK SOCKS FOR INLETS IN PERVIOUS AREAS. INSTALL PER SEDIMENT CONTROL LOG DETAIL.



IP–4. SILT FENCE FOR SUMP INLET PROTECTION

SILT FENCE INLET PROTECTION INSTALLATION NOTES

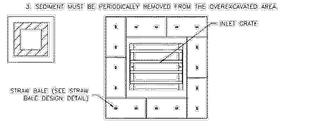
1. SEE SILT FENCE DESIGN DETAIL FOR INSTALLATION REQUIREMENTS.
2. POSTS SHALL BE PLACED AT EACH CORNER OF THE INLET AND AROUND THE EDGES AT A MAXIMUM SPACING OF 3 FEET.
3. STRAW WATTLES/SEDIMENT CONTROL LOGS MAY BE USED IN PLACE OF SILT FENCE FOR INLETS IN PERVIOUS AREAS. INSTALL PER SEDIMENT CONTROL LOG DETAIL.



IP–5. OVEREXCAVATION INLET PROTECTION

OVEREXCAVATION INLET PROTECTION INSTALLATION NOTES

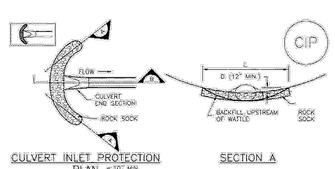
1. THIS FORM OF INLET PROTECTION IS PRIMARILY APPLICABLE FOR SITES THAT HAVE NOT YET REACHED FINAL GRADE AND SHOULD BE USED ONLY FOR INLETS WITH A RELATIVELY SMALL CONTRIBUTING DRAINAGE AREA.
2. WHEN USING FOR CONCENTRATED FLOWS, SHAPE BASIN IN 2:1 RATIO WITH LENGTH ORIENTED TOWARDS DIRECTION OF FLOW.
3. SEDIMENT MUST BE PERIODICALLY REMOVED FROM THE OVEREXCAVATED AREA.



IP–6. STRAW BALE FOR SUMP INLET PROTECTION

STRAW BALE BARRIER INLET PROTECTION INSTALLATION NOTES

1. SEE STRAW BALE DESIGN DETAIL FOR INSTALLATION REQUIREMENTS.
2. BALES SHALL BE PLACED IN A SINGLE ROW AROUND THE INLET WITH ENDS OF BALES TIGHTLY ABUTTING ONE ANOTHER.



CULVERT INLET PROTECTION PLAN



SECTION A

CIP–1. CULVERT INLET PROTECTION

CULVERT INLET PROTECTION INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   –LOCATION OF CULVERT INLET PROTECTION.
2. SEE ROCK SOCK DESIGN DETAIL FOR ROCK GRADATION REQUIREMENTS AND JOINTING DETAIL.

CULVERT INLET PROTECTION MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.
2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.
4. SEDIMENT ACCUMULATED UPSTREAM OF THE CULVERT SHALL BE REMOVED WHEN THE SEDIMENT DEPTH IS ½ THE HEIGHT OF THE ROCK SOCK.
5. CULVERT INLET PROTECTION SHALL REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS PERMANENTLY STABILIZED AND APPROVED BY THE LOCAL JURISDICTION.

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

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

GENERAL INLET PROTECTION INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   –LOCATION OF INLET PROTECTION.
   –TYPE OF INLET PROTECTION (IP–1, IP–2, IP–3, IP–4, IP–5, IP–6)
2. INLET PROTECTION SHALL BE INSTALLED PROMPTLY AFTER INLET CONSTRUCTION OR PAVING IS COMPLETE (TYPICALLY WITHIN 48 HOURS). IF A RAINFALL/RUNOFF EVENT IS FORECAST, INSTALL INLET PROTECTION PRIOR TO ONSET OF EVENT.
3. MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

INLET PROTECTION MAINTENANCE NOTES

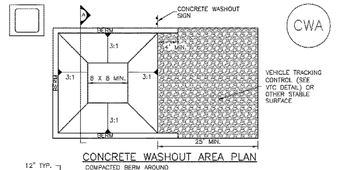
1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.
2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.
4. SEDIMENT ACCUMULATED UPSTREAM OF INLET PROTECTION SHALL BE REMOVED AS NECESSARY TO MAINTAIN BMP EFFECTIVENESS, TYPICALLY WHEN STORAGE VOLUME REACHES 50% OF CAPACITY, A DEPTH OF 6" WHEN SILT FENCE IS USED, OR ¼ OF THE HEIGHT FOR STRAW BALES.
5. INLET PROTECTION IS TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS PERMANENTLY STABILIZED, UNLESS THE LOCAL JURISDICTION APPROVES EARLIER REMOVAL OF INLET PROTECTION IN STREETS.
6. WHEN INLET PROTECTION AT AREA INLETS IS REMOVED, THE DISTURBED AREA SHALL BE COVERED WITH TOP SOIL, SEEDED AND MULCHED, OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

(DETAIL ADAPTED FROM TOWN OF PARKER, COLORADO AND CITY OF AURORA, COLORADO, NOT AVAILABLE IN AUTOCAD)

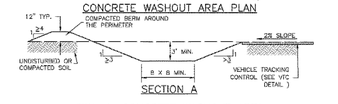
NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

NOTE: THE DETAILS INCLUDED WITH THIS FACT SHEET SHOW COMMONLY USED, CONVENTIONAL METHODS OF INLET PROTECTION IN THE DENVER METROPOLITAN AREA. THERE ARE MANY PROPRIETARY INLET PROTECTION METHODS ON THE MARKET. UDFCD NEITHER ENDORSES NOR DISCOURAGES USE OF PROPRIETARY INLET PROTECTION. HOWEVER, IN THE EVENT PROPRIETARY METHODS ARE USED, THE APPROPRIATE DETAIL FROM THE MANUFACTURER MUST BE INCLUDED IN THE SWMP AND THE BMP MUST BE INSTALLED AND MAINTAINED AS SHOWN IN THE MANUFACTURER'S DETAILS.

NOTE: SOME MUNICIPALITIES DISCOURAGE OR PROHIBIT THE USE OF STRAW BALES FOR INLET PROTECTION. CHECK WITH LOCAL JURISDICTION TO DETERMINE IF STRAW BALE INLET PROTECTION IS ACCEPTABLE.



CONCRETE WASHOUT AREA PLAN



SECTION A

CWA–1. CONCRETE WASHOUT AREA

CWA INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   –CWA INSTALLATION LOCATION.
2. DO NOT LOCATE AN UNLINED CWA WITHIN 400' OF ANY NATURAL DRAINAGE PATHWAY OR WATERBODY. DO NOT LOCATE WITHIN 1,000' OF ANY WELLS OR DRINKING WATER SOURCES. IF SITE CONSTRAINTS MAKE THIS INFEASIBLE, OR IF HIGHLY PERMEABLE SOILS EXIST ON SITE, THE CWA MUST BE INSTALLED WITH AN IMPERMEABLE LINER (16 MIL MIN. THICKNESS) OR SURFACE STORAGE ALTERNATIVES USING PREFABRICATED CONCRETE WASHOUT DEVICES OR A LINED ABOVE GROUND STORAGE ARE SHOULD BE USED.
3. THE CWA SHALL BE INSTALLED PRIOR TO CONCRETE PLACEMENT ON SITE.
4. CWA SHALL INCLUDE A FLAT SUBSURFACE PIT THAT IS AT LEAST 8' BY 8' SLOPES LEADING OUT OF THE SUBSURFACE PIT SHALL BE 3:1 OR FLATTER. THE PIT SHALL BE AT LEAST 3' DEEP.
5. BERM SURROUNDING SIDES AND BACK OF THE CWA SHALL HAVE MINIMUM HEIGHT OF 1'.
6. VEHICLE TRACKING PAD SHALL BE SLOPED 2% TOWARDS THE CWA.
7. SIGNS SHALL BE PLACED AT THE CONSTRUCTION ENTRANCE, AT THE CWA, AND ELSEWHERE AS NECESSARY TO CLEARLY INDICATE THE LOCATION OF THE CWA TO OPERATORS OF CONCRETE TRUCKS AND PUMP RIGS.
8. USE EXCAVATED MATERIAL FOR PERIMETER BERM CONSTRUCTION.

811 Know what's below. Call before you dig.

CALL 3 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

DESIGNED BY: EDL
CHECKED BY: MSM
DRAWN BY: EDL

HKS HARRIS KOCHER SMITH
1120 Lincoln Street, Suite 1000
Denver, Colorado 80203
P: 303.623.6300 F: 303.623.6311
HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - DETAILS

ISSUE DATE: 11-15-2019	PROJECT #: 190108
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 86
ES - 86 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - DETAILS.DWG LAYOUT: LAYOUT1
NO XREFS
PLOTTED: TIR/ 04/01/21 11:06:46A BY: TIM SAYLER

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MM-1 Concrete Washout Area (CWA)

CWA MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. THE CWA SHALL BE REPAIRED, CLEANED, OR ENLARGED AS NECESSARY TO MAINTAIN CAPACITY FOR CONCRETE WASTE. CONCRETE MATERIALS ACCUMULATED IN PIT, SHALL BE REMOVED ONCE THE MATERIALS HAVE REACHED A DEPTH OF 2'.

5. 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.

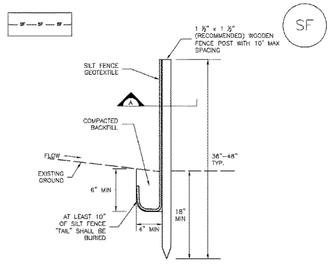
6. THE CWA SHALL REMAIN IN PLACE UNTIL ALL CONCRETE FOR THE PROJECT IS PLACED.

7. WHEN THE CWA IS REMOVED, COVER THE DISTURBED AREA WITH TOP SOIL, SEED AND MULCH OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

(DETAIL ADAPTED FROM DOUGLAS COUNTY, COLORADO AND THE CITY OF PARKER, COLORADO, NOT AVAILABLE IN AUTOCAD)

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

Silt Fence (SF) SC-1



SILT FENCE



SECTION A

SF-1. SILT FENCE

SC-1 Silt Fence (SF)

SILT FENCE INSTALLATION NOTES

1. SILT FENCE MUST BE PLACED AWAY FROM THE TOE OF THE SLOPE TO ALLOW FOR WATER PONDING. SILT FENCE AT THE TOE OF A SLOPE SHOULD BE INSTALLED IN A FLAT LOCATION AT LEAST SEVERAL FEET (2-5 FT) FROM THE TOE OF THE SLOPE TO ALLOW ROOM FOR PONDING AND DEPOSITION.

2. A UNIFORM 6" X 4" ANCHOR TRENCH SHALL BE EXCAVATED USING TRENCHER OR SILT FENCE INSTALLATION DEVICE. NO ROAD GRADERS, BACKHOES, OR SIMILAR EQUIPMENT SHALL BE USED.

3. COMPACT ANCHOR TRENCH BY HAND WITH A "JUMPING JACK" OR BY WHEEL ROLLING. COMPACTION SHALL BE SUCH THAT SILT FENCE RESISTS BEING PULLED OUT OF ANCHOR TRENCH BY HAND.

4. SILT FENCE SHALL BE PULLED TIGHT AS IT IS ANCHORED TO THE STAKES. THERE SHOULD BE NO NOTICEABLE SAG BETWEEN STAKES AFTER IT HAS BEEN ANCHORED TO THE STAKES.

5. SILT FENCE FABRIC SHALL BE ANCHORED TO THE STAKES USING 1" HEAVY DUTY STAPLES OR NAILS WITH 1" HEADS. STAPLES AND NAILS SHOULD BE PLACED 3" ALONG THE FABRIC DOWN THE STAKES.

6. AT THE END OF A RUN OF SILT FENCE ALONG A CONTOUR, THE SILT FENCE SHOULD BE TURNED PERPENDICULAR TO THE CONTOUR TO CREATE A "J-HOOK." THE "J-HOOK" EXTENDING PERPENDICULAR TO THE CONTOUR SHOULD BE OF SUFFICIENT LENGTH TO KEEP RUNOFF FROM FLOWING AROUND THE END OF THE SILT FENCE (TYPICALLY 10' - 20').

7. SILT FENCE SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.

SILT FENCE MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. SEDIMENT ACCUMULATED UPSTREAM OF THE SILT FENCE SHALL BE REMOVED AS NEEDED TO MAINTAIN THE FUNCTIONALITY OF THE BMP, TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY ½ OF THE HEIGHT OF THE SEDIMENT CONTROL LOG.

5. REPAIR OR REPLACE SILT FENCE WHEN THERE ARE SIGNS OF WEAR, SUCH AS SAGGING, TEARING, OR COLLAPSE.

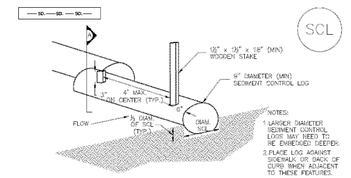
6. SILT FENCE IS TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION, OR IS REPLACED BY AN EQUIVALENT PERIMETER SEDIMENT CONTROL BMP.

7. WHEN SILT FENCE IS REMOVED, ALL DISTURBED AREAS SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION.

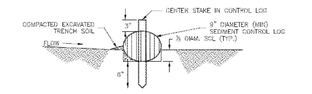
(DETAIL ADAPTED FROM TOWN OF PARKER, COLORADO AND CITY OF AURORA, NOT AVAILABLE IN AUTOCAD)

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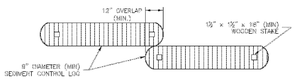
Sediment Control Log (SCL) SC-2



TRENCHED SEDIMENT CONTROL LOG



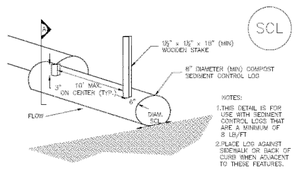
SECTION (A)
TRENCHED SEDIMENT CONTROL LOG



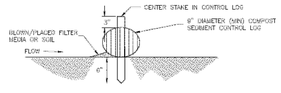
LOG JOINTS

SCL-1. TRENCHED SEDIMENT CONTROL LOG

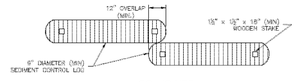
SC-2 Sediment Control Log (SCL)



COMPOST SEDIMENT CONTROL LOG (WEIGHTED)



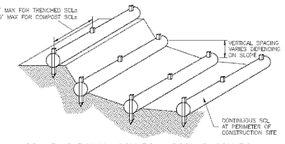
SECTION (A)
COMPOST SEDIMENT CONTROL LOG



LOG JOINTS

SCL-2. COMPOST SEDIMENT CONTROL LOG (WEIGHTED)

Sediment Control Log (SCL) SC-2



SCL-3. SEDIMENT CONTROL LOGS TO CONTROL SLOPE LENGTH

SC-2 Sediment Control Log (SCL)

SEDIMENT CONTROL LOG INSTALLATION NOTES

1. SEE PLAN VIEW FOR LOCATION AND LENGTH OF SEDIMENT CONTROL LOGS.

2. SEDIMENT CONTROL LOGS THAT ACT AS A PERIMETER CONTROL SHALL BE INSTALLED PRIOR TO ANY UPGRADIENT LAND-DISTURBING ACTIVITIES.

3. SEDIMENT CONTROL LOGS SHALL CONSIST OF STRAW, COMPOST, EXCELSIOR OR COCONUT FIBER, AND SHALL BE FREE OF ANY NOXIOUS WEED SEEDS OR DEFECTS INCLUDING RIPS, HOLES AND OBVIOUS WEAR.

4. SEDIMENT CONTROL LOGS MAY BE USED AS SMALL CHECK DAMS IN DITCHES AND SWALES. HOWEVER, THEY SHOULD NOT BE USED IN PERENNIAL STREAMS.

5. IT IS RECOMMENDED THAT SEDIMENT CONTROL LOGS BE TRENCHED INTO THE GROUND TO A DEPTH OF APPROXIMATELY ⅓ OF THE DIAMETER OF THE LOG. IF TRENCHING TO THIS DEPTH IS NOT FEASIBLE AND/OR DESIRABLE (SHORT TERM INSTALLATION WITH DESIRE NOT TO DAMAGE LANDSCAPE) A LESSER TRENCHING DEPTH MAY BE ACCEPTABLE WITH MORE ROBUST STAKING. COMPOST LOGS THAT ARE 8 LB/FT DO NOT NEED TO BE TRENCHED.

6. THE UPHILL SIDE OF THE SEDIMENT CONTROL LOG SHALL BE BACKFILLED WITH SOIL OR FILTER MATERIAL THAT IS FREE OF ROCKS AND DEBRIS. THE SOIL SHALL BE TIGHTLY COMPACTED INTO THE SHAPE OF A RIGHT TRIANGLE USING A SHOVEL OR WEIGHTED LAWN ROLLER OR BLOWN IN PLACE.

7. FOLLOW MANUFACTURERS' GUIDANCE FOR STAKING. IF MANUFACTURERS' INSTRUCTIONS DO NOT SPECIFY SPACING, STAKES SHALL BE PLACED ON 4' CENTERS AND EMBEDDED A MINIMUM OF 6" INTO THE GROUND. 3" OF THE STAKE SHALL PROTRUDE FROM THE TOP OF THE LOG. STAKES THAT ARE BROKEN PRIOR TO INSTALLATION SHALL BE REPLACED. COMPOST LOGS SHOULD BE STAKED 10' ON CENTER.

SEDIMENT CONTROL LOG MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

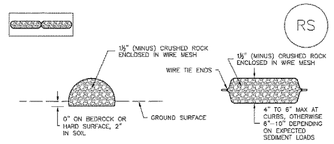
4. SEDIMENT ACCUMULATED UPSTREAM OF SEDIMENT CONTROL LOG SHALL BE REMOVED AS NEEDED TO MAINTAIN FUNCTIONALITY OF THE BMP, TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY ½ OF THE HEIGHT OF THE SEDIMENT CONTROL LOG.

5. SEDIMENT CONTROL LOG SHALL BE REMOVED AT THE END OF CONSTRUCTION.COMPOST FROM COMPOST LOGS MAY BE LEFT IN PLACE AS LONG AS BAGS ARE REMOVED AND THE AREA SEEDED. IF DISTURBED AREAS EXIST AFTER REMOVAL, THEY SHALL BE COVERED WITH TOP SOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

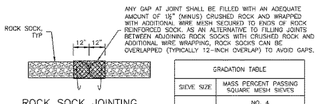
(DETAILS ADAPTED FROM TOWN OF PARKER, COLORADO, JEFFERSON COUNTY, COLORADO, DOUGLAS COUNTY, COLORADO, AND CITY OF AURORA, COLORADO, NOT AVAILABLE IN AUTOCAD)

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

SC-5 Rock Sock (RS)



ROCK SOCK SECTION ROCK SOCK PLAN



ROCK SOCK JOINTING

GRADATION TABLE	
SIEVE SIZE	MASS PERCENT PASSING SQUARE MESH SIEVES
	NO. 4
2"	100
1½"	90 - 100
1"	20 - 55
¾"	0 - 15
⅜"	0 - 5
MATCHES SPECIFICATIONS FOR NO. 4 COARSE AGGREGATE FOR CONCRETE PER AASHTO M43. ALL ROCK SHALL BE FRACTURED FACE, ALL SIDES.	

ROCK SOCK INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   -LOCATION(S) OF ROCK SOCKS.

2. CRUSHED ROCK SHALL BE 1½" (MINUS) IN SIZE WITH A FRACTURED FACE (ALL SIDES) AND SHALL COMPLY WITH GRADATION SHOWN ON THIS SHEET (1½" MINUS).

3. WIRE MESH SHALL BE FABRICATED OF 10 GAGE POULTRY MESH, OR EQUIVALENT, WITH A MAXIMUM OPENING OF ½", RECOMMENDED MINIMUM ROLL WIDTH OF 48"

4. 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.

5. SOME MUNICIPALITIES MAY ALLOW THE USE OF FILTER FABRIC AS AN ALTERNATIVE TO WIRE MESH FOR THE ROCK ENCLOSURE.

RS-1. ROCK SOCK PERIMETER CONTROL

811 Know what's below. Call before you dig.
CALL 3 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

DESIGNED BY: EDL
CHECKED BY: MSM
DRAWN BY: EDL

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BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - DETAILS

ISSUE DATE: 11-15-2019	PROJECT #: 190108
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 87
ES - 87 OF ES - 91

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ROCK SOCK MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. ROCK SOCKS SHALL BE REPLACED IF THEY BECOME HEAVILY SOILED, OR DAMAGED BEYOND REPAIR.

5. SEDIMENT ACCUMULATED UPSTREAM OF ROCK SOCKS SHALL BE REMOVED AS NEEDED TO MAINTAIN FUNCTIONALITY OF THE BMP, TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY ½ OF THE HEIGHT OF THE ROCK SOCK.

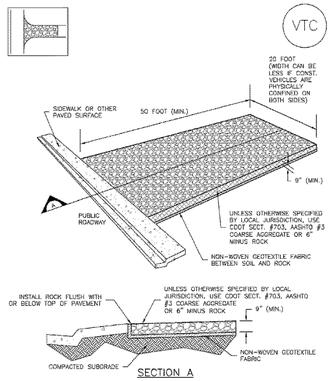
6. ROCK SOCKS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION.

7. WHEN ROCK SOCKS ARE REMOVED, ALL DISTURBED AREAS SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION.

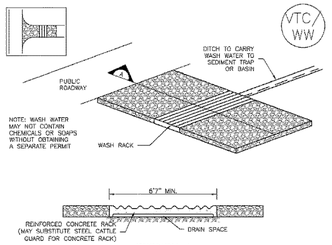
(DETAIL ADAPTED FROM TOWN OF PARKER, COLORADO AND CITY OF AURORA, COLORADO, NOT AVAILABLE IN AUTOCAD)

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

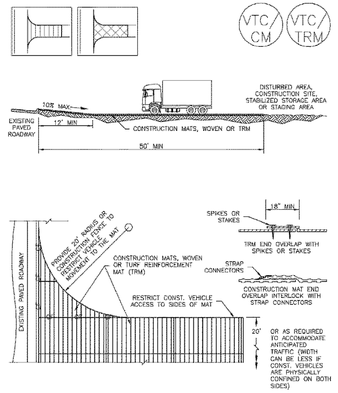
NOTE: THE DETAILS INCLUDED WITH THIS FACT SHEET SHOW COMMONLY USED, CONVENTIONAL METHODS OF ROCK SOCK INSTALLATION IN THE DENVER METROPOLITAN AREA. THERE ARE MANY OTHER SIMILAR PROPRIETARY PRODUCTS ON THE MARKET. UDFCD NEITHER ENDORSES NOR DISCOURAGES USE OF PROPRIETARY PROTECTION PRODUCTS; HOWEVER, IN THE EVENT PROPRIETARY METHODS ARE USED, THE APPROPRIATE DETAIL FROM THE MANUFACTURER MUST BE INCLUDED IN THE SWMP AND THE BMP MUST BE INSTALLED AND MAINTAINED AS SHOWN IN THE MANUFACTURER'S DETAILS.



VTC–1. AGGREGATE VEHICLE TRACKING CONTROL



VTC–2. AGGREGATE VEHICLE TRACKING CONTROL WITH WASH RACK



VTC–3. VEHICLE TRACKING CONTROL W/ CONSTRUCTION MAT OR TURF REINFORCEMENT MAT (TRM)

STABILIZED CONSTRUCTION ENTRANCE/EXIT INSTALLATION NOTES

1. SEE PLAN VIEW FOR
   –LOCATION OF CONSTRUCTION ENTRANCE(S)/EXIT(S).
   –TYPE OF CONSTRUCTION ENTRANCE(S)/EXIT(S) (WITH/WITHOUT WHEEL WASH, CONSTRUCTION MAT OR TRM).

2. CONSTRUCTION MAT OR TRM STABILIZED CONSTRUCTION ENTRANCES ARE ONLY TO BE USED ON SHORT DURATION PROJECTS (TYPICALLY RANGING FROM A WEEK TO A MONTH) WHERE THERE WILL BE LIMITED VEHICULAR ACCESS.

3. A STABILIZED CONSTRUCTION ENTRANCE/EXIT SHALL BE LOCATED AT ALL ACCESS POINTS WHERE VEHICLES ACCESS THE CONSTRUCTION SITE FROM PAVED RIGHT-OF-WAYS.

4. STABILIZED CONSTRUCTION ENTRANCE/EXIT SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.

5. A NON-WOVEN GEOTEXTILE FABRIC SHALL BE PLACED UNDER THE STABILIZED CONSTRUCTION ENTRANCE/EXIT PRIOR TO THE PLACEMENT OF ROCK.

6. UNLESS OTHERWISE SPECIFIED BY LOCAL JURISDICTION, ROCK SHALL CONSIST OF DOT SECT. #703, AASHTO #3 COARSE AGGREGATE OR 6" (MINUS) ROCK.

STABILIZED CONSTRUCTION ENTRANCE/EXIT MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

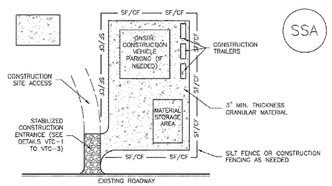
3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. ROCK SHALL BE REAPPLIED OR REGRADED AS NECESSARY TO THE STABILIZED ENTRANCE/EXIT TO MAINTAIN A CONSISTENT DEPTH.

5. SEDIMENT TRACKED ONTO PAVED ROADS IS TO BE REMOVED THROUGHOUT THE DAY AND AT THE END OF THE DAY BY SHOVELING OR SWEEPING. SEDIMENT MAY NOT BE WASHED DOWN STORM SEWER DRAINS.

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

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



SSA–1. STABILIZED STAGING AREA

STABILIZED STAGING AREA INSTALLATION NOTES

1. SEE PLAN VIEW FOR
   –LOCATION OF STAGING AREA(S).
   –CONTRACTOR MAY ADJUST LOCATION AND SIZE OF STAGING AREA WITH APPROVAL FROM THE LOCAL JURISDICTION.

2. STABILIZED STAGING AREA SHOULD BE APPROPRIATE FOR THE NEEDS OF THE SITE. OVERSIZING RESULTS IN A LARGER AREA TO STABILIZE FOLLOWING CONSTRUCTION.

3. STAGING AREA SHALL BE STABILIZED PRIOR TO OTHER OPERATIONS ON THE SITE.

4. THE STABILIZED STAGING AREA SHALL CONSIST OF A MINIMUM 3" THICK GRANULAR MATERIAL.

5. UNLESS OTHERWISE SPECIFIED BY LOCAL JURISDICTION, ROCK SHALL CONSIST OF DOT SECT. #703, AASHTO #3 COARSE AGGREGATE OR 6" (MINUS) ROCK.

6. ADDITIONAL PERIMETER BMPs MAY BE REQUIRED INCLUDING BUT NOT LIMITED TO SILT FENCE AND CONSTRUCTION FENCING.

STABILIZED STAGING AREA MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. ROCK SHALL BE REAPPLIED OR REGRADED AS NECESSARY IF RUTTING OCCURS OR UNDERLYING SUBGRADE BECOMES EXPOSED.

STABILIZED STAGING AREA MAINTENANCE NOTES

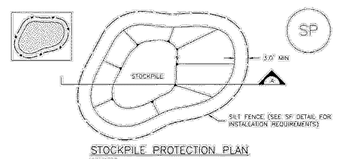
5. STABILIZED STAGING AREA SHALL BE ENLARGED IF NECESSARY TO CONTAIN PARKING, STORAGE, AND UNLOADING/LOADING OPERATIONS.

6. THE STABILIZED STAGING AREA SHALL BE REMOVED AT THE END OF CONSTRUCTION. THE GRANULAR MATERIAL SHALL BE REMOVED OR, IF APPROVED BY THE LOCAL JURISDICTION, USED ON SITE, AND THE AREA COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY LOCAL JURISDICTION.

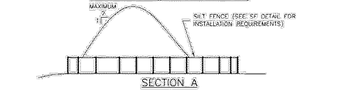
NOTE: MANY MUNICIPALITIES PROHIBIT THE USE OF RECYCLED CONCRETE AS GRANULAR MATERIAL FOR STABILIZED STAGING AREAS DUE TO DIFFICULTIES WITH RE-ESTABLISHMENT OF VEGETATION IN AREAS WHERE RECYCLED CONCRETE WAS PLACED.

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

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



STOCKPILE PROTECTION PLAN



SECTION A

SP–1. STOCKPILE PROTECTION

STOCKPILE PROTECTION INSTALLATION NOTES

1. SEE PLAN VIEW FOR
   –LOCATION OF STOCKPILES.
   –TYPE OF STOCKPILE PROTECTION.

2. INSTALL PERIMETER CONTROLS IN ACCORDANCE WITH THEIR RESPECTIVE DESIGN DETAILS. SILT FENCE IS SHOWN IN THE STOCKPILE PROTECTION DETAILS; HOWEVER, OTHER TYPES OF PERIMETER CONTROLS INCLUDING SEDIMENT CONTROL LOGS OR ROCK SOCKS MAY BE SUITABLE IN SOME CIRCUMSTANCES. CONSIDERATIONS FOR DETERMINING THE APPROPRIATE TYPE OF PERIMETER CONTROL FOR A STOCKPILE INCLUDE WHETHER THE STOCKPILE IS LOCATED ON A PERVIOUS OR IMPERVIOUS SURFACE, THE RELATIVE HEIGHTS OF THE PERIMETER CONTROL AND STOCKPILE, THE ABILITY OF THE PERIMETER CONTROL TO CONTAIN THE STOCKPILE WITHOUT FAILING IN THE EVENT THAT MATERIAL FROM THE STOCKPILE SHIFTS OR SLUMPS AGAINST THE PERIMETER, AND OTHER FACTORS.

3. STABILIZE THE STOCKPILE SURFACE WITH SURFACE ROUGHENING, TEMPORARY SEEDING AND MULCHING, EROSION CONTROL BLANKETS, OR SOIL BINDERS. SOILS STOCKPILED FOR AN EXTENDED PERIOD (TYPICALLY FOR MORE THAN 60 DAYS) SHOULD BE SEEDED AND MULCHED WITH A TEMPORARY GRASS COVER ONCE THE STOCKPILE IS PLACED (TYPICALLY WITHIN 14 DAYS). USE OF MULCH ONLY OR A SOIL BINDER IS ACCEPTABLE IF THE STOCKPILE WILL BE IN PLACE FOR A MORE LIMITED TIME PERIOD (TYPICALLY 30–60 DAYS).

4. FOR TEMPORARY STOCKPILES ON THE INTERIOR PORTION OF A CONSTRUCTION SITE WHERE OTHER DOWNGRADIENT CONTROLS, INCLUDING PERIMETER CONTROLS, ARE IN PLACE, STOCKPILE PERIMETER CONTROLS MAY NOT BE REQUIRED.

811 Know what's below. Call before you dig.

CALL 3 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

DESIGNED BY: EDL
CHECKED BY: MSM
DRAWN BY: EDL

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HarrisKocherSmith.com

BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - DETAILS

ISSUE DATE: 11-15-2019	PROJECT #: 190108
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 88
ES - 88 OF ES - 91

FILEPATH: P:\190108\ENGINEERING\EROSION\SWMP - DETAILS.DWG LAYOUT: LAYOUT3
NO XREFS
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NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF HARRIS KOCHER SMITH

MM-2 Stockpile Management (SM)

STOCKPILE PROTECTION MAINTENANCE NOTES:

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

STOCKPILE PROTECTION MAINTENANCE NOTES:

4. IF PERIMETER PROTECTION MUST BE MOVED TO ACCESS SOIL STOCKPILE, REPLACE PERIMETER CONTROLS BY THE END OF THE WORKDAY.

5. STOCKPILE PERIMETER CONTROLS CAN BE REMOVED ONCE ALL THE MATERIAL FROM THE STOCKPILE HAS BEEN USED.

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

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

Street Sweeping and Vacuuming (SS) SM-7

Description

Street sweeping and vacuuming remove sediment that has been tracked onto roadways to reduce sediment transport into storm drain systems or a surface waterway.



Photograph SS-1. A street sweeper removes sediment and potential pollutants along the curb line at a construction site. Photo courtesy of Tom Gore

Appropriate Uses

Use this practice at construction sites where vehicles may track sediment offsite onto paved roadways.

Design and Installation

Street sweeping or vacuuming should be conducted when there is noticeable sediment accumulation on roadways adjacent to the construction site. Typically, this will be concentrated at the entrance/exit to the construction site. Well-maintained stabilized construction entrances, vehicle tracking controls and tire wash facilities can help reduce the necessary frequency of street sweeping and vacuuming.

On smaller construction sites, street sweeping can be conducted manually using a shovel and broom. Never wash accumulated sediment on roadways into storm drains.

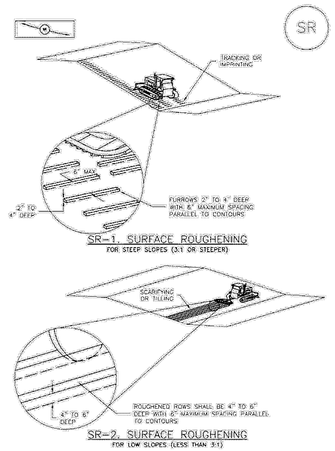
Maintenance and Removal

- Inspect paved roads around the perimeter of the construction site on a daily basis and more frequently, as needed. Remove accumulated sediment, as needed.
- Following street sweeping, check inlet protection that may have been displaced during street sweeping.
- Inspect area to be swept for materials that may be hazardous prior to beginning sweeping operations.

Street Sweeping/ Vacuuming

Functions	
Erosion Control	No
Sediment Control	Yes
Site/Material Management	Yes

Surface Roughening (SR) EC-1



EC-1 Surface Roughening (SR)

SURFACE ROUGHENING INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   - LOCATION(S) OF SURFACE ROUGHENING.

2. SURFACE ROUGHENING SHALL BE PROVIDED PROMPTLY AFTER COMPLETION OF FINISHED GRADING (FOR AREAS NOT RECEIVING TOPSOIL) OR PRIOR TO TOPSOIL PLACEMENT OR ANY FORECASTED RAIN EVENT.

3. AREAS WHERE BUILDING FOUNDATIONS, PAVEMENT, OR SOD WILL BE PLACED WITHOUT DELAY IN THE CONSTRUCTION SEQUENCE, SURFACE ROUGHENING IS NOT REQUIRED.

4. DISTURBED SURFACES SHALL BE ROUGHENED USING RIPPING OR TILLING EQUIPMENT ON THE CONTOUR OR TRACKING UP AND DOWN A SLOPE USING EQUIPMENT TREADS.

5. A FARMING DISK SHALL NOT BE USED FOR SURFACE ROUGHENING.

SURFACE ROUGHENING MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACE UPON DISCOVERY OF THE FAILURE.

4. VEHICLES AND EQUIPMENT SHALL NOT BE DRIVEN OVER AREAS THAT HAVE BEEN SURFACE ROUGHENED.

5. IN NON-TURF GRASS FINISHED AREAS, SEEDING AND MULCHING SHALL TAKE PLACE DIRECTLY OVER SURFACE ROUGHENED AREAS WITHOUT FIRST SMOOTHING OUT THE SURFACE.

6. IN AREAS NOT SEEDED AND MULCHED AFTER SURFACE ROUGHENING, SURFACES SHALL BE RE-ROUGHENED AS NECESSARY TO MAINTAIN GROOVE DEPTH AND SMOOTH OVER RILL EMISSION.

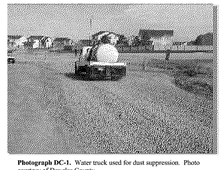
(DETAILS ADAPTED FROM TOWN OF PARKER, COLORADO, NOT AVAILABLE IN AUTOCAD)

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

Wind Erosion/Dust Control (DC) EC-14

Description

Wind erosion and dust control BMPs help to keep soil particles from entering the air as a result of land disturbing construction activities. These BMPs include a variety of practices generally focused on either graded disturbed areas or construction roadways. For graded areas, practices such as seeding and mulching, use of soil binders, site watering, or other practices that provide prompt surface cover should be used. For construction roadways, road watering and stabilized surfaces should be considered.



Photograph DC-1. Water truck used for dust suppression. Photo courtesy of Douglas County.

Appropriate Uses

Dust control measures should be used on any site where dust poses a problem to air quality. Dust control is important to control for the health of construction workers and surrounding waterbodies.

Design and Installation

The following construction BMPs can be used for dust control:

- An irrigation/sprinkler system can be used to wet the top layer of disturbed soil to help keep dry soil particles from becoming airborne.
- Seeding and mulching can be used to stabilize disturbed surfaces and reduce dust emissions.
- Protecting existing vegetation can help to slow wind velocities across the ground surface, thereby limiting the likelihood of soil particles to become airborne.
- Spray-on soil binders form a bond between soil particles keeping them grounded. Chemical treatments may require additional permitting requirements. Potential impacts to surrounding waterways and habitat must be considered prior to use.
- Placing rock on construction roadways and entrances will help keep dust to a minimum across the construction site.
- Wind fences can be installed on site to reduce wind speeds. Install fences perpendicular to the prevailing wind direction for maximum effectiveness.

Wind Erosion Control/ Dust Control

Functions	
Erosion Control	Yes
Sediment Control	No
Site/Material Management	Moderate

Maintenance and Removal

When using an irrigation/sprinkler control system to aid in dust control, be careful not to overwater. Overwatering will cause construction vehicles to track mud off-site.

Sediment Basin (SB) SC-7

Description

A sediment basin is a temporary pond built on a construction site to capture eroded or disturbed soil transported in storm runoff prior to discharge from the site. Sediment basins are designed to capture site runoff and slowly release it to allow time for settling of sediment prior to discharge. Sediment basins are often constructed in locations that will later be modified to serve as post-construction stormwater basins.



Photograph SB-1. Sediment basin at the toe of a slope. Photo courtesy of WWE.

Appropriate Uses

Most large construction sites (typically greater than 2 acres) will require one or more sediment basins for effective management of construction site runoff. On linear construction projects, sediment basins may be impractical; instead, sediment traps or other combinations of BMPs may be more appropriate.

Sediment basins should not be used as stand-alone sediment controls. Erosion and other sediment controls should also be implemented upstream.

When feasible, the sediment basin should be installed in the same location where a permanent post-construction detention pond will be located.

Design and Installation

The design procedure for a sediment basin includes these steps:

- **Basin Storage Volume**: Provide a storage volume of at least 3,600 cubic feet per acre of drainage area. To the extent practical, undisturbed and/or off-site areas should be diverted around sediment basins to prevent "clean" runoff from mixing with runoff from disturbed areas. For undisturbed areas (both on-site and off-site) that cannot be diverted around the sediment basin, provide a minimum of 500 ft^3/acre of storage for undeveloped (but stable) off-site areas in addition to the 3,600 ft^3/acre for disturbed areas. For stable, developed areas that cannot be diverted around the sediment basin, storage volume requirements are summarized in Table SB-1.
- **Basin Geometry:** Design basin with a minimum length-to-width ratio of 2:1 (L:W). If this cannot be achieved because of site space constraints, baffling may be required to extend the effective distance between the inflow point(s) and the outlet to minimize short-circuiting.
- **Dam Embankment**: It is recommended that embankment slopes be 4:1 (H:V) or flatter and no steeper than 3:1 (H:V) in any location.

Sediment Basins

Functions	
Erosion Control	No
Sediment Control	Yes
Site/Material Management	No

SC-7 Sediment Basin (SB)

- **Inflow Structure**: For concentrated flow entering the basin, provide energy dissipation at the point of inflow.

Table SB-1. Additional Volume Requirements for Undisturbed and Developed Tributary Areas Draining through Sediment Basins

Imperviousness (%)	Additional Storage Volume (ft^3) Per Acre of Tributary Area
Undeveloped	500
10	800
20	1230
30	1600
40	2030
50	2470
60	2980
70	3560
80	4360
90	5300
100	6460

- **Outlet Works**: The outlet pipe shall extend through the embankment at a minimum slope of 0.5 percent. Outlet works can be designed using one of the following approaches:
  - **Riser Pipe (Simplified Detail):** Detail SB-1 provides a simplified design for basins treating no more than 15 acres.
  - **Orifice Plate or Riser Pipe**: Follow the design criteria for Full Spectrum Detention outlets in the EDB Fact Sheet provided in Chapter 4 of this manual for sizing of outlet perforations with an emptying time of approximately 72 hours. In lieu of the trash rack, pack uniformly sized 1½ - to 2-inch gravel in front of the plate or surrounding the riser pipe. This gravel will need to be cleaned out frequently during the construction period as sediment accumulates within it. The gravel pack will need to be removed and disposed of following construction to reclaim the basin for use as a permanent detention facility. If the basin will be used as a permanent extended detention basin for the site, a trash rack will need to be installed once contributing drainage areas have been stabilized and the gravel pack and accumulated sediment have been removed.
  - **Floating Skimmer**: If a floating skimmer is used, install it using manufacturer's recommendations. Illustration SB-1 provides an illustration of a Faircloth Skimmer Floating Outlet™, one of the more commonly used floating skimmer outlets. A skimmer should be designed to release the design volume in no less than 48 hours. The use of a floating skimmer outlet can increase the sediment capture efficiency of a basin significantly. A floating outlet continually decants cleanest water off the surface of the pond and releases cleaner water than would discharge from a perforated riser pipe or plate.

Sediment Basin (SB) SC-7

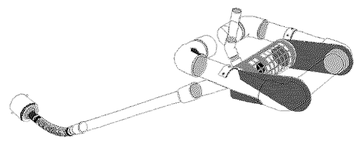


Illustration SB-1. Outlet structure for a temporary sediment basin - Faircloth Skimmer Floating Outlet. Illustration courtesy of J. W. Faircloth & Sons, Inc., FairclothSkimmer.com.

- **Outlet Protection and Spillway:** Consider all flow paths for runoff leaving the basin, including protection at the typical point of discharge as well as overtopping.
  - **Outlet Protection:** Outlet protection should be provided where the velocity of flow will exceed the maximum permissible velocity of the material of the waterway into which discharge occurs. This may require the use of a riprap apron at the outlet location and/or other measures to keep the waterway from eroding.
  - **Emergency Spillway:** Provide a stabilized emergency overflow spillway for rainstorms that exceed the capacity of the sediment basin volume and its outlet. Protect basin embankments from erosion and overtopping. If the sediment basin will be converted to a permanent detention basin, design and construct the emergency spillway(s) as required for the permanent facility. If the sediment basin will not become a permanent detention basin, it may be possible to substitute a heavy polyvinyl membrane or properly bedded rock cover to line the spillway and downstream embankment, depending on the height, slope, and width of the embankments.

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REDTAIL RIDGE FILING NO. 1
SWMP - DETAILS

ISSUE DATE: 11-15-2019 PROJECT #: 190108

DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
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ES - 89 OF ES - 91

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Maintenance and Removal

Maintenance activities include the following:

- Dredge sediment from the basin, as needed to maintain BMP effectiveness, typically when the design storage volume is no more than one-third filled with sediment.
- Inspect the sediment basin embankments for stability and seepage.
- Inspect the inlet and outlet of the basin, repair damage, and remove debris. Remove, clean and replace the gravel around the outlet on a regular basis to remove the accumulated sediment within it and keep the outlet functioning.
- Be aware that removal of a sediment basin may require dewatering and associated permit requirements.
- Do not remove a sediment basin until the upstream area has been stabilized with vegetation.

Final disposition of the sediment basin depends on whether the basin will be converted to a permanent post-construction stormwater basin or whether the basin area will be returned to grade. For basins being converted to permanent detention basins, remove accumulated sediment and reconfigure the basin and outlet to meet the requirements of the final design for the detention facility. If the sediment basin is not to be used as a permanent detention facility, fill the excavated area with soil and stabilize with vegetation.

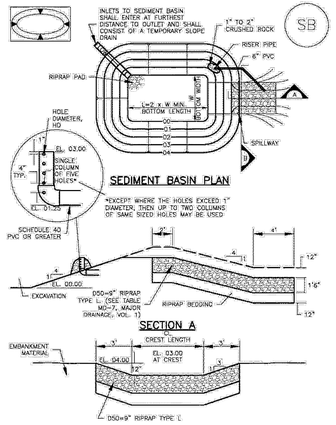


TABLE SB-1, SIZING INFORMATION FOR STANDARD SEDIMENT BASIN

Upstream Drainage Area (rounded to nearest acre), (ac)	Basin Bottom Width (W), (ft)	Spillway Crest Length (CL), (ft)	Hole Diameter (HD), (in)
1	12	2	5/32
2	21	3	7/64
3	28	5	1/8
4	33	6	9/64
5	38	8	5/32
6	43	9	5/32
7	47	11	5/32
8	51	12	3/16
9	55	13	3/16
10	58	15	13/64
11	61	16	7/32
12	64	18	1/4
13	67	19	1 3/4
14	70	21	1 3/4
15	73	22	1 9/16

SEDIMENT BASIN INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   -LOCATION OF SEDIMENT BASIN.
   -TYPE OF BASIN (STANDARD BASIN OR NONSTANDARD BASIN).
   -FOR STANDARD BASIN, BOTTOM WIDTH W, CREST LENGTH CL AND HOLE DIAMETER, HD.
   -FOR NONSTANDARD BASIN, SEE CONSTRUCTION DRAWINGS FOR DESIGN OF BASIN INCLUDING RISER HEIGHT H, NUMBER OF COLUMNS N, HOLE DIAMETER HD AND PIPE DIAMETER D.

2. FOR STANDARD BASIN, BOTTOM DIMENSION MAY BE MODIFIED AS LONG AS BOTTOM AREA IS NOT REDUCED.

3. SEDIMENT BASINS SHALL BE INSTALLED PRIOR TO ANY OTHER LAND-DISTURBING ACTIVITY THAT RELIES ON ON BASINS AS AS A STORMWATER CONTROL.

4. 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.

5. EMBANKMENT MATERIAL SHALL BE COMPACTED TO AT LEAST 95 PERCENT OF MAXIMUM DENSITY IN ACCORDANCE WITH ASTM D698.

6. PIPE SCH 40 OR GREATER SHALL BE USED.

7. 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.

SEDIMENT BASIN MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. SEDIMENT ACCUMULATED IN BASIN SHALL BE REMOVED AS NEEDED TO MAINTAIN BMP EFFECTIVENESS, TYPICALLY WHEN SEDIMENT DEPTH REACHES ONE FOOT (I.E., TWO FEET BELOW THE SPILLWAY CREST).

5. SEDIMENT BASINS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVER IS ACCEPTED BY THE LOCAL JURISDICTION.

6. WHEN SEDIMENT BASINS ARE REMOVED, ALL DISTURBED AREAS SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION.

[DETAILS ADAPTED FROM DOUGLAS COUNTY, COLORADO]

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

Description

Where an actively flowing watercourse must be crossed regularly by construction vehicles, a temporary crossing should be provided. Three primary methods are available:

- Culvert crossing
- Stream ford
- Temporary bridge

Culvert crossings and fords are the most commonly used methods. Due to the expense associated with a temporary bridge, these are used primarily on long-term projects.



Photograph TSC-1. A temporary stream crossing using culverts. Photo courtesy of Tom Gore.

Appropriate Uses

Construction vehicles shall be kept out of waterways to the maximum extent practicable. Use a temporary stream crossing when it is absolutely necessary to cross a stream on a construction site. Construct a temporary crossing even if the stream or drainageway is typically dry. Multiple stream crossings should be avoided to minimize environmental impacts.

A permit is required for placement of fill in a waterway under Section 404 of the Clean Water Act. The local office of the U.S. Army Corps of Engineers (USACE) should be contacted concerning the requirements for obtaining a 404 permit. In addition, a permit from the U.S. Fish and Wildlife Service (USFWS) may be needed if endangered species are of concern in the work area. Typically, the USFWS issues are addressed by a 404 permit, if one is required. The municipality of jurisdiction should also be consulted, and can provide assistance. Other permits to be obtained may include a floodplain development permit from the local jurisdiction.

Design and Installation

Design details are provided for these types of stream crossings:

TSC-1. Culvert Crossing

TSC-2. Ford Crossing

TSC-3. Flume Crossing

Temporary Stream Crossing	
Functions	
Erosion Control	Yes
Sediment Control	Yes
Site/Material Management	No

A culvert crossing should be sized appropriately with consideration for the duration of construction and seasonal variation of flows. The sizing methodology provided in the Temporary Diversion Methods Fact Sheet is also appropriate for determining the design flow for temporary stream crossings. Culvert sizing must account for the headwater and tailwater controls to properly size the culvert. For additional discussion on design of box culverts and pipes, see the *Major Drainage* chapter in Volume 1. The designer also needs to confirm that the riprap selected is appropriate for the conditions in the channel being crossed.

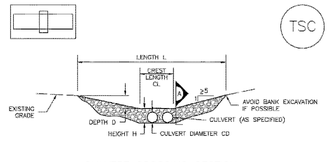
When a ford must be used, namely when a culvert is not practical or the best solution, the ford should be lined with at least a 12-inch thick layer of Type VL (D_{50} = 6 inches) or Type L (D_{50} = 9 inches) riprap with void spaces filled with 1-1/2 inch diameter rock. Ford crossings are recommended primarily for crossings of ephemeral (i.e. intermittently, briefly flowing) streams.

For a temporary bridge crossing, consult with a structural and/or geotechnical engineer for temporary bridge design or consider pre-fabricated alternatives.

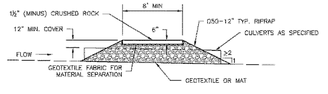
Maintenance and Removal

Inspect stream for bank erosion and in-stream degradation. If bank erosion is occurring, stabilize banks using erosion control practices such as erosion control blankets. If in-stream degradation is occurring, armor the culvert outlet(s) with riprap to dissipate energy. If sediment is accumulating upstream of the crossing, remove excess sediment as needed to maintain the functionality of the crossing.

Remove the temporary crossing when it is no longer needed for construction. Take care to minimize the amount of sediment lost into the stream upon removal. Once the crossing has been removed, stabilize the stream banks with seed and erosion control blankets.

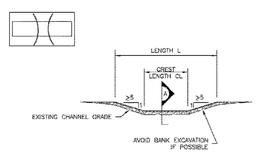


CULVERT CROSSING SECTION

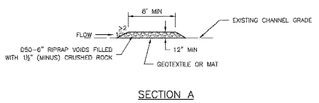


SECTION A

TSC-1. CULVERT CROSSING



FORD CROSSING SECTION



SECTION A

TSC-2. FORD CROSSING

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DRAWN BY: EDL

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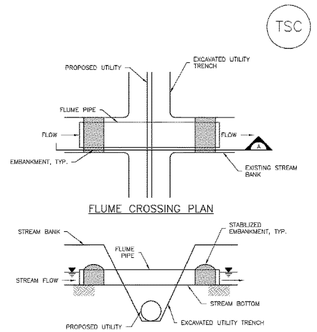
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

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FLUME CROSSING PLAN

SECTION A

TSC-3, FLUME CROSSING

TEMPORARY STREAM CROSSING INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   –LOCATIONS OF TEMPORARY STREAM CROSSINGS.
   –STREAM CROSSING TYPE (FORD, CULVERT, OR FLUME).
   –FOR FORD CROSSING: LENGTH (L), CREST LENGTH (CL), AND DEPTH (D).
   –FOR CULVERT CROSSING: LENGTH (L), CREST LENGTH (CL), CROSSING HEIGHT (H), DEPTH (D), CULVERT DIAMETER (CD), AND NUMBER, TYPE AND CLASS OR GAUGE OF CULVERTS.

2. TEMPORARY STREAM CROSSING DIMENSIONS, D50, AND NUMBER OF CULVERTS INDICATED (FOR CULVERT CROSSING) SHALL BE CONSIDERED MINIMUM DIMENSIONS; ENGINEER MAY ELECT TO INSTALL LARGER FACILITIES. ANY DAMAGE TO STREAM CROSSING OR EXISTING STREAM CHANNEL DURING BASEFLOW OR FLOOD EVENTS SHALL BE PROMPTLY REPAIRED.

3. SEE MAJOR DRAINAGE CHAPTER FOR RIPRAP GRADATIONS.

4. WHERE FAILURE OF A STREAM CROSSING CAN RESULT IN SIGNIFICANT DAMAGE OR HARM IT MUST BE DESIGNED BY A STRUCTURAL ENGINEER.

TEMPORARY STREAM CROSSING MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. REMOVE SEDIMENT ACCUMULATED UPSTREAM OF CROSSING AS NEEDED TO MAINTAIN THE FUNCTIONALITY OF THE CROSSING.

5. STREAM CROSSINGS ARE TO REMAIN IN PLACE UNTIL NO LONGER NEEDED AND SHALL BE REMOVED PRIOR TO THE END OF CONSTRUCTION.

6. WHEN STREAM CROSSINGS ARE REMOVED, THE DISTURBED AREA SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED AND COVERED WITH GEOTEXTILE OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

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

(DETAIL ADAPTED FROM DOUGLAS COUNTY, COLORADO AND CITY OF AURORA, COLORADO (VIA: OSHC), NOT AVAILABLE IN AUTOCAD)

Description

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



Photograph CD-1. Rock check dams in a roadside ditch. Photo courtesy of WWE.

Appropriate Uses

Use as a grade control for temporary drainage ditches or swales until final soil stabilization measures are established upstream and downstream. Check dams can be used on mild or moderately steep slopes. Check dams may be used under the following conditions:

- As temporary grade control facilities along waterways until final stabilization is established.
- Along permanent swales that need protection prior to installation of a non-erodible lining.
- Along temporary channels, ditches or swales that need protection where construction of a non-erodible lining is not practicable.
- Reinforced check dams should be used in areas subject to high flow velocities.

Design and Installation

Place check dams at regularly spaced intervals along the drainage swale or ditch. Check dams heights should allow for pools to develop upstream of each check dam, extending to the downstream toe of the check dam immediately upstream.

When rock is used for the check dam, place rock mechanically or by hand. Do not dump rocks into the drainage channel. Where multiple check dams are used, the top of the lower dam should be at the same elevation as the toe of the upper dam.

When reinforced check dams are used, install erosion control fabric under and around the check dam to prevent erosion on the upstream and downstream sides. Each section of the dam should be keyed in to reduce the potential for washout or undermining. A rock apron upstream and downstream of the dam may be necessary to further control erosion.

Check Dams	
Functions	
Erosion Control	Yes
Sediment Control	Moderate
Site/Material Management	No

Design details with notes are provided for the following types of check dams:

- Rock Check Dams (CD-1)
- Reinforced Check Dams (CD-2)

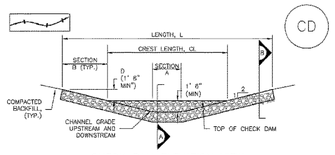
Sediment control logs may also be used as check dams; however, silt fence is not appropriate for use as a check dam. Many jurisdictions also prohibit or discourage use of straw bales for this purpose.

Maintenance and Removal

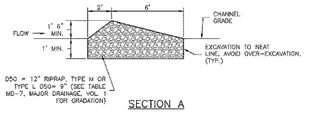
Replace missing rocks causing voids in the check dam. If gravel bags or sandbags are used, replace or repair torn or displaced bags.

Remove accumulated sediment, as needed to maintain BMP effectiveness, typically before the sediment depth upstream of the check dam is within ½ of the crest height. Remove accumulated sediment prior to mulching, seeding, or chemical soil stabilization. Removed sediment can be incorporated into the earthwork with approval from the Project Engineer, or disposed of at an alternate location in accordance with the standard specifications.

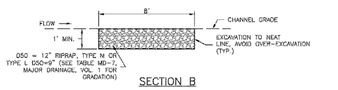
Check dams constructed in permanent swales should be removed when perennial grasses have become established, or immediately prior to installation of a non-erodible lining. All of the rock and accumulated sediment should be removed, and the area seeded and mulched, or otherwise stabilized.



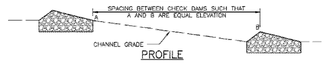
CHECK DAM ELEVATION VIEW



SECTION A



SECTION B



PROFILE

CD-1, CHECK DAM

CHECK DAM INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   –LOCATION OF CHECK DAMS.
   –CHECK DAM TYPE (CHECK DAM OR REINFORCED CHECK DAM).
   –LENGTH (L), CREST LENGTH (CL), AND DEPTH (D).

2. CHECK DAMS INDICATED ON INITIAL SWMP SHALL BE INSTALLED AFTER CONSTRUCTION FENCE, BUT PRIOR TO ANY UPSTREAM LAND DISTURBING ACTIVITIES.

3. RIPRAP UTILIZED FOR CHECK DAMS SHOULD BE OF APPROPRIATE SIZE FOR THE APPLICATION. TYPICAL TYPES OF RIPRAP USED FOR CHECK DAMS ARE TYPE M (D50 12") OR TYPE L (D50 9").

4. RIPRAP PAD SHALL BE TRENCHED INTO THE GROUND A MINIMUM OF 1'.

5. THE ENDS OF THE CHECK DAM SHALL BE A MINIMUM OF 1' 6" HIGHER THAN THE CENTER OF THE CHECK DAM.

CHECK DAM MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

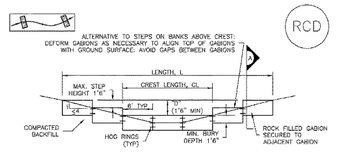
4. SEDIMENT ACCUMULATED UPSTREAM OF THE CHECK DAMS SHALL BE REMOVED WHEN THE SEDIMENT DEPTH IS WITHIN ½ OF THE HEIGHT OF THE CREST.

5. CHECK DAMS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION.

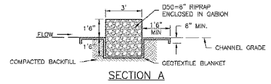
6. WHEN CHECK DAMS ARE REMOVED, EXCAVATIONS SHALL BE FILLED WITH SUITABLE COMPACTED BACKFILL. DISTURBED AREA SHALL BE SEEDED AND MULCHED AND COVERED WITH GEOTEXTILE OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

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

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



REINFORCED CHECK DAM ELEVATION VIEW



SECTION A

REINFORCED CHECK DAM INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   –LOCATIONS OF CHECK DAMS.
   –CHECK DAM TYPE (CHECK DAM OR REINFORCED CHECK DAM).
   –LENGTH (L), CREST LENGTH (CL), AND DEPTH (D).

2. CHECK DAMS INDICATED ON THE SWMP SHALL BE INSTALLED PRIOR TO AN UPSTREAM LAND–DISTURBING ACTIVITIES.

3. REINFORCED CHECK DAMS, GABIONS SHALL HAVE GALVANIZED TWISTED WIRE NETTING WITH A MAXIMUM OPENING DIMENSION OF 4½" AND A MINIMUM WIRE THICKNESS OF 0.10". WIRE "HOG RINGS" AT 4" SPACING OR OTHER APPROVED MEANS SHALL BE USED AT ALL GABION SEAMS AND TO SECURE THE GABION TO THE ADJACENT SECTION.

4. THE CHECK DAM SHALL BE TRENCHED INTO THE GROUND A MINIMUM OF 1' 6".

5. GEOTEXTILE BLANKET SHALL BE PLACED IN THE REINFORCED CHECK DAM TRENCH EXTENDING A MINIMUM OF 1' 6" ON BOTH THE UPSTREAM AND DOWNSTREAM SIDES OF THE REINFORCED CHECK DAM.

CD–2, REINFORCED CHECK DAM

REINFORCED CHECK DAM MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. SEDIMENT ACCUMULATED UPSTREAM OF REINFORCED CHECK DAMS SHALL BE REMOVED AS NEEDED TO MAINTAIN THE EFFECTIVENESS OF BMP, TYPICALLY WHEN THE UPSTREAM SEDIMENT DEPTH IS WITHIN ½ THE HEIGHT OF THE CREST.

5. REPAIR OR REPLACE REINFORCED CHECK DAMS WHEN THERE ARE SIGNS OF DAMAGE SUCH AS HOLES IN THE GABION OR UNDEROUTING.

6. REINFORCED CHECK DAMS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION.

7. WHEN REINFORCED CHECK DAMS ARE REMOVED, ALL DISTURBED AREAS SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED, AND COVERED WITH A GEOTEXTILE BLANKET, OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION.

(DETAIL ADAPTED FROM DOUGLAS COUNTY, COLORADO AND CITY OF AURORA, COLORADO, NOT AVAILABLE IN AUTOCAD)

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

811 Know what's below. Call before you dig.
CALL 3 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

DESIGNED BY: EDL
CHECKED BY: MSM
DRAWN BY: EDL

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BRUE·BAUKOL CAPITAL PARTNERS

REDTAIL RIDGE FILING NO. 1
SWMP - DETAILS

ISSUE DATE: 11-15-2019	PROJECT #: 190108
DATE	REVISION COMMENTS
04-17-2020	SECOND SUBMITTAL PER CITY COMMENTS
04-05-2021	FIRST SUBMITTAL NEW PROGRAM

PRELIMINARY NOT FOR CONSTRUCTION

SHEET NO.
ES - 91
ES - 91 OF ES - 91

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