



**Boulder County Purchasing**  
**1325 Pearl Street**  
**Boulder, CO 80302**  
[purchasing@bouldercounty.gov](mailto:purchasing@bouldercounty.gov)

**INVITATION TO BID**  
**COVER PAGE**

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BID Number:	<b>7496-23</b>
BID Title:	<b>Minor Structure Replacement of Riverside Drive Over Cave Creek</b>
Optional Pre-Bid Meeting:	August 15, 2023 - 10:00 a.m. <b>Microsoft Teams meeting</b> <b>Join on your computer, mobile app or room device</b> <a href="#">Click here to join the meeting</a> Meeting ID: 246 249 466 662 Passcode: etHYRx <b>Or call in (audio only)</b> <a href="#">+1 720-400-7859,,793161237#</a> United States, Denver Phone Conference ID: 793 161 237#
BID Questions Due:	August 21, 2023 – 2:00 p.m.
Submittal Due Date:	August 29, 2023 – 2:00 p.m.
Email Address:	<a href="mailto:purchasing@bouldercounty.gov">purchasing@bouldercounty.gov</a>

Boulder County Public Works – Engineering Division  
BID #7496-23

July 2023

Minor Structure Replacement of Riverside Drive over Cave Creek

Project No. BC-103-009

Documents included in this package:

Bid Instructions  
Terms and Conditions  
Specifications & Plan Set  
Insurance and W-9 Requirements  
Submittal Checklist  
Bid Tab Section  
Signature Page  
Sample Contract  
Army Corps Permit  
Floodplain Development Permit  
Geotechnical Report  
SUE Utility Map



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## **INSTRUCTIONS**

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### **1. Purpose/Background**

Replacing of a cast-in-place concrete slab on stone masonry abutments and wingwalls with a 14'Wx7'H (interior dimensions) concrete box culvert with cast-in-place concrete headwalls, cast-in-place doghouse rail, wingwalls, and toewalls. The project also includes clearing and grubbing, removals (asphalt, structures, signs), excavation and backfill, seeding, mulching, erosion control, dewatering, asphalt patching, riprap, guardrail, construction surveying, striping, and mobilization.

### **2. Optional Pre-Bid Meeting**

An Optional Pre-Bid Meeting will be held on Microsoft Teams **August 15, 2023 at 10:00 a.m.** Please click the link on the cover page or use the call-in number.

### **3. Written Inquiries**

All inquiries regarding this BID will be submitted via email to the Boulder County Purchasing Office at [purchasing@bouldercounty.gov](mailto:purchasing@bouldercounty.gov) on or before 2:00 p.m. **August 21, 2023**. A response from the county to all inquiries will be posted and sent via email no later than **August 24, 2023**.

**Do not contact any other county department or personnel with questions or for information regarding this solicitation.**

#### 4. Submittal Instructions

BIDs are due at the email box only, listed below, for time and date recording on or before **2:00 p.m. Mountain Time on August 29, 2023**. A bid opening will be conducted at 3:00 p.m. via Microsoft Teams. Please click on the link below or use the call-in number. A copy of the bid tab will also be sent to all who have submitted a Bid. **Vendors must answer whether line-item pricing information submitted with a bid is confidential or closely held.**

### Microsoft Teams meeting

**Join on your computer, mobile app or room device**

[Click here to join the meeting](#)

Meeting ID: 238 403 796 834

Passcode: PCwkC5

[Download Teams](#) | [Join on the web](#)

**Or call in (audio only)**

[+1 720-400-7859,,806144456#](#) United States, Denver

Phone Conference ID: 806 144 456#

**Please note that email responses to this solicitation are limited to a maximum of 50MB capacity.**

**NO ZIP FILES OR LINKS TO EXTERNAL SITES WILL BE ACCEPTED. THIS INCLUDES GOOGLE DOCS AND SIMILAR SITES. ALL SUBMITTALS MUST BE RECEIVED AS AN ATTACHMENT (E.G. PDF, WORD, EXCEL).**

**Electronic Submittals must be received in the email box listed below. Submittals sent to any other box will NOT be forwarded or accepted. This email box is only accessed on the due date of your questions or proposals. Please use the Delivery Receipt option to verify receipt of your email. It is the sole responsibility of the proposer to ensure their documents are received before the deadline specified above. Boulder County does not accept responsibility under any circumstance for delayed or failed email or mailed submittals.**

**Email**     [purchasing@bouldercounty.gov](mailto:purchasing@bouldercounty.gov); identified as **BID # 7496-23** in the subject line.

All BIDs must be received and time and date recorded by authorized county staff by the above due date and time. Sole responsibility rests with the bidder to see that their BID

response is received on time at the stated location(s). Any BIDs received after due date and time will be returned to the bidder.

The Board of County Commissioners reserves the right to reject any and all BIDs, to waive any informalities or irregularities therein, and to accept the proposal that, in the opinion of the Board, is in the best interest of the Board and of the County of Boulder, State of Colorado.

Contractors and their employees, subcontractors, and agents must comply with all federal, state, and local laws, regulations, ordinances, orders, and codes, as well as Boulder County policies, guidelines, and protocols.

**Americans with Disabilities Act (ADA):** Americans with Disabilities Act: If you need special services provided for under the Americans with Disabilities Act (ADA), please contact the Boulder County ADA Coordinator or Human Resources office at (303) 441-3525 as soon as possible to allow sufficient time for service delivery ahead of applicable due dates.



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## **TERMS AND CONDITIONS**

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1. Bidders are expected to examine the drawing, specifications, schedule of delivery, and all instructions. Failure to do so will be at the bidder's risk.
  2. Each bidder will furnish the information required in the Invitation to Bid.
  3. The Contract/Purchase Order will be awarded to that responsible bidder whose submittal, conforming to the Invitation to Bid, will be most advantageous to the County of Boulder, based on best value not only price.
  4. The County of Boulder reserves the right to reject any or all bids and to waive informalities and minor irregularities in bids received, and to accept any portion of or all items proposed if deemed in the best interest of the County of Boulder to do so.
  5. No submittal will be withdrawn for a period of thirty (30) days subsequent to the opening of bids without the consent of the County Purchasing Agent or delegated representative.
  6. A signed purchase order or contract furnished to the successful bidder results in a binding contract without further action by either party.
  7. Late or unsigned bids will not be accepted or considered. It is the responsibility of bidders to ensure that the bid arrives at the Purchasing email address prior to the time indicated in the "Invitation to Bid."
  8. The proposed price will be exclusive of any Federal or State taxes from which the County of Boulder is exempt by law.

9. Any interpretation, correction or change of the bid documents will be made by Addendum. Interpretations, corrections and changes of the bid documents made in any other manner will not be binding, and bidder will not rely upon such interpretations, corrections and changes. The County’s Representative will not be responsible for oral clarification.
10. Confidential/Proprietary Information: Bids submitted in response to this “Invitation to Bid” and any resulting contract are subject to the provisions of the Colorado Open Records Act, 24-72-201 et seq., C.R.S., as amended. Any restrictions on the use or inspection of material contained within the bid or resulting contract should be clearly stated in the bid and contract itself. Confidential/proprietary information should be readily identified, marked and/or separated from the rest of the bid. Co-mingling of confidential/proprietary and other information is NOT acceptable. Vendors must answer whether line-item pricing information submitted with a bid is confidential or closely held. Bids that do not identify confidential/proprietary information may be released in their entirety. Pricing totals contained in a bid are not considered confidential.

**The Boulder County Attorney’s Office retains sole authority for determining whether the Colorado Open Records Act requires or permits Boulder County to disclose proposal or bid documents, or any information contained therein, pursuant to an open records request.**

11. Boulder County promotes the purchase/leasing of energy efficient materials and products with low toxicity levels when availability, quality and budget constraints allow. Proposers are expected whenever possible to provide products that earn the ENERGY STAR and meet the ENERGY STAR specifications for energy efficiency with power management features enabled. Proposers are encouraged to offer products and equipment with post-consumer recycled-content materials. Products should be packaged and delivered with a minimum amount of recycled packaging that adequately protects the product but is not excessive.
12. Pursuant to Colorado law (House Bill 1292), in any bidding process for public works in which a bid is received from a non-resident bidder who is from a state that provides a percentage bidding preference, a comparable percentage disadvantage will be applied to the bid of that bidder. Bidders may obtain additional information from the Department of Personnel’s website: <http://www.colorado.gov/dpa/>.

13. Bid Security: Boulder County may require, at its discretion, bid security for construction contracts when the price is expected to exceed \$50,000 and for any other contracts as determined by Boulder County to be in its best interest. Bid security provides assurance to Boulder County that the bidder will, upon award, fulfill its bonding and contracting obligations as required by the instructions to bidders. When bid security is required, as indicated in the instructions to bidders, the following terms apply:
- Bid security must be for an amount equal to 5 percent of the amount bid, unless otherwise stipulated in the instructions to bidders.
  - Bid security must be in the form of a bond, issued by a surety company authorized to do business in Colorado, or a bank cashier's check made payable to Boulder County.
  - Bidders should scan and submit a copy of the bid security instrument with their bid submittal AND mail to Boulder County the actual bid security instrument, postmarked no later than the date of the bid deadline.
  - Bidder noncompliance with bid security requirements requires that the bid be rejected as nonresponsive.
  - The bid security is submitted as a guarantee that the bid will be maintained in full force and effect for a period of thirty (30) days after the opening of the bids. Accordingly, after bids are opened, they shall be irrevocable for a period of thirty (30) days.
  - If a bidder is permitted to withdraw his bid before award, at Boulder County's sole discretion, no action shall be had against the bidder or the bid security.
  - Following award, if a contractor fails to deliver the required performance and payment bonds or refuses to enter into a contract with Boulder County under the terms of its winning bid, the contractor's bid shall be rejected and its bid security will be enforced by Boulder County to the extent of actual damages.





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**SPECIFICATIONS**

**BOULDER COUNTY PUBLIC WORKS – ENGINEERING DIVISION  
 MINOR STRUCTURE REPLACEMENT OF RIVERSIDE DRIVE OVER CAVE CREEK**

The 2022 *Standard Specifications for Road and Bridge Construction* from the Colorado Department of Transportation controls construction of this project. The following special provisions supplement or modify the Standard Specifications and take precedence over the Standard Specifications and plans.

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**BOULDER COUNTY PUBLIC WORKS ENGINEERING DIVISION  
MINOR STRUCTURE REPLACEMENT OF RIVERSIDE DRIVE OVER CAVE CREEK  
Standard Special Provisions Index**

The 2022 *Standard Specifications for Road and Bridge Construction* from the Colorado Department of Transportation controls construction of this project. The following special provisions supplement or modify the Standard Specifications and take precedence over the Standard Specifications and plans.

<b>Name</b>	<b>Revised Date</b>	<b>No. of Pages</b>
Revision of Section 103 – Colorado Resident Bid Preference	(October 1, 2012)	1
Revision of Section 109 – Prompt Payment (Local Agency)	(April 26 2022)	2

### **Commencement and Completion of Work**

The Contractor shall commence work under the Contract on or before the 15<sup>th</sup> day following the Contract execution unless such time for beginning the work is changed by the Project Engineer in the "Notice to Proceed."

The Contractor shall complete all work (excluding punch list items) within 120 working days in accordance with the "Notice to Proceed" and the punch list items shall be completed within 30 working days. Punch list work shall be done efficiently and effectively so as not to unnecessarily delay work.

Work may be suspended for cold or inclement weather that would not allow for asphalt paving or would impact the quality of the final work. No additional payment will be made for remobilization if the project is suspended. If work is suspended, the contractor shall continue coordination with Boulder County Maintenance to insure safe travel of the public through the project site. If the project is suspended for an extended period, the contractor shall leave the project in a state that would not require temporary traffic control during the suspension.

Per the Boulder County Stormwater Quality Permit (SWQP) requirements, no earthwork can occur except that which is required to facilitate the installation of control measures until all control measures have been inspected by the County. Contractor's schedule shall include this process. Working days will not be counted between control measure installation and County inspection.

See Project Special Provision, "Revision to Section 108 Prosecution and Progress" for more information and schedule information for the Salient features on the project.

**Revision of Section 101  
 Definitions and Terms**

Certain terms utilized in the latest edition of the Colorado Department of Transportation Standard Specifications for Road and Bridge Construction shall be interpreted to have different meanings within the scope of this Contract. A summary of redefinitions follows:

**Section 101** of the Standard Specifications is hereby revised for this project as follows:

**Subsection 101.22:** “Contractor” shall mean prefabricator and/or contractor as described in subsection 101.23

**Subsection 101.28:** “Department” shall mean Boulder County, Colorado (where applicable).

**Subsection 101.29:** “Engineer” shall mean County Engineer, Boulder County, Colorado or designated representative (where applicable).

**Subsection 101.36** Holidays shall include:

Additional holidays recognized by Boulder County are:

- New Year’s Eve Day, Starting at Noon, if falls on Tuesday through Thursday
- Full Day New Year’s Eve, only if day falls on Monday.
- President’s Day
- Juneteenth
- Election Day (Even Years)
- Day after Thanksgiving Day
- Christmas Eve, Starting at Noon, if falls on Tuesday through Thursday
- Full Day Christmas Eve, only if day falls on Monday

**Subsection 101.39:** “Laboratory” shall mean Boulder County, Colorado or their designated representative.

**Subsection 101.51:** “Project Engineer” shall mean Boulder County’s duly authorized representative who may be a Boulder County or an employee of a consulting engineer (consultant) under contract to Boulder County (where applicable).

**Subsection 101.51 (a):** “CDOT Project Engineer” shall be replaced with “Project Engineer” within these specifications. When applicable and when these documents reference a CDOT engineer, this reference shall be construed to mean Project Engineer.

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**REVISION OF SECTION 101  
DEFINITIONS AND TERMS**

**Subsection 101.51 (b)** shall be replaced with the following:

*“Consultant Project Engineer”*. The consultant employee under the responsible charge of the consultant’s Professional Engineer who is in direct charge of the work and is responsible for the administration and satisfactory completion of the project. The Consultant Project Engineer’s duties are delegated by the Project Engineer in accordance with the scope of work in the consultant’s contract with Boulder County. The Consultant Project Engineer is not authorized to sign or approve Contract Modification Orders.

**Subsection 101.58** “Region Transportation Director” shall mean Boulder County Engineer, Boulder County, Colorado or designated representative (where applicable).

**Subsection 101.76** “State” shall mean Boulder County, Colorado (where applicable).

**Revision of Section 102  
Project Plans and Other Data**

**Section 102** of the Standard Specifications is hereby revised for this project as follows:

**Subsection 102.05** shall include the following:

Boulder County will provide electronic files of drawings, the sample contract document, the project technical specifications in PDF format, online at the designated internet bid advertisement site, and they will be considered as the official bid set and record set.

**Revision of Section 104  
Maintaining Traffic**

**Section 104** of the Standard Specifications is revised for this project as follows:

**Subsection 104.04** shall include the following:

Employee vehicle parking is prohibited where it conflicts with safety, access or flow of traffic. The Contractor is responsible for obtaining, coordinating and maintaining acceptable parking and staging areas for the duration of the construction activities. This shall not be paid for separately but shall be included in the work.



**Revision Of Section 106  
Control Of Material**

**Section 106** of the Standard Specifications is hereby revised for this project as follows:

**Subsection 106.03** shall include the following:

Sampling and testing will be done in accordance with Boulder County Public Work Department's Minimum Guideline for Sampling and Testing.

The Contractor will be responsible for establishing, documenting, and implementing a Quality Control Plan. The Quality Control Plan shall include all procedures necessary for the Contractor to control the quality of its production processes to meet the requirements of the Contract. The Contractor's Quality Control Plan shall include a testing and inspection schedule to control the production processes.

Boulder County will provide a qualified Construction Quality Assurance team to perform Quality Assurance (QA) testing, auditing, and acceptance testing. The QA staff shall remain independent from the Contractor's production and Quality Control (QC). The Boulder County Construction Inspection team and/or testing firm will perform on-site inspection and testing of the construction elements of the work to verify that all work has been constructed in conformance with the Contract requirements.

**Revision of Section 107**  
**Performance of Safety Critical Work**

**Section 107** of the Standard Specifications is hereby revised as follows:

**Add subsection 107.061** immediately following subsection 107.06 as follows:

**107.061 Performance of Safety Critical Work.**

The following work elements are considered safety critical work for this project:

- (a) Work requiring the use of cranes or other overhead lifting equipment
- (b) Work associated with and including temporary shoring
- (c) Removal of existing bridge deck, substructure, railing, and foundation

The Contractor shall submit, for record purposes only, an initial detailed construction plan that addresses safe construction of each of the safety critical elements. The detailed construction plan shall be submitted two weeks prior to the safety critical element conference described below. The construction plan shall be stamped “Approved for Construction” and signed by the Contractor. The construction plan will not be approved by the Engineer.

The Construction Plan shall include the following:

- (a) Safety Critical Element for which the plan is being prepared and submitted.
- (b) Contractor or subcontractor responsible for the plan preparation and the work.
- (c) Schedule, procedures, equipment, and sequence of operations, that comply with the working hour limitations.
- (d) Temporary works required: falsework, bracing, shoring, etc.
- (e) Additional actions that will be taken to ensure that the work will be performed safely.
- (f) Names and qualifications of workers who will be in responsible charge of the work:
  - (1) Years of experience performing similar work
  - (2) Training taken in performing similar work
  - (3) Certifications earned in performing similar work
- (g) Names and qualifications of workers operating cranes or other lifting equipment
  - (1) Years of experience performing similar work
  - (2) Training taken in performing similar work
  - (3) Certifications earned in performing similar work.

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**REVISION OF SECTION 107  
PERFORMANCE OF SAFETY CRITICAL WORK**

- (h) The construction plan shall address how the Contractor will handle contingencies such as:
- (1) Unplanned events (storms, traffic accidents, etc.)
  - (2) Structural elements that don't fit or line up
  - (3) Work that cannot be completed in time for the roadway to be reopened to traffic
  - (4) Replacement of workers who don't perform the work safely
  - (5) Equipment failure
  - (6) Other potential difficulties inherent in the type of work being performed
- (i) Name and qualifications of Contractor's person designated to determine and notify the Engineer in writing when it is safe to open a route to traffic after it has been closed for safety critical work.

A safety critical element conference shall be held two weeks prior to beginning construction on each safety critical element. The Engineer, the Contractor, the safety critical element subcontractors, and the Contractor's Engineer shall attend the conference.

After the safety critical element conference, and prior to beginning work on the safety critical element, the Contractor shall submit a final construction plan to the Engineer for record purposes only. The Contractor's Engineer shall sign, and seal temporary works related to construction plans for the safety critical elements. The final construction plan shall be stamped "Approved for Construction" and signed by the Contractor.

The Contractor shall perform safety critical work only when the Engineer is on the project site. The Contractor's Engineer shall be on site to inspect and provide written approval of safety critical work for which he provided stamped construction details. Unless otherwise directed or approved, the Contractor's Engineer need not be on site during the actual performance of safety critical work but shall be present to conduct inspection for written approval of the safety critical work.

When ordered by the Engineer, the Contractor shall immediately stop safety critical work that is being performed in an unsafe manner or will result in an unsafe situation for the traveling public. Prior to stopping work, the Contractor shall make the situation safe for work stoppage. The Contractor shall submit an acceptable plan to correct the unsafe process before the Engineer will authorize resumption of the work.

When ordered by the Engineer, the Contractor shall remove workers from the project that are performing the safety critical work in a manner that creates an unsafe situation for the public in accordance with subsection 108.05.

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**REVISION OF SECTION 107  
PERFORMANCE OF SAFETY CRITICAL WORK**

Should an unplanned event occur, or the safety critical operation deviate from the submitted plan, the Contractor shall immediately cease operations on the safety critical element, except for performing any work necessary to ensure worksite safety, and provide proper protection of the work and the traveling public. If the Contractor intends to modify the submitted plan, he shall submit a revised plan to the Engineer prior to resuming operations.

No explosives shall be allowed on or used on the project site.

All costs associated with the preparation and implementation of each safety critical element construction plan will not be measured and paid for separately but shall be included in the work.

Nothing in the section shall be construed to relieve the Contractor from ultimate liability for unsafe or negligent acts or to be a waiver of the Colorado Governmental Immunity Act on behalf of the County.

**Revision of Section 107**  
**Protection and Restoration of Property and Landscape**

**Section 107** of the Standard Specification is hereby revised as follows:

**Subsection 107.12** shall include the following:

The Contractor shall save existing vegetation, except for those that must be removed to accommodate construction of the project. Wetlands that are shown as being temporarily impacted shall be protected and restored to the greatest extent possible.

The Contractor shall perform all the work in such a manner that the least environmental damage will result. Any questionable areas or items shall be brought to the attention of the Engineer for approval prior to vegetation removal or any damaging activity. Damaged or destroyed trees, shrubs, or wetlands, which could have been saved, shall be replaced at the expense of the Contractor.

If any trees or shrubs are to be removed between April 1<sup>st</sup> and August 31<sup>st</sup>, a nesting bird survey must be completed for active nests. The survey will be conducted by the Contractor's designated Wildlife Biologist. If an active nest(s) is found, no work may be done within 50 feet of the nest(s) until Boulder County is notified and further direction of construction limitations have been defined. These requirements are in place to abide by the Migratory Bird Act of 1918.

**Revision of Section 107  
Contractor's Responsibility of Work**

**Section 107** of the Standard Specification is hereby revised as follows:

**Subsection 107.17** shall include the following:

The Contractor shall be responsible for any damage to their work arising from running water from either a natural source or from landscape watering at no additional cost to the contract.

The Contractor shall be responsible for any damages done by the Contractor that is outside the scope of this work.

**Revision of Section 107**  
**Fire Protection Plan**

**Section 107** of the Standard Specifications is hereby revised as follows:

**Subsection 107.18** shall be deleted and replaced with the following:

**107.18 Fire Protection Plan.** The following work elements are considered safety critical work for this project:

- (a) *Fire Protection Plan.* Prior to start of work, the Contractor shall submit a Fire Control Plan in writing to the Engineer and Local Fire Authority for approval. The plan shall include the following:
- (1) The name and contact information of a Fire Control Coordinator who shall be assigned to the project.
  - (2) A 24-hour Emergency Contact List which, at a minimum, includes Project Superintendent, Project Foreman and Project Traffic Control Supervisor.
  - (3) A complete list, including storage locations, of all tools and equipment the Contractor will use in the event of an emergency within project limits.
  - (4) Methods that will be employed if a fire is encountered or started during construction activities within the project limits.
  - (5) Specific fire prevention precautions, and the required fire mitigation equipment, for every activity which has the potential for starting a fire. At a minimum the plan shall address prevention planning related to use of heavy equipment, vehicles, hand tools, storage and parking areas.
  - (6) Specific precautions for fueling operations.
  - (7) Provisions for field safety meetings. The Contractor shall conduct field safety meetings (also known as toolbox or tailgate meetings) at least once per week to include a local Fire Authority Representative. The Contractor shall encourage participation by all persons working at the project site. Participants shall discuss specific fire prevention precautions for construction activities.
- (b) *Open Burn Exemption.* A BURN EXEMPTION may be requested by the Contractor from the Boulder County Sheriff's Office if current fire restrictions are in place. The fire restrictions Prohibit:
- (1) Building, maintaining, attending, or using an open fire, campfire or stove fire (including charcoal barbecues and grills) on public land;
  - (2) Use of all personal fireworks;
  - (3) Shooting or discharging firearms for recreational purposes, except for hunting with a valid and current hunting license on public land;



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**REVISION OF SECTION 107  
FIRE PROTECTION PLAN**

- (4) Smoking, except in an enclosed vehicle or building, a developed recreation site, or while stopped in an area at least three feet in diameter that is barren or cleared of all flammable materials;
- (5) Operating any chainsaw or equipment that produces a spark or flame without a USDA or SAE-approved spark arrester properly installed and in effective working order. A chemical, pressurized fire-extinguisher must be kept with the operator, and at least one round-point shovel with an overall length of at least 35 inches must be readily available for use;
- (6) Welding or operating acetylene or other open-flame torches, except in cleared areas of at least 10 feet in diameter, and with a chemical, pressurized fire-extinguisher immediately available for use; and
- (7) Using an explosive.

(c) *Equipment and Procedures.*

Fire Boxes. If required by the local Fire Authority shall contain tools and equipment that shall be used exclusively for controlling or suppressing fires which occur due to construction activities on project sites. Each fire box shall contain, as a minimum, the following:

- (1) Five round-pointed shovels,
- (2) Two double-bitted axes,
- (3) Three Pulaskis or mattocks,
- (4) Two backpack pumps, and
- (5) Four large fire extinguishers as prescribed by the local Fire Authority.

Welding/Torching/Cutting/Drilling. If work at field locations is required, the work shall be done at a location where all flammable material has been cleared within a 30-foot radius and approved by the local Fire Authority.

Spark Arrestors. All diesel and gasoline powered engines, both mobile and stationary, shall be equipped with serviceable spark arrestors each gasoline power saw shall be provided with a spark screen and a muffler in good condition. Spill-proof metal safety cans shall be used for refueling. Approved and inspected by the local Fire Authority.

Storage and Parking Areas. Batch plant areas, equipment service areas, parking areas, gas and oil drum storage areas, and explosive storage areas shall be cleared of all flammable materials for a distance of 50 feet. Small stationary engine sites shall be cleared of all flammable material for distance of 20 feet. Other mitigation methods may be used as approved by the Engineer and applicable codes.

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**REVISION OF SECTION 107  
FIRE PROTECTION PLAN**

(d) *Fire Control Coordinator Responsibilities.* The Fire Control Coordinator shall:

- (1) Be the primary contact for the local Fire Authority and Project Engineer
- (2) Implement the Fire Control Plan.
- (3) Monitor, manage, and adjust the Fire Control Plan as needed as construction work progresses.
- (4) Document in a letter to the Engineer and Local Fire Authority changes to the Fire Control Plan.
- (5) Contact local firefighting authorities 3 days in advance when a hazardous operation is scheduled. Inspection due to construction activities within project limits may be required.
- (6) Coordinate fire control, mitigation and possible suppression activities until authorities arrive, including the evacuation of staff.

When the Fire Control Coordinator cannot be on the project site, he shall designate a person who is on site to serve as the Fire Control Coordinator. The Fire Control Coordinator, or his designee, shall always be on site while work is performed.

(e) *Open Burning During Weather Events.* **During any of the following weather events, open burning is not permitted in unincorporated Boulder County from time of issuance until midnight in which the event expires: Red Flag Warning, High Wind Warning, High Wind Watch and Fire Danger Warning.** Check the local forecast for up to date information issued by the National Weather Service. This is per Boulder County Ordinance 2018-1, “An Ordinance Repealing and Replacing Boulder County Ordinance 2006-2 and Authorizing the Declaration of Open Fire Bans by the Board of County Commissioners or the County Sheriff.”

The National Weather Service issues weather statements to inform area firefighting and land use management agencies that conditions are ideal for wildland fire ignition and propagation (Red Flag Warning, High Wind Warning, High Wind Watch, Fire Danger Warning).

For this standard special provision, smoking is an open flame and shall be included in the definition of open burning, which is not permitted for the above listed weather events. Any smoking or lighting of items outside or within a vehicle with open windows is not permitted on the project site or within 500 feet of the project’s limits of disturbance. With the approval of the Engineer, who consults with the local Fire Authority, a designated smoking area may be established.

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**REVISION OF SECTION 107  
FIRE PROTECTION PLAN**

No additional payment or compensation will be paid to the Contractor during any weather events associated with open burning and include Red Flag Warning, High Wind Warning, High Wind Watch, Fire Danger Warning. Delays may be counted as an excusable delay per Standard Specification 108.08 or at the discretion of the Engineer.

- (f) *Costs.* All costs associated with the preparation and implementation of the Plan and compliance with all fire protection provisions and requirements will not be measured and paid for separately but shall be included in the work.

**Revision of Section 107  
Air Quality Control**

**Section 107** of the Standard Specifications is hereby revised for this project as follows:

**Subsection 107.24, Air Quality Control**, shall include the following:

*Equipment Emissions.* Boulder County projects shall meet or exceed current Colorado Air Quality standards. The project work shall be performed using practices that minimize air quality detriments during construction. All the standards below shall be followed to improve air quality related to this project:

- (a) Emissions standards:
  - (1) Optimally, electric or hybrid powered equipment or vehicles will be used on all projects.
  - (2) Equipment engines shall be compliant with the most recent Environmental Protection Agency (EPA) requirements.
  - (3) Contractors are required to maintain a minimum emissions level for diesel fueled equipment at a Tier 3 level.
  - (4) Contractors shall provide certification of compliance with diesel emissions standards. Failure to do so will result in immediate stoppage of work and is a non-excusable delay per subsection 108.08(c)2.
  - (5) All diesel vehicles, construction equipment, and generators on site shall be fueled with ultra-low sulfur diesel fuel (ULSD) or a biodiesel (B20) blend approved by the original engine manufacturer with sulfur content of 15 ppm or less.
- (b) Proximity: Any project within 1000 linear feet of a residence or regular gathering location of multiple people (i.e., schools, parks, places of worship, commercial buildings, etc.) is required to have either electric, hybrid or Tier 4 diesel powered equipment or vehicles.
- (c) Exemption: Emergency equipment is exempt from this specification. All reasonable effort will be made to replace equipment placed in service at the beginning of the emergency work with equipment as specified above as soon as possible.
- (d) Definition: Vehicle, for the purposes of this specification, is defined as any diesel-powered company owned car or truck. It does not apply to personal vehicles.
- (e) Cost. Unless shown otherwise in the bid tabulation for this project, costs to achieve this specification will be included in the overall cost of the project.

**Revision of Section 107  
Water Quality Control**

**Section 107** of the Standard Specifications is hereby revised for this project as follows:

**Subsection 107.25(a)** shall include the following:

8. Colorado Department of Transportation or CDOT. All instances of “Colorado Department of Transportation” or “CDOT” shall be replaced with “Boulder County.”

**Subsection 107.25(b)7** the following shall be added:

- (9) Contractor shall submit a dewatering plan which uses either infiltration or a frac tank. If infiltration is to be used, the CDPHE low-risk discharge policy may apply such that a CDPHE dewatering permit may not be required. Submit the following information to Boulder County for approval.

If infiltration is used: infiltration plan including: outfall locations, control measures to prevent erosion at outfalls, control measures to prevent sediment. Plan for restoration of the infiltration area.

**Subsection 107.25 (c), first paragraph** shall be replaced with the following:

Stormwater Construction Permit. It is not anticipated that the project disturbance area will exceed over an acre. However, if the project disturbance area is over an acre, a Colorado Discharge Permit System Stormwater Construction Permit (CDPS-SCP) will be obtained from CDPHE by the Contractor. The Contractor and Boulder County will be co-permittees. The Contractor shall provide a copy of permit certification as the Operator to the Engineer prior to or at the Pre-construction Conference. No work shall begin until the CDPS-SCP permit with Owner and Operator has been approved by CDPHE. A copy of the permit shall be placed in the project SWMP.

**Revision of Section 108  
Prosecution and Progress**

**Section 108** of the Standard Specifications is hereby revised for this project as follows:

**Subsection 108.03** shall include the following:

The Contractor shall submit a CPM baseline schedule to the Engineer at least three (3) working days prior to the preconstruction meeting. This CPM baseline schedule shall show the major salient features of the project through completion.

The minimum salient features to be shown on the Contractor's CPM Schedule are:

- (1) Mobilization
- (2) Detour Installation
- (3) Precast CBC Procurement
- (4) Erosion/Water Control
- (5) Temporary Shoring
- (6) Existing Structure Removal
- (7) CBC Installation
- (8) Cast-In-Place Concrete Installation
- (9) Rip Rap Installation
- (10) Guard and Bridge Rail Installation
- (11) ABC/HMA Placement
- (12) Final Stabilization
- (13) Cleanup/Completion

Meetings will be required to review progress and plan upcoming activities. The Traffic Control Supervisor, the Erosion Control Supervisor and representatives from the Contractor and all active subcontractors shall attend the meetings as necessary. Such meetings will be required on a weekly basis at a time and location to be determined by the Engineer and the Contractor.

At the weekly progress meetings, the Contractor shall submit a written statement of planned activities and anticipated inspection, testing, and surveying requirements for the upcoming three (3) weeks. The Contractor shall provide a 24-hour notice to the Engineer if the Contractor elects to change a planned activity.

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**REVISION OF SECTION 108  
PROSECUTION AND PROGRESS**

The Contractor must complete all aspects of the project including punch-list items within an approved not-to exceed period indicated in the Project Special Provision “Commencement and Completion of Work” or liquidated damages per the table included in Section 108.09 of the CDOT Standard Special Provisions will be incurred.

**Subsection 108.05** shall include the following:

All work performed by the Contractor or any of his agents shall be accomplished during the established working hours of 8:00 a.m. and 4:30 p.m., Monday through Friday. Neither the Contractor nor his agents shall work outside of the daily working hours without prior approval by the Engineer.

If the Contractor receives approval to work additional hours beyond the normal working hours or days in Section 108.05 above for his convenience, the Contractor shall reimburse the County for the cost of providing additional engineering and inspection services. The reimbursement to the County will be at a rate of \$125.00 per hour for each County employee and \$175.00 for each consultant required to be on the job site. This cost will be deducted from any money due the Contractor.

**Revision of Section 202**  
**Removal of Topsoil**

**Section 202** of the Standard Specifications is hereby revised as follows:

*Topsoil Removal:* After the construction area and its access have been delineated, the vegetation should be mowed to a maximum height of four (4) inches over the area to be disturbed. If the amount of vegetation exceeds what can be incorporated into the soil without interfering with establishing a proper seedbed, then excess vegetation shall be removed.

Topsoil should be removed by a front-end loader (preferred method) or grader. Under no circumstances should upland topsoil be removed under wet soil moisture conditions. The depth of the topsoil layer may vary. Topsoil may be delineated from the subsoil by a higher organic matter content (usually, but not always, indicated by a darker color) and a relatively loose and friable soil structure. Typically, topsoil is between four (4) and eight (8) inches in depth.

Under no circumstances shall subsoil be mixed with topsoil, and subsoil shall not be placed on top of the topsoil. If necessary, salvaged topsoil shall be cordoned off to delineate the topsoil from subsoil or other materials. The topsoil shall be protected from contamination by subsoil material, weeds, etc. and from compaction by construction equipment and vehicles.



**Revision of Section 202  
 Removal of Asphalt Mat (5”)**

**Section 202** of the Standard Specifications is hereby revised for this project as follows:

**Subsection 202.01** shall include the following:

This work consists of full removal of the existing asphalt layer and partial removal of the layer at the interface between existing and proposed asphalt paving. The existing asphalt thickness is believed to be between 4” and 5” thick based on soil borings, but may vary throughout the length of removal.

**Subsection 202.12** shall include the following:

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Removal of Asphalt Mat (5”)	SY

Payment for Removal of Asphalt Mat (5”) will be full compensation for all labor and materials required to complete the work, including, preparation and implementation of full removal of existing asphalt and partial removal of asphalt at pavement joint.

**Revision of Section 202  
Removal of Bridge**

**Section 202** of the Standard Specifications is hereby revised for this project as follows:

**Subsection 202.01** shall include the following:

This work consists of removal of the existing bridge that carries Riverside Drive over Cave Creek. Bridge removal shall consist of the complete removal of all superstructure and substructure elements to a depth shown on the plans or at a minimum of one (1) foot below finished grade or one (1) foot below bottom of any new structure element. Plans for the existing structure are not available and existing information is based on visible elements. The removal of bridge items include but are not limited to: concrete bridge railing and end piece, concrete bridge slab, stacked rock abutments and wingwalls, and abutment/wingwall foundations.

**Subsection 202.02** shall include the following:

The removal of the existing bridge shall be performed in a safe manner.

The Contractor shall submit a Bridge Removal Plan to the County, for record purposes only, at least 20 working days prior to the proposed start of removal operations. This Plan shall detail procedures, sequences, and all features required to perform the removal in a safe and controlled manner. The Bridge Removal Plan shall be stamped “Approved for Construction” and signed by the Contractor. The Bridge Removal Plan will not be approved by the Engineer.

The existing abutments are stacked rock and appear to be crumbling in some locations, so removal plan should take this deteriorated condition into consideration. There is no known information about the existing abutment foundations.

There is an existing fiber optic utility attached to the bridge. This utility shall remain in place and be protected during construction. Bridge removal plan shall include means and methods to accommodate the utility during construction.

The Bridge Removal Plan shall provide complete details of the bridge removal process, including:

- (1) The removal sequence, including staging of removal operations. Sequence of operation shall include a detailed schedule that complies with the working hour limitations.
- (2) Equipment descriptions including size, number, type, capacity, and location of equipment during removal operations.

(3) Shoring that exceeds five (5) feet in height, all falsework and bracing.

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**REVISION OF SECTION 202  
REMOVAL OF BRIDGE**

- (4) Details, locations and types of protective coverings to be used. The protective covering shall prevent any materials, equipment or debris from falling onto the property below.
- (5) When removal operations are located over or in proximity to any live waterway, railroad, or pedestrian/bicycle path, additional width of protective covering sufficient to protect these facilities may be required. Detailed methods for protection of the existing roadway facilities, including measures to assure that people, property, utilities, and improvements will not be endangered.
- (6) Detailed methods for protection of live waterways including minimization of turbidity and sedimentation, and protection of existing wetlands.
- (7) Detailed methods for mitigation of fugitive dust resulting from the demolition.
- (8) Details for dismantling, removing, loading, and hauling concrete and rock elements.
- (9) Methods of Handling Traffic, including bicycles and pedestrians, in a safe and controlled manner.
- (10) Details for protecting potentially impacted utilities.

A Pre-Removal Conference shall be held at least seven days prior to the beginning of removal of the bridge. The Engineer, the Contractor, the removal subcontractor, the Contractor's Engineer, and the Traffic Control Supervisor (TCS) shall attend the Pre-Removal Conference. The Bridge Removal Plan shall be finalized at this Conference.

The Contractor shall not begin the removal process without the Engineer's written authorization.

Submittal of the final Bridge Removal Plan to the Engineer, and field inspection performed by the Engineer, will in no way relieve the Contractor and the Contractor's Engineer of full responsibility for the removal plan and procedures.

Removal of hazardous material shall be in accordance with Section 250.

The Contractor shall take all steps to avoid contaminating state waters, in accordance with subsection 107.25.

Should an unplanned event occur, or the bridge removal operation deviate from the submitted bridge removal plan, the bridge removal operations shall immediately cease after performing any work necessary to ensure worksite safety. The Contractor shall submit to the Engineer, the procedure or operation proposed by the Contractor's Engineer to correct or remedy the occurrence of this unplanned event or to revise the final Bridge Removal Plan. The Contractor shall submit his Engineer's report in writing, within 24 hours of the event, summarizing the details of the event and the procedure for correction.

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### **REVISION OF SECTION 202 REMOVAL OF BRIDGE**

Before removal of the protective covering, the Contractor shall clean the protective covering of all debris and fine material.

Bridge removal may be suspended by the Engineer for the following reasons:

- (a) Final Bridge Removal Plan has not been submitted, or written authorization has not been provided by the Engineer to begin the removal.
- (b) The Contractor is not proceeding in accordance with the final Bridge Removal Plan, procedures, or sequence.
- (c) Safety precautions are deemed to be inadequate.
- (d) Existing neighboring facilities are damaged as a result of bridge removal.

Suspension of bridge removal operations shall in no way relieve the Contractor of his responsibility under the terms of the Contract. Bridge removal operations shall not resume until modifications have been made to correct the conditions that resulted in the suspension, as approved in writing by the Engineer.

The Contractor shall notify all emergency response agencies of the proposed removal work and any detours 24 hours in advance of work. This shall include the Engineer, Boulder County Sheriff's Department, local Police Department(s), local Fire Department(s), and local ambulance service(s), as appropriate.

All required traffic control devices, barricades and portable message sign panel(s) signs shall be in place, with detours in operation, prior to the beginning of removal operations each day.

Prior to reopening the roadway to public traffic, all debris, protective pads, materials, and devices shall be removed, and the roadway(s) swept clean.

Explosives shall not be used for removal work without the written approval of the Engineer.

Removal of the substructure including foundations shall be taken down to at least one foot below the natural existing or future ground surface at the lowest point of interface with the abutment, unless otherwise approved by the Engineer. At conflicts between new and existing structure, existing structure shall be removed to at least one foot below bottom of new structure elevation. Holes resulting from substructure removal shall be backfilled with Structure Backfill (Class 2) to the adjacent existing grades.

All materials removed from the existing structure shall become the property of the Contractor and shall be properly disposed of offsite at the Contractor’s expense, unless otherwise stated in the plans.

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**REVISION OF SECTION 202  
REMOVAL OF BRIDGE**

Existing structures, facilities, and surrounding roadways shall not be damaged by the removal operations. Damage that does occur shall be repaired immediately at the Contractor’s expense.

**Subsection 202.12** shall include the following:

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Removal of Bridge	Each

Payment for Removal of Bridge will be full compensation for all labor and materials required to complete the work, including, preparation and implementation of the Bridge Removal Plan, inspection, equipment, debris handling and disposal, handling and disposal of all hazardous materials, disposal of non-salvable materials, and for backfilling holes with Structure Backfill (Class 2).

**Revision of Section 203  
Excavation and Embankment**

**Section 203** of the Standard Specifications is hereby revised for this project as follows:

**Subsection 203.05 (b)**, first paragraph, shall include the following:

Excess material that must be removed from the project shall become the property of the Contractor and disposed of outside the project limits.

The Contractor shall make all arrangements to obtain any required agency permit(s) and written permission from property owners for disposal locations outside the limits of the project, within unincorporated Boulder County.

Disposal of more than 50 cubic yards of unclassified excavation within unincorporated Boulder County may qualify for one of the following Boulder County Community Planning & Permitting review processes:

- (a) Grading Permit,
- (b) Site Plan Review,
- (c) Site Plan Review Waiver, or
- (d) Limited Impact Special Review.

Copies of the permit(s) and written permission shall be furnished to the Engineer before the disposal area is used.

**Subsection 203.12** shall include the following:

Payment for Unclassified Excavation and Unclassified Excavation (Complete in Place) shall also include costs associated with obtaining any necessary permits or written permissions and will not be paid separately.

**Revision of Section 206**

**Temporary Shoring**

**Section 206** of the Standard Specifications is hereby revised for this project as follows:

**Subsection 206.08** shall include the following:

This work shall consist of planning, design, furnishing materials, installation, maintenance, removal, and all labor, equipment and supervision for the construction of a temporary shoring system to remove the existing structure, construct the replacement structure, and protect/support the existing fiber utility line. The system shall consider the geotechnical characteristics of the site as shown on the plans and in the geotechnical report. The shoring system that protects/supports the existing fiber utility shall be coordinated with the utility owner and the Contractor shall assume that review of the shoring design will be required by the utility owner before the shoring system can be installed.



**Revision of Section 207**  
**Topsoil and Wetland Topsoil**

**Section 207** of the Standard Specification is hereby revised as follows:

**Subsection 207.01 last sentence** shall be replaced with the following:

It shall include the placing of topsoil upon constructed cut and fill slopes after grading operations are completed.

**Subsection 207.02** shall include the following:

All topsoil shall be either secured from the site or imported and shall be approved by Boulder County at the source prior to import.

**Subsection 207.03, paragraph one**, shall include the following:

Wetland topsoil material shall be excavated from the area, as designated by a wetland botanist or ecologist, to a maximum depth of 12 inches, or as otherwise designated, and placed within 24 hours in the designated area. Do not excavate beyond areas in which cobble or other non-soil material is encountered. Wetland topsoil salvaged from the site shall have woody vegetation (particularly native willows) salvaged within the expected disturbance areas. Salvage wetland topsoil from different vegetation zones or plant communities separately.

The Contractor shall prepare the relocation site to elevations specified and approved by the Engineer prior to excavating the wetlands. If the Engineer determines that this is not possible, then the Contractor shall stockpile the material in an approved area, to remain undisturbed until the relocation site has been prepared. An approved stockpile area should be on relatively level ground upland areas, separate from other stockpiled soil. Storage time within the stockpile shall be no longer than four weeks for mineral soils and two weeks for organic soils. Stockpiled wetland soil is subject to composting (and associated loss of organic matter and plant propagules) and must be stored in small piles (less than 3 ft x 3 ft x 3 ft) to limit internal heating. Wetland topsoil material shall be placed over the prepared relocation areas to a depth of 12 inches, or as otherwise designated. The site shall be surveyed after grading to ensure design elevations are met.

Stockpile area perimeters should be surrounded with a silt fence set approximately three feet from stockpile edges or downhill from a stockpile located on a slope. Wetland topsoil stockpiles may be covered with an erosion control blanket if drying, intense rainfall, or weed contamination are a concern. However, a cover can encourage composting of organic

materials within the stockpile and should generally be avoided. In areas where stockpiles will be located on top of weedy vegetation, place an erosion control blanket under each stockpile

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**REVISION OF SECTION 207  
TOPSOIL AND WETLAND TOPSOIL**

to limit stockpile contamination. Control invasive weeds that become established on stockpiles with a wetland-approved herbicide as needed.

**Subsection 207.03** shall include the following:

*Relieving Compaction:* Areas to receive topsoil that have been compacted by heavy equipment shall be ripped or chiseled **prior to redistribution of topsoil**. Construction areas and other compacted areas will be chiseled to a minimum depth of 10 inches, with no more than a 10-inch interval between chiseled furrows. Two passes with a chiseler may be necessary, with the second pass chiseling between the first furrows, or perpendicular to original furrows.

*Redistribution of Topsoil and Application of Soil Conditioning:* The topsoil should be redistributed uniformly over the disturbed areas, minimizing compaction by equipment. **Topsoil redistribution shall not occur under wet soil conditions.** When applicable, fertilizer or soil conditioning shall be incorporated evenly throughout the topsoil as described in Specification.

**Revision of Section 208  
Erosion Control**

**Section 208** of the Standard Specification is hereby revised as follows:

**Subsection 208.02(h)** shall include the following:

All erosion logs shall be biodegradable unless otherwise approved by the Engineer.  
Photodegradable will not be accepted.

**Subsection 208.02 (k)** shall include the following:

Prior to the initial arrival onto the project site, all equipment shall be thoroughly power washed, including the undercarriages and tires. Equipment must be clean of mud, vegetative matter, and other debris to prevent importation of non-native and noxious weed seeds from other project sites.

**Revision of Section 209**  
**Watering and Dust Palliatives**

**Section 209** of the Standard Specifications is hereby revised for this project as follows:

**Subsection 209.05** shall include the following:

The contractor shall be responsible for controlling vehicle and equipment speeds within the project site to keep dust to a minimum. The Contractor shall monitor activities daily for dust. If excessive dust is being generated by construction speeding vehicles or equipment the contractor shall immediately take corrective action to ensure operators and drivers control speeds, thereby, assisting in dust suppression.

Application of dust palliative may be required when work is not in progress, including weekends, holidays, and nighttime.

**Subsection 209.08** delete paragraphs one, two and three and replace with the following:

Water and/or dust palliative required for all work covered under the contract will not be measured and paid for separately but shall be included in the work. The source of this water shall be the contractor's responsibility. Water may not be taken from on-site ditches, creeks, or their tributaries.

**Revision of Section 212**  
**Seeding, Fertilizer, Soil Conditioner, and sodding**

**Section 212** of the Standard Specification is hereby revised as follows:

**Subsection 212.02 (a)** shall include the following:

Maximum crop and weed content shall follow the Colorado Seed Certification Standards for certified seed:

- (1) Prohibited (Primary) Noxious Weeds (List A): None,
- (2) Restricted (Secondary) Noxious Weeds (List B): Less than 0.1%, and
- (3) Total Other Crop Seed: Less than 1.0%.

Seed shall be free of Prohibited (Primary) Noxious Weeds (List A) including, but not limited to, Canada thistle, diffuse knapweed, spotted knapweed, Russian knapweed, field bindweed, hoary cress, jointed goat grass, leafy spurge, musk thistle, and yellow toadflax. The Contractor shall be responsible for replacing any refused seed at no additional cost to the project.

If specified type or variety of seed is not available, substitutions must be submitted and approved by the Engineer.

**Subsection 212.02 (b) 1** shall be replaced with the following.

(b) Fertilizer, Soil Conditioners and Biochar

1. Fertilizer: Fertilizer may only be used if directed by the project specific documents.

Fertilizer shall meet the following description; a slow release organic fertilizer composed of dried granulated fungal and bacterial biomass. The nutrient source shall be derived from fermented plant material along with nutrients such as cottonseed meal, soybean meal and trace elements all under sterile conditions. It shall not contain urea or sewage material.

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**REVISION OF SECTION 212  
 SEEDING, FERTILIZER, SOIL CONDITIONER AND SODDING**

The fertilizer shall meet the following minimum requirements:

<b>Criteria</b>	<b>Requirement</b>
Nutrient Content (N-P-K)	7-2-1 <ul style="list-style-type: none"> <li>• Nitrogen (total) &gt;7%</li> <li>• Nitrogen (water soluble) &lt;0.5%</li> <li>• Phosphorus (P205) 2-4%,</li> <li>• Potassium (K20) 1%</li> </ul>
Phosphorous Content	3-6-3, 4-6-4, 3-7-4, or comparable
pH level	6.5-7.5
Organic Material	>75%

**Subsection 212.02 (b) 2** shall be replaced with the following:

2. Soil Conditioner: Soil conditioner shall consist of compost, biological nutrient, biological culture or humic acid-based material. Compost shall be used as a soil conditioner unless otherwise specified in the project specific documents.

Humic acid-based material (Humate) shall be mined from fresh water, sand matrix source and shall include the following:

- (1) A pH 3.5 to 4.0.
- (2) Maximum 15 percent inert ingredients.
- (3) Minimum 85 percent organic material with 50 percent minimum humic acid.

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**REVISION OF SECTION 212  
SEEDING, FERTILIZER, SOIL CONDITIONER AND SODDING**

Compost shall be weed-free, organic compost derived from a variety of feed stocks including agricultural, biosolids, forestry, food, leaf and yard trimmings, manure, tree wood with no substance toxic to plants. Material shall be aerobically composted in a facility permitted by the Colorado Department of Public Health and Environment (CDPHE) to produce or sell compost in accordance with House Bill (HB) 1181. The Contractor shall submit a copy of this permit to the Engineer for approval and the project records. The compost shall be tested in accordance with the U.S. Composting Council's Test Methods for Examining of Composting and Compost (TMECC) manual.

The compost manufacturer shall be a participating member of in the U.S. Composting Council's Seal of Testing Assurance Program (STA). The Contractor shall provide a participation certificate and test data on a Compost Technical Data Sheet. The Contractor shall provide a participation certificate and test data showing the lab analysis on a Compost Technical Data sheet that verifies that the compost meets the requirements. The Contractor shall submit documentation showing the feedstock amount by percentage in the final compost product. Compost feedstock may include, but is not limited to, leaves and yard trimmings, food scraps, food-processing residuals, manure or other agricultural residuals, forest residues, bark, and paper. Biosolids (from sewage treatment facilities) are not considered suitable feedstock.

Compost shall consist of a carbon to nitrogen ratio between 10:1 and 20:1. Compost may consist of one or more of the following, or include other appropriate composts:

- (1) Well-aged dairy cattle manure,
- (2) Well-aged poultry manure, or
- (3) Composted yard wastes.

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**REVISION OF SECTION 212  
 SEEDING, FERTILIZER, SOIL CONDITIONER AND SODDING**

Compost shall have the following physical properties:

<b>Compost Parameters</b>	<b>Reported As</b>	<b>Requirement</b>	<b>Test Method</b>
pH	pH units	6.0 – 8.5	TMECC 04.11-A
Soluble Salts (Electrical Conductivity)	dS m <sup>-1</sup> or mmhos cm <sup>-1</sup>	Maximum 10dS/m	TMECC 04.10-A
Moisture Content	%, wet weight basis	30 – 60%	TMECC 03.09-A
Organic Matter Content	%, dry weight basis	30 – 65%	TMECC 05.07-A
Particle Size (sieve sizes)	%, dry weight basis for each sieve fraction	Passing 1 inch – 100% 1/2 inch – 95%	TMECC 02.02-B
Man-made Inert Contamination	%, dry weight basis	< 1%	TMECC 03.08-A
Stability (Respirometry)	mg CO <sub>2</sub> -C per g TS per day mg CO <sub>2</sub> -C per g OM per day	8 or below	TMECC 05.08-B
Select Pathogens	(PASS/FAIL) Limits: Salmonella <3 MPN/4grams of TS, or Coliform Bacteria <1000 MPN/gram	Pass	TMECC 07.01-B Fecal Coliforms, or 07.02 Salmonella
Trace Metals	(PASS/FAIL) <sup>SEP</sup> Limits (mg kg <sup>-1</sup> , dw basis): As 41, Cd 39, Cu 1500, Pb 300, Hg 17, Ni 420, Se 100, Zn 2800	Pass	TMECC 04.06
Maturity (Bioassay) Percent Emergence Relative Seedling Vigor	%, (average)  %, (average)	> 80%  > 80%	TMECC 05.05-A

The Contractor shall provide a CTR in accordance with subsection 106.13 confirming that the material has been tested in accordance with TMECC.





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**REVISION OF SECTION 212  
 SEEDING, FERTILIZER, SOIL CONDITIONER AND SODDING**

- 3. Biochar: Biochar shall be a USDA Certified Biobased Product. Biochar shall be made in a slow pyrolysis process and exceed 70% carbon content in the delivered product. The size of an individual piece of char shall range between 0.25 inches to 1.25 inches.

*Mycorrhizae*: Supplemental mycorrhizae, Quantum Growth VSC:

- (1) 1.32% humic acid (from peat humus)
- (2) 0.50% *Rhodopsuedomonas palustris*..... 1.0 E+6 cfu/ml
- (3) 0.25% *Bacillus amyloliquefaciens*..... 5.0 E+5 cfu/ml
- (4) 0.25% *Bacillus licheniformis*..... 3.0 E+5 cfu/ml
- (5) 0.25% *Bacillus megaterium*..... 1.0 E+5 cfu/ml
- (6) 0.25% *Bacillus subtilis*..... 2.0 E+5 cfu/ml

Supplemental mycorrhizae, Quantum Growth Light:

- (1) 0.5% *Rhodopsuedomonas palustris*.....5.0 E+6 cells/ml
- (2) 99.5% de-ionized water

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**REVISION OF SECTION 212  
SEEDING, FERTILIZER, SOIL CONDITIONER AND SODDING**

**Subsection 212.06 (a)** shall be replaced with the following:

- (a) *Soil Preparation.* Following redistribution of topsoil, the disturbed areas shall be chiseled again to a minimum depth of 12 inches, with no more than a 10-inch interval between chiseled furrows. Slopes flatter than 2:1, shall be tilled to a well settled, firm, and friable seedbed four (4) inches deep. Slopes 2:1 or steeper shall be left in a roughened condition. Slopes shall be free of soil clods, sticks, stones, and debris more than four (4) inches in any dimension and be brought to the desired grade and line. Uneven grading of the soil surface is acceptable and encouraged to prevent further compaction from excess heavy machinery operation. All slopes shall be free of concrete and asphalt. No soil preparation for seeding shall occur when soil is frozen or in an extreme wet or dry condition.

**Subsection 212.06 (b)** shall be replaced with the following:

- (c) *Fertilizing and Soil Conditioning.* Prior to seeding, fertilizer, soil conditioner, or both shall be applied evenly throughout the topsoil.
1. Fertilizing. Apply approved product at 800 to 1,300 lbs. per acre. Fertilizers shall be incorporated into the top four (4) inches of soil after broadcasting seed.
  2. Compost. Biological nutrient, culture or humic based material called for on the plans shall be uniformly applied at three (3) cubic yards per 1000 square feet onto the soil service. Organic amendments shall be applied uniformly over the soil surface and incorporated into the top six (6) inches of soil. No measurable quantity of organic amendment shall be present on the surface after incorporation.
  3. Biochar. Supplemental mycorrhizae – Quantum Growth VSC applied at 2 gal/acre and Quantum Growth Light applied at 1 gal/acre.

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**REVISION OF SECTION 212  
SEEDING, FERTILIZER, SOIL CONDITIONER AND SODDING**

**Subsection 212.06 (c)** shall be replaced with the following:

- (c) *Seeding.* Seeding shall be accomplished within 24 hours of tilling or scarifying to make special seed bed preparation unnecessary. The seeding application rate shall be as designated in the Contract. All slopes flatter than 2:1 shall be seeded with grass or no-till drills followed by packer wheels. Drag chains are not allowed. Drills shall have depth bands set to maintain a planting depth between  $\frac{1}{2}$  and  $\frac{3}{4}$  inch and shall be set to space the rows not more than seven (7) inches apart. Packer wheels that firm the soil over the drill row are required. Seed that is extremely small shall be sowed from a separate hopper adjusted to the proper rate of application. The Contractor shall notify the Engineer 24 hours in advance and request inspection of seeding areas prior to installation.

Seed must be applied with a grass or no-till drill that is specifically designed to accommodate variability in size and physical characteristic of native grass seeds.

**Seed drills must be clean of seed from previous seeding jobs before any seeding begins.**

If strips greater than seven (7) inches between the rows have been left unplanted or other areas skipped, the Engineer will require additional seeding at the Contractor's expense.

When requested by the Contractor and approved by the Engineer, seeding may be accomplished by broadcast or hydraulic type seeders at twice the rate specified in the Contract at no additional cost to the project.

All seed sown by broadcast-type seeders shall be "raked in" or covered with soil to a depth of at least  $\frac{1}{4}$  inch. Broadcasting seed will be permitted only on small areas not accessible to machine methods. Broadcast seeding shall proceed on freshly disturbed (raked or harrowed) soil surface and broadcast seed shall be immediately raked or harrowed into the surface. Raking shall be accomplished using metal-tined garden or landscape rakes; no plastic leaf rakes shall be allowed. If harrowing is used, an English harrow or its equivalent shall be required.

**Hydraulic seeding will not be accepted.**

Seeded areas damaged due to circumstances beyond the Contractor's control shall be repaired and reseeded as ordered. Payment for this corrective work, when ordered, shall be at the contract prices.

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**REVISION OF SECTION 212  
 SEEDING, FERTILIZER, SOIL CONDITIONER AND SODDING**

Areas not requiring seeding that have been damaged due to the seeding operation shall be required as ordered. Payment for this corrective work, when ordered, shall at the contract prices.

Multiple seeding operations shall be anticipated as portions of job are completed to take advantage of growing conditions and to comply with Section 208 and subsection 212.03.

Application of various types of seeding are as follows:

1. Seeding (Upland). Prior to seeding, the soil conditioner shall be applied at 3 CY per 1000 SF and incorporated into the top eight (8) inches of soil.  
 Seed shall be applied at the percent of mix (% of mix) and application rate (PLS/Acre) that is designated on the plans under Seeding (Upland). Seed shall be applied to Seeding (Upland) areas shown on plans.
2. Seeding (Riparian). Prior to seeding, the soil conditioner shall be applied at 6 CY per 1000 SF and incorporated into the top eight (8) inches of soil.  
 Seed shall be applied at the percent of mix (% of mix) and application rate (PLS/Acre) that is designated on the plans under Seeding (Riparian). Seed shall be applied to Seeding (Riparian) and Perennial (Tublings) areas shown on plans.
3. Combined Seeding. Prior to seeding, the soil conditioner shall be applied at three cubic yards per 1000 SF and incorporated into the top eight (8) inches of soil.  
 Seed shall be made up of 70% Seeding (Upland) and 30% Seeding (Riparian). Combined seeding shall be applied at the percent of mix (% of mix) and application rate (PLS/Acre) that is designated on the plans under both Seeding (Upland) and Seeding (Riparian).

**Subsection 212.07**, paragraph four, shall include the following:

The Contractor shall furnish the Engineer with delivery tickets or bag weight tickets prior to placing any soil conditioner. Any soil conditioner placed by the Contractor without the Engineer’s approval will not be paid for.

Tags attached to bags of seed will not be removed until the bag is opened on site at the time of seeding.

**Revision of Section 214  
Landscape Maintenance**

**Section 214** of the Standard Specifications is hereby revised for this project as follows:

**Subsection 214.01** shall include the following:

This work consists of establishing seeding and sodding.

**Subsection 214.02** shall include the following:

Seeding and sodding material shall be as specified in Standard Specification 212.

**Subsection 214.03** shall include the following:

Seeding and sodding construction requirements shall be as specified in Standard Specification 212.

**Subsection 214.04**, second paragraph shall include the following:

Planting material (Plants) also includes seeding and sodding.

**Subsection 214.04 (b)** shall include the following:

The Contractor shall water, mow and remove noxious weeds and cultivate the seeded or sodded areas as required or as directed by the Engineer. The Contractor shall repair eroded areas, washouts and gullies, replace lost mulch, keep all seeded areas free from weeds, mow weeds prior to flowering and remove seed heads to minimize future weed growth, and do other work necessary to ensure seed establishment and growth.

**Subsection 214.04 (b), 1** shall include the following:

Watering in Irrigated Areas. Seeding shall be watered lightly and often enough to keep the surface of the soil moist during seed germination, which can take up to two to four weeks.

Sodding shall be watered frequently enough to keep the sod and underlying soil moist, not soggy. Sod should be well rooted into the soil below within two to three weeks. Once established, water less frequently, but increase the quantity of water applied to promote deeper rooting.

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**REVISION OF SECTION 214  
LANDSCAPE MAINTENANCE**

**Subsection 214.04 (b), 2** shall include the following:

Watering in Non-irrigated Areas. Seeding shall be watered lightly and often enough to keep the surface of the soil moist during seed germination, which can take up to two to four weeks.

Sodding shall be watered frequently enough to keep the sod and underlying soil moist, not soggy. Sod should be well rooted into the soil below within two to three weeks. Once established, water less frequently, but increase the quantity of water applied to promote deeper rooting.

**Subsection 214.05** shall include the following:

Planting material (Plants) also includes seeding and sodding.

**Subsection 214.06** shall include the following:

Removal of noxious weeds from seeded or sodded areas shall be included in the work for Landscape Maintenance unless there is a specific bid item dedicated to noxious weed removal.

For each month that landscape maintenance is performed for seeding and sodding and accepted during the landscape maintenance period as specified in subsection 214.04, payment for landscape maintenance will be made in installments as follows:

- (1) 10 percent of the lump sum amount will be paid for each of the eight growing season months, March through October.
- (2) 5 percent of the lump sum amount will be paid for each of the winter months, November through February.

Landscape maintenance performed for seeding and sodding during construction will not be measured and paid for separately but shall be included in the work.

Landscape Establishment performed for seeding and sodding, except for landscape maintenance, will not be paid for separately, but shall be included in the work.

**Revision of Section 216  
Soil Retention Covering**

**Section 216** of the Standard Specifications is hereby replaced as follows:

**DESCRIPTION**

**216.01** This work consists of furnishing, preparing, applying, placing, and securing soil retention blankets for erosion control on roadway slopes or channels as designated in the Contract

**MATERIALS**

**216.02** Soil retention covering shall be a soil retention blanket as specified in the Contract. All soil retention coverings shall be biodegradable. Photodegradable will not be accepted. It shall conform to the following:

- (a) *Soil Retention Blanket*. Soil retention blanket shall be composed of degradable natural fibers mechanically bound together between two slowly degrading natural fiber nettings to form a continuous matrix and shall conform to the requirements of Tables 216-1 and 216-2. The blanket shall be of consistent thickness with the fiber evenly distributed over the entire area of the mat.

When biodegradable blanket is specified, the thread shall be 100 percent biodegradable; polypropylene thread is not allowed.

Blankets and nettings shall be non-toxic to vegetation and shall not inhibit germination of native seed mix as specified in the Contract. The materials shall not be toxic or injurious to humans. Class 1 blanket shall be an extended term blanket with a typical 24-month functional longevity. Class 2 blanket shall be a long-term blanket with a typical 36-month functional longevity. The class of blanket is defined by the physical and performance characteristics.

1. *Soil Retention Blanket (Straw-Coconut) (Biodegradable)*. Soil Retention Blanket (Straw-Coconut) shall be a machine produced mat consisting of 70 percent certified weed free agricultural straw or Colorado native grass straw and 30 percent coconut fiber. The blanket shall be either biodegradable or photodegradable. Blankets shall be sewn together on a maximum 2-inch centers.

The top and bottom netting shall be 100 percent biodegradable organic jute fiber. Netting shall be constructed using a weave unattached at intersections which allows the strands of the net to move independently of each other.



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**REVISION OF SECTION 216  
 SOIL RETENTION COVERING**

2. *Soil Retention Blanket (Coconut) (Biodegradable)*. Soil Retention Blanket (Coconut) (Biodegradable) shall be a machine produced mat consisting of 100 percent coconut fiber that is biodegradable.

The top and bottom netting shall be 100 percent biodegradable organic jute fiber. Netting shall be constructed using a weave which is unattached at the intersections, and which allows the strands of the net to move independently of each other.

**TABLE 216-1  
 PHYSICAL REQUIREMENTS FOR  
 SOIL RETENTION BLANKET – BIODEGRADABLE BLANKET**

Bio Degradable Class	Minimum Roll Width	Minimum Thickness ASTM D6525	Acceptable Matrix Fill Material	Min. Mass per Unit Area ASTM D6475	Size of Net Opening
1	6.5 ft.	250 mils	Straw/ Coconut	8oz/sy	Minimum 0.50"x0.50"
					Maximum 0.50"x1.00"
2	6.5 ft.	300 mils	Coconut*	8oz/sy	Minimum 0.50"x0.5"
					Maximum 0.5"x1.00"

\*Minimum Open Area, 36%

**TABLE 216-2  
 PERFORMANCE REQUIREMENTS FOR  
 SOIL RETENTION BLANKET – BIODEGRADABLE BLANKET**

Biodegradable Class	Slope Application "C" Factor <sup>1</sup> ASTM D6459	Minimum Tensile Strength MD <sup>2</sup> ASTM D6818	Minimum Tensile Strength ASTM D4595
1	<0.1 at 3:1	8.33 lbs/in	
2	<0.1 at 3:1	10.42 lb/in	1968 lb/ft

1. "C" Factor is calculated as ratio of soil loss from soil retention blanket protected slope (tested as specified or greater gradient, 3H:1V) to ratio of soil loss from unprotected (control) plot in large-scale testing.

2. MD is for machine direction testing (along the length of the roll).

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### REVISION OF SECTION 216 SOIL RETENTION COVERING

Blankets shall be tested for physical properties and have published data from an independent testing facility.

Large scale testing of Slope Erosion Protection (“C” factor) shall be performed by an independent testing facility.

- (b) *Staples*. Staples shall be made of ductile steel wire, 0.165 inches in diameter, 8 inches long and have a 1-inch crown. “T” shaped staples will not be permitted.

A sample of the staples and a Certificate of Compliance (COC) including the manufacturer's product data showing that the product meets the Contract requirements shall be submitted for approval at the Environmental Pre-construction Conference. Installation of the blanket will not begin until approval has been received from the Engineer in writing.

- (c) *Earth Anchors*. The mechanical earth anchor shall be composed of a load bearing face plate, a tendon rod or wire rope, and a locking head or percussion anchor. Each element of the anchor shall be composed of corrosion resistant materials. The anchor and wire rope shall have a breaking strength of 9,500 pounds utilizing standard tensile testing and ASTM A1007-07. The anchor shall have a minimum 1,000 pounds ultimate holding strength in normal soil and a manufacturer’s recommended minimum driven depth of 3.5 feet.

A sample of the anchors and a Certificate of Compliance (COC) including the manufacturer's product data showing that the product meets the Contract requirements shall be submitted for approval at the Environmental Pre-construction Conference. Installation of the blanket will not begin until approval has been received from the Engineer in writing.

### CONSTRUCTION REQUIREMENTS

**216.03** The Contractor shall install soil retention coverings in accordance with Standard Plan M-216-1 and the following procedure:

- (1) Prepare soil in accordance with subsection 212.06(a).
- (2) Apply topsoil or soil conditioning as directed in the Contract to prepare seed bed.
- (3) Place seed in accordance with the Contract.
- (4) Unroll the covering parallel to the primary direction of flow.

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**REVISION OF SECTION 216  
SOIL RETENTION COVERING**

- (5) Ensure that the covering maintains direct contact with the soil surface over the entirety of the installation area.
- (6) Do not stretch the material or allow it to bridge over surface inconsistencies.
- (7) Staple the covering to the soil such that each staple is flush with the underlying soil.
- (8) Ensure that staples or earth anchors are installed full depth to resist pull out. No bent over staples will be allowed. Install anchor trenches, seams, and terminal ends as shown on the plans.

**216.04 Slope Application.** Soil retention coverings shall be installed on slopes as follows: The upslope end shall be buried in a trench 3 feet beyond the crest of the slope if possible. Trench depth shall be a minimum of six inches unless required by the manufacture to be deeper. Before backfilling begins, staples shall be placed across the width of the trench. The trench shall then be backfilled to grade with soil amended with soil conditioning or topsoil, compacted by foot tamping, and seeded. Fabric shall be brought back over trench and secured with staples or earth anchors at one foot on center.

There shall be an overlap wherever one roll of fabric ends, and another begins with the uphill covering placed on top of the downhill covering. Staples shall be installed in the overlap.

There shall be an overlap wherever two widths of covering are applied side by side. Staples shall be installed in the overlap.

Staple checks shall be installed on the slope length at a maximum of every 35 feet. Each staple check shall consist of two rows of staggered staples.

The down slope end shall be buried in a trench 3 feet beyond the toe of slope. Before backfilling begins, staples shall be placed across the width of the trench. The trench shall then be backfilled to grade with soil amended with soil conditioning or topsoil, compacted by foot tamping and seeded. Fabric shall be brought back over the trench and secured with staples or earth anchors. If a slope runs into State waters or cannot be extended 3 feet beyond the toe of slope, the end of covering shall be secured using a staple check as described above.

Coverings shall be securely fastened to the soil by installing staples or earth anchors at the minimum rate shown on the Standard Plan M-216-1. Staple or earth anchor spacing shall be reduced where required due to soil type or steepness of slope.

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**REVISION OF SECTION 216  
SOIL RETENTION COVERING**

**216.05 Channel Application.** Soil retention coverings shall be installed as follows on a channel application:

Coverings shall be anchored at the beginning and end of the channel across its entire width by burying the end in a trench. Trench depth shall be a minimum of 6 inches, unless a larger depth is specified by the manufacturer's recommendations. Before backfilling begins, staples shall be placed across the width of the trench. The trench shall then be backfilled to grade with soil amended with soil conditioning or topsoil and compacted by foot tamping and seeded. Fabric shall be brought back over the trench and stapled.

Covering shall be unrolled in the direction of flow and placed in the bottom of the channel first. Seams shall not be placed down the center of the channel bottom or in areas of concentrated flows when placing rolls side by side.

There shall be an overlap wherever one roll of covering ends and another begins with the upstream covering placed on top of the downstream covering. Two rows of staggered staples shall be placed.

There shall be an overlap wherever two widths of covering are applied side by side. Staples shall be placed in the overlap.

The covering shall have a channel check slot every 30 feet along the gradient of the flowline. Check slots shall extend the entire width of the channel. The covering shall be buried in a trench. Before backfilling begins, staples shall be placed across the width of the trench. The trench shall then be backfilled to grade with soil amended with soil conditioning or topsoil, compacted by foot tamping, and seeded. Fabric shall be brought back over the trench and continued down the channel.

Coverings shall be securely fastened to the soil by installing staples at the minimum rate shown on the plans. Staple spacing shall be reduced where needed due to soil type or high flows.

**216.06 Maintenance.** The Contractor shall maintain the soil retention coverings until all work on the Contract has been completed and accepted. Maintenance shall consist of the repair of areas where damage is due to the Contractor's operations. Maintenance shall be performed at the Contractor's expense. Repair of those areas damaged by causes not attributable to the Contractor's operations shall be repaired by the Contractor and will be paid for at the contract unit price. Areas shall be repaired to reestablish the condition and grade of the soil and seeding prior to application of the covering.

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**REVISION OF SECTION 216  
 SOIL RETENTION COVERING**

**METHOD OF MEASUREMENT**

216.07 Soil retention coverings, including staples, complete in place and accepted, will be measured by the square yard of finished surface, excluding overlap, which is installed and accepted. Earth anchors will be measured by the actual number of earth anchors complete in place and accepted.

**BASIS OF PAYMENT**

216.08 The accepted quantities of soil retention coverings will be paid for at the contract unit price per square yard. The accepted quantities of earth anchors will be paid for at the contract unit price for each installed.

Payment will be made under:

**Pay Item**

Soil Retention Blanket (Coconut) (Biodegradable Class 2)

**Pay Unit**

Square Yard

**Revision of Section 403  
 Hot Mix Asphalt**

Section 403 of the Standard Specifications is hereby revised for this project as follows:

Subsection 403.02 shall include the following:

The design mix for hot mix asphalt shall conform to the following:

**Table 403-1**

Property	Test Method	Value for Grading		
		SX (50 )	SX (50)	Patching
Air Voids, percent at: N (design)	CPL 5115	3.5 – 4.5	3.5 – 4.5	3.5 – 4.5
Lab Compaction (Revolutions): N (design)	CPL 5115	50	50	50
Stability, minimum	CPL 5106	28	28	28
Aggregate Retained on the 4.75 mm (No. 4) Sieve with at least 2 Mechanically Induced fractured faces, % minimum	CP 45	60	60	60
Accelerated Moisture Susceptibility Tensile Strength Ratio (Lottman), minimum	CPL 5109 Method B	80	80	80
Minimum Dry Split Tensile Strength, psi	CPL 5109 Method B	30	30	30
Grade of Asphalt Cement, Top Layer			PG 58-28	
Grade of Asphalt Cement, Layers below Top		PG 58-28		PG 58-28
Voids in the Mineral Aggregate (VMA) % minimum	CP 48	See Table 403-2	See Table 403-2	See Table 403-2
Voids Filled with Asphalt (VFA), %	AI MS-2	65-80	65-80	65-80
Dust to Fine Gradation Asphalt Ratio: Coarse Gradation	CP 50	0.6 – 1.2 0.8 – 1.6	0.6 – 1.2 0.8 – 1.6	0.6 – 1.2 0.8 – 1.6

- AI MS-2 = Asphalt Institute Manual Series 2
- The current version of CPL 5115 is available from the Region Materials Engineer.
- Mixes with gradations having less than 40% passing the 4.75 mm (No. 4) sieve shall be approached with caution because of constructability problems.
- Gradations for mixes with a nominal maximum aggregate size of one-inch or larger are considered a coarse gradation if they pass below the maximum density line at the #4 screen.
- Gradations for mixes with a nominal maximum aggregate size of ¾ inch or smaller are considered a coarse gradation if they pass below the maximum density line at the #8 screen.

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**REVISION OF SECTION 403  
 HOT MIX ASPHALT**

All mix designs shall be run with a gyratory compaction angle of 1.25 degrees and properties must satisfy Table 403-1. The job mix formula (Form 43) will establish construction targets for asphalt cement and all mix properties at Air Voids up to 1.0 percent below the mix design optimum.

**Table 403-2**

<b>Minimum Voids in the Mineral Aggregate (VMA)</b>			
<b>Nominal Maximum Size*, mm (inches)</b>	<b>***Design Air Voids **</b>		
	<b>3.5%</b>	<b>4.0%</b>	<b>4.5%</b>
37.5 (1½)	11.6	11.7	11.8
25.0 (1)	12.6	12.7	12.8
19.0 (¾)	13.6	13.7	13.8
12.5 (½)	14.6	14.7	14.8
9.5 (¾)	15.6	15.7	15.8
* The Nominal Maximum Size is defined as one sieve larger than the first sieve to retain more than 10%. ** Interpolate specified VMA values for design air voids between those listed. *** Extrapolate specified VMA values for production air voids beyond those listed.			

The Contractor shall prepare a quality control plan outlining the steps taken to minimize segregation of HMA. This plan shall be submitted to the Engineer and approved prior to beginning the paving operations. When the Engineer determines that segregation is unacceptable, the paving shall stop, and the cause of segregation shall be corrected before paving operations will be allowed to resume.

The hot mix asphalt will include reclaimed asphalt pavement (RAP) per revised Standard section 401.



Hot mix asphalt for patching, if needed, shall conform to the gradation requirements for Hot Mix Asphalt (Grading SX) (50) (PG 58-28).

A minimum of one percent hydrated lime by weight of the combined aggregate shall be added to the aggregate for all hot mix asphalt.

Acceptance samples shall be taken according to CP-41.

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**REVISION OF SECTION 403**  
**HOT MIX ASPHALT**

**Subsection 403.03** shall include the following:

A material transfer device will be required for the placement of asphalt on the top lift of paving.

Prior to placing tack coat and beginning overlay work, the surface to be tack coated shall be swept to remove accumulations of loose gravel, vegetation and debris.

All patching shall be completed prior to any mill/planning process and before the heating and scarifying process.

**Subsection 403.05** shall include the following:

Payment will be made under:

PAY ITEM	PAY UNIT
Hot Mix Asphalt (Grading SX) (50)(PG 58-28)	Ton

Aggregate, asphalt recycling agent, additives, hydrated lime, and all other work necessary to complete each hot mix asphalt item will not be paid for separately but shall be included in the unit price bid. When the pay item includes the PG binder grade, the asphalt cement will not be measured and paid for separately but shall be included in the work. Asphalt cement will not be measured and paid for separately but shall be included in the work. Asphalt cement used in Hot Mix Asphalt (Patching) will not be measured and paid for separately but shall be included in the work.

If needed, Hot Mix Asphalt (Patching) (Asphalt) shall include, neat line cutting around the perimeter of the patch area, the removal and disposal of existing pavement and underlying material six (6) inches in depth to achieve the desired patch section, mechanical compaction of subgrade, placement of emulsified asphalt (CSS-1H) tack coat, and the haul, placement, and compaction of four (4) inches of full depth Hot Mix Asphalt.

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**REVISION OF SECTION 403  
HOT MIX ASPHALT**

**Section 403** of the Standard Specifications is hereby revised for this project as follows:  
**Subsection 403.01** shall include the following:

The Contractor shall collect the scale ticket on each load when it is delivered to the project site, and ensure that the information required in subsection 109.01 is shown on each ticket:

The scale tickets shall be available on site for County personnel to inspect.

Each day the Contractor shall provide to the Engineer envelopes which contain the previous day's signed tickets and the following:

1. On each envelope: Project number, date of paving, type of material, daily total and cumulative total.
2. One of the following:
  - A. Two adding machine tape tabulations of the weight tickets with corresponding totals run and signed by different persons,
  - B. One signed adding machine tape tabulation of the weight tickets that has been checked and signed by a second person,
  - C. Signed check tape of computer scale tickets that have a cumulative total. These scale tickets must be consecutive and without voids adjustments.
3. A listing of any overweight loads on the envelope, including ticket numbers and amount over legal limit.
4. A comparison of the actual yield for each day's placement to the theoretical yield. Theoretical yield shall be based on the actual area paved, the planned thickness, and the actual density of the mixture being placed. Any variance greater than +2.5% shall be indicated on the envelope and a written explanation included.

The Contractor shall provide a vehicle identification sheet that contains the following information for each vehicle:

- (1) Vehicle number
- (2) Length
- (3) Tare weight
- (4) Number of axles
- (5) Distance between extreme axles

- (6) All other information required to determine legal weight
- (7) Legal weight limit

**Revision of Section 606**  
**Cast-In-Place Bridge Rail**

**Section 606** of the Standard Specifications is hereby revised as follows:

**Subsection 606.01** shall include the following:

This work shall consist of furnishing all labor, materials, equipment, and perform all operations necessary for the successful installation of the structural, decorative, cast-in-place bridge rail. Construction shall be in accordance with these specifications and in conformity to the plans.

**Subsection 606.02** shall include the following:

The Cast-In-Place Bridge Rail concrete materials shall meet CDOT Specification 601 and reinforcing steel materials shall meet CDOT Specification 602. Finish shall be Class 4 and the railing will receive structural concrete coating in accordance with CDOT Specifications 601.

**Subsection 606.05** shall include the following:

Cast-In-Place Bridge Rail will be measured by the linear foot of rail installed and will include both end transition pieces on the south side of the structure. Measurement begins and ends at the external edges of the “Transition and Wingwall Length” as shown in the plans. The bridge rail item will begin at the top of the cast-in-place headwall and go up to the top of the rail.

**Subsection 606.06** shall include the following:

All work and materials necessary and incidental to the cast-in-place bridge rail shall be compensation for complete installation including but not limited to concrete formwork, reinforcing steel, cast-in-place concrete work and concrete surface finishing. Payment will be made for the entire length of railing on top of the concrete box culvert and the end transition pieces which connect to the anchor slab. Reinforcing and concrete for the concrete headwall and anchor slab is paid for separately.

**Section 621**  
**Construction Access**

**Section 621** is hereby added to the Standard Specifications for this project and shall include the following:

**DESCRIPTION**

**621.01** This work shall consist of furnishing all labor, materials, and equipment, and performing all operations necessary to construct a creek access road from Riverside Drive to the N. St. Vrain Creek channel to perform the construction work within the channel.

**MATERIALS**

**621.02** Creek Access materials shall conform to the following:

- (a) Aggregate shall be crushed natural aggregate with at least two fractured faces. Gradation shall conform to 208.02 (1).
- (b) Recycled crushed concrete or asphalt shall not be used for the creek access road
- (c) If used, geotextile shall be a minimum Class 2, conforming to subsection 712.08.
- (d) A thin layer of stone, geotextile, or other stable surface may be required to stop rutting under the construction access road.

**CONSTRUCTION REQUIREMENTS**

**621.03** A construction access road shall provide access from Riverside Drive to the N. St Vrain Creek channel. The access road shall be placed only at a location approved by the Engineer. Means, and methods for the access road shall be determined by the Contractor and submitted to the Engineer for approval at the preconstruction conference. Materials shall conform to 621.02 and be approved by the Engineer.

- (a) *Wetlands.* Temporary impacts to the wetland shall be minimized to the greatest extent possible and as shown in the plans. Following construction, wetland areas impacted shall be restored and revegetated by disking wetlands covered by the construction access road or removing, stockpiling, and replanting wetland topsoil. The method used for restoring temporarily impacted wetlands shall be approved by Boulder County.
- (b) *Permits.* The road construction shall be in accordance with applicable project permits including but not limited to, Boulder County Floodplain Development, Boulder County Stormwater Quality Permit, and Army Corps 404 permit.
- (c) *Construction.* The construction access road shall be constructed to the minimum size necessary while also ensuring enough area as to allow room for equipment to stay within the designated area.

(d) *Maintenance.* The Contractor shall maintain the creek access road during the entire time that it is in use for the project.

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**SECTION 621  
 CONSTRUCTION ACCESS**

(e) *Removal.* Removal of the road shall be done to minimize impacts to the surrounding area as much as possible and shall conform to section 208, when appropriate.

(f) *Other Agencies.* If CDPHE, US Army Corps of Engineers (USACE), the Environmental Protection Agency (EPA), or a Local Agency reviews the project site and requires additional measures to prevent and control erosion, sediment, or pollutants, the Contractor shall cease and desist activities resulting in pollutant discharge and immediately implement these measures. Implementation of these additional measures will be paid for at contract unit prices.

**METHOD OF MEASUREMENT**

**621.04** Construction Access will not be measured but will be paid for on a lump sum basis.

**BASIS OF PAYMENT**

**621.05** The accepted quantity of creek access road measured as provided above will be paid for at the contract unit price bid.

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Creek Access Road	Lump Sum

Payment for will be full compensation for all labor, materials and equipment required to install, maintain and remove the road. Any additional material necessary to maintain the creek access road shall not be paid for separately but shall in be included in the work.

Other incidental work that is not included as a pay item will not be measured and paid for separately but shall be included in the work.

**Revision of Section 626  
Public Information Services**

**Section 626** of the Standard Specifications is hereby revised for this project to include the following:

**DESCRIPTION**

This work consists of providing Public Information Services throughout the duration of the project. Anticipated communications issues on this project include:

- (1) Pre-construction notification
- (2) Construction duration notification throughout the length of project

**CONSTRUCTION REQUIREMENTS**

The Boulder County Public Works Department Public Information Officer (PIO) will coordinate public information regarding the project and provide timely updates regarding construction to the public through a variety of established channels.

- (a) *Public Information Manager (PIM)*. The contractor shall designate a PIM with whom the PIO can confer with as needed to ensure that all pertinent construction-related information is conveyed to the public. Within 10 days following the date of the Notice to Proceed, the Contractor shall submit the name, contact information, and the Backup to the Engineer, and county PIO. The contractor-designated representative may maintain a direct line of contact with the PIO to assist with answering questions from the public. The county PIO will also conduct any media related activities that may arise over the course of the project. All media inquiries will be directed to the county PIO for follow up. The PIM may be called upon to assist with media related requests for information and photo or video content.
- (b) *Activities of the PIM*. From the Notice to Proceed through the Final Acceptance of the project, the PIM shall be responsible for the following:
  - (1) *Signing*. It shall be the contractor's responsibility to maintain adequate signage throughout the construction site. The Contractor shall erect construction traffic signs with the dates the Contractor expects to initiate and complete construction and with the Contractor's public information office's or PIO's phone number at each major approach to the project. The signs shall conform to the requirements of Section 630 and shall be erected at least one week prior to the beginning of construction. These signs shall be updated if the project schedule changes, at no cost to the project.



- (2) *Variable Message Sign Panel.* The contractor should confer with the County PIO and the County Engineering Project Manager on any messages that will appear on static or variable messaging boards. A total of three (3) portable message sign panels shall be placed seven (7) calendar days in advance of work. Locations will be approved by the Engineer.

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**REVISION OF SECTION 626  
PUBLIC INFORMATION SERVICES**

- (3) *Resident/Property Owner Communications.* It will also be up to the contractor to maintain communications with area residents/property owners who will be directly impacted by daily construction activities. The contractor can do this as they so choose (door hangers, site visits, etc.) but they are to inform any resident at least 48-hours prior to work being conducted in front of a property so that they understand the impacts of the work and how they can access their home while work is taking place in their area.
- (4) *Emergency Vehicles.* Access for emergency vehicles must always be provided.
- (b) *Public Information Management Contact Sheet.* The PIM shall complete and update a Public Information Management Contact Sheet with the names and contact information of the individuals pertinent to Public Information. At a minimum the Contact Sheet will include the Engineer, PIO, RCM, PIM, Contractor Superintendent, and Traffic Control Supervisor.

(1) Public Information Services Contact Sheet Owners

Boulder County Public Works  
Colton Coughlin  
Phone: 303-682-6774  
Email: ccoughlin@bouldercounty.org

Public Information Officer (PIO)  
Andrew Barth  
Phone: 303-441-1032 Fax: 303-441-4594  
Email: abarth@bouldercounty.org

(2) Public Information Services Stakeholders

- Boulder County Sheriff Department
- Allenspark Fire Protection District
- Other Emergency providers servicing this area

**METHOD OF MEASUREMENT AND BASIS OF PAYMENT**

Public Information Services will not be measured and paid for separately but be included with the items in under Section 630 Construction Zone Traffic Control.

**Revision of Section 627  
Pavement Marking**

**Section 627** of the Standard Specifications is hereby revised for this project as follows:

Full-compliance pavement markings by means of temporary or final markings shall be in place at the end of the day following placement of the upper asphalt lift both for detour pavement and permanent pavement.

- (f) *Pre-striping and Marking Construction Meeting.* A pre-striping and marking construction meeting shall be held prior to the layout to confirm the pavement marking plan. At a minimum, attendees shall include the Contractor, the Striping Contractor or Subcontractor and Department representative(s).

Any striping or marking detail or minor modification shall be provided by the Department in advance of layout. Minor changes shall be addressed in the Pre-striping and Marking Construction Meeting and vetted for constructability and cost.

Any significant modification shall be addressed by an approved change modification order with the Engineer prior the Pre-striping and Marking Construction Meeting.

Control Points and layout shall be done by the Contractor no less than 48 hours prior to striping and marking, and the Department shall review and approve the layout prior to the work whether temporary or final. Layout of all pavement marking, whether temporary or final, is included in the work.

**Subsection 627.05** shall include the following:

The Contractor shall clean up excess beads with 24 hours of placement from the roadway, shoulders and adjacent facilities. When used, Contractor shall leave all “Highway Striping” “next \_\_miles” construction warning signs in place until excess glass beads have been cleared from the facilities.

**Subsection 627.06** shall include the following:

Crosswalk bars shall be two feet wide and nine feet long unless otherwise noted.

Thermoplastic pavement marking arrows shall be the elongated type.

The Contractor shall clean up excess beads from the roadway, shoulders and adjacent facilities. Clean up of excess beads shall be included in the work.

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**REVISION OF SECTION 627  
PAVEMENT MARKING**

**Subsection 627.13** shall include the following:

Clean up of excess beads shall be included in the cost of the work.

**Revision of Section 630**  
**Construction Zone Traffic Control**

**Section 630** of the Standard Specifications is hereby revised for this project as follows:

**Subsection 630.09** shall be revised for this project to include the following:

Portable message sign panels shall be placed at the locations shown in the plan or otherwise approved by Boulder County. The signs shall be posted seven calendar days in advance of and throughout construction activities. The Contractor shall also meet the requirements set forth in Standard Special Revision of 626 for Public Information Services in regard to the portable message sign panels.

**Employee vehicle parking is prohibited where it conflicts with safety, access or flow of traffic. The Contractor is responsible for obtaining, coordinating and maintaining acceptable parking and staging areas for the duration of the construction activities. This is considered incidental to the work and payment is included in the Mobilization work item.**

Full-compliance pavement markings by means of temporary or final markings shall be in place at the end of the day following placement of the upper asphalt lift both for detour pavement and permanent pavement.

All costs incidental to the foregoing requirements shall be included in the original contract prices for the project.

Subsection 630.11 shall include the following:

The Contractor's Superintendent and Traffic Control Supervisor (TCS) shall always be equipped with a mobile telephone unit that has a local number for contact with one another, the Engineer, and emergency response dispatchers when emergency services are required. The TCS shall make immediate contact with emergency personnel as required to assist accident victims, expedite the removal of broken-down vehicles, and maintain the smooth flow of traffic. This shall not be paid for separately but shall be included in the work items under Section 630.

The Contractor shall supply a 5-watt, FM band hand-held radio, capable of transmitting and receiving on three frequencies throughout the limits as required for traffic and safety control, to the Project Engineer, Assistant Project Engineer, Head Tester, Traffic Control Supervisor, each flagger, and other personnel as required. The radios shall be equipped with battery chargers and rechargeable batteries. The radios shall be supplied seven days

prior to the commencement of work. This shall not be paid for separately but shall be included in the work items under Section 630.

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**REVISION OF SECTION 630  
CONSTRUCTION ZONE TRAFFIC CONTROL**

**Subsection 630.14** shall include the following:

**All flagging personnel used on the project shall be certified for traffic control operations.**

**Subsection 630.18** shall include the following:

**All labor, equipment, materials, and incidentals required for pedestrian, bicycle traffic and vehicle traffic control and maintenance, including construction signing, channelizing devices, barricades etc., where there is not a specific pay item shall be incidental to the project.**



**Revision of Section 703  
Aggregates**

**Section 703** of the Standard Specification is hereby revised for this project as follows:

**Subsection 703.00** shall include the following:

No crushed slag, crushed reclaimed concrete or recycled asphalt material may be used as a substitute for aggregates when used for aggregate material that is exposed to the elements.

**Subsection 703.03** shall include the following:

Aggregates for bases used for shoulder material shall be crushed stone, crushed gravel or natural gravel and shall not be crushed slag, crushed reclaimed concrete or asphalt material unless otherwise approved by the Engineer.

## FORCE ACCOUNT ITEMS

### DESCRIPTION

This special provision contains the Division’s estimate for force account items included in the Contract. The estimated amounts marked with an asterisk will be added to the total bid to determine the amount of the performance and payment bonds. Force Account work shall be performed as directed by the Engineer.

### BASIS OF PAYMENT

Payment will be made in accordance with subsection 109.04. Payment will constitute full compensation for all work necessary to complete the item.

Force account work valued at \$5,000 or less that must be performed by a licensed journeyman in order to comply with federal, state, or local codes, may be paid for after receipt of an itemized statement endorsed by the Contractor.

<b>Force Account Item</b>	<b>Unit</b>	<b>Quantity</b>	<b>Amount</b>
F/A Minor Contract Revisions	F.A.	1	\$ 108,200
F/A Erosion Control	F.A.	1	\$ 5,000

**F/A Minor Contract Revisions** – Consists of minor work authorized and approved by the Engineer, which is not included in the contract drawings or specifications and is necessary to accomplish the scope of this contract.

**F/A Erosion Control** – This work consists of Stormwater BMPs authorized and approved by the Engineer. This Force Account is to pay for all necessary work and materials for erosion control items not identified in the plans and at the Engineer’s direction. Payment will be made based on time and materials used to perform the work. All items shall be pre-approved by the Engineer prior to installation or they will be at no cost to the project.

### **Traffic Control Plan – General**

The key elements of the Contractor's method of handling traffic (MHT) are outlined in subsection 630.10(a).

The components of the TCP for this project are included in the following:

- 1) Subsection 104.04 and Section 630 of the standard specifications.
- 2) Standard Plan S-630-1, Traffic Controls for Highway Construction, and Standard Plan S-630-2, Barricades, Drums, Concrete Barriers (Temp),
- 3) Schedule of Construction Traffic Control Devices,
- 4) Project's Detour Plan
- 5) Construction Plans, and
- 6) Manual of Traffic Control Devices (MUTCD)

Advanced signing shall be placed at all approach roadways as shown on the plans.

The Contractor shall submit to the County Traffic Engineer a method of handling vehicular traffic for approval at least one week prior to each construction phase, prior to changes in traffic control, and prior to any construction.

The Contractor shall notify the County a minimum of 48 hours prior to any traffic restrictions. The Contractor shall submit traffic control plans to the County, and other impacted jurisdictions for approval prior to any lane closures and restrictions. The traffic control plans shall show the Contractor's method of handling traffic along with the locations of traffic control devices and the requirements for flagging. Access to local residents and properties will be maintained at all times.

Unless otherwise approved by the Engineer, the Contractor's equipment shall follow normal and legal traffic movements. The Contractor's ingress and egress of the work area shall be accomplished with as little disruption to traffic as possible. Traffic control devices shall be removed by picking up the devices in a reverse sequence to that used for installation. This may require moving backwards through the work zone. When located behind barrier or at other locations shown on approved traffic control plans, equipment may operate in a direction opposite to adjacent traffic.

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### **TRAFFIC CONTROL PLAN – GENERAL**

Flagging Operations shall be performed during lane closures. There shall be a maximum 15-minute delay to traffic during these operations.

Flagging shall be performed in accordance with C.R.S 43-5-308.

If any of these traffic control limitations are not met on any one day, the Engineer may apply a disincentive of \$1000/day.

Special Traffic Control Plan requirements for this project are as follows:

The Contractor will develop an access control plan in coordination with adjacent property owners and submit it in conjunction with the traffic control plan to the Engineer for approval prior to the start of any work. The contractor shall maintain access to all adjacent property owner's property unless approved explicitly by Boulder County.

The Contractor shall not place the tack coat on any surface to be overlaid where traffic will be forced to travel upon the fresh oil.

The Contractor and the subcontractors shall equip their construction vehicles with flashing amber lights or as directed by the Engineer.

During the construction of this project, traffic shall use the present traveled roadway unless identified on the plans or approved by the Engineer.

The Contractor shall not have construction equipment or materials in the lanes open to traffic at any time, unless approved by the Engineer.

At least one week prior to starting construction, the Contractor shall notify the Engineer of the date the Contractor intends to start construction.

All costs incidental to the foregoing requirements shall be included in the original contract prices for the project.

**Utilities**

Known utilities within the limits of this project are:

UTILITY OWNER / ADDRESS	CONTACT / EMAIL	PHONE / FAX
Boulder County	Dave Webster dwebster@bouldercounty.org	720-564-2660
Lumen/Century Link	Daniel Trupp Daniel.trupp@centurlink.com	970-689-6856
Xcel Energy	Gary D. Motsinger gary.d.motsinger@xcelenergy.com	303-571-3186

The work described in the contract documents, including the plans and specifications, requires coordination and scheduling between the Contractor and the utility companies in accordance with subsection 105.11 in conducting their respective operations as necessary to complete the utility work with minimum delay to the project. Utility relocation work may not have been completed prior to the contractor beginning construction activities. The County will work to encourage utilities to move their facilities before construction commences but cannot provide any assurance that utility work will have been completed prior to start of construction.

Subsurface Utility Engineering was performed by Utility Mapping Services and is available to the contractor. Test Holes were not performed for this project.

Coordinating and scheduling utility relocation with utility owners is ultimately the responsibility of Contractor; any assistance provided by County shall be deemed a courtesy to Contractor and will not alleviate Contractor of its responsibility to coordinate and schedule utility relocation.

Contractor’s failure to initially provide for sufficient time in the project schedule for all required utility relocations shall not alleviate Contractor from its obligations hereunder, and shall not entitle Contractor to additional time or compensation.

**-2-  
 UTILITIES**

**THE WORK LISTED BELOW SHALL BE PERFORMED BY THE CONTRACTOR:**

The work listed below shall be performed by the Contractor in accordance with the plans and specifications, and as directed by the Engineer. The Contractor shall keep each utility company advised of any work being done to its facility, so that the utility company can coordinate its inspections for final acceptance of the work with the Engineer.

The Contractor shall provide written notice to each utility owner, with a copy to the Engineer, immediately prior to each utility work element expected to be coordinated with construction.

FOR:

Xcel Energy – Electric

1. Coordinate with utility when within ten feet of utility

Lumen/CenturyLink – Telephone and Fiber Optic

1. Notify utility owner with adequate notice (minimum 2 weeks) prior to any excavation/demolition near existing utilities.
2. Perform exploratory excavation, if needed, to assess relocation potential and temporary support requirements for excavation and utilities, as needed.
3. Submit all pre-installation plans and submittals per specifications to County and utility owner with adequate notice (minimum 2 weeks) prior to work.
4. Install and monitor temporary shoring and utility protection per submitted plans. Protect and support existing utility within the limits of construction at all times during construction.
5. Relocate utilities, as needed, to new proposed location to be determined during construction as coordinated with utility owner.
6. Dispose and remove any existing temporary support of exaction and utilities, protective conduit or casing, or conduit fasteners that are proposed to be removed, as confirmed by utility owner.
7. Notify utility owner with adequate notice when concret box installation is completed, prior to backfilling top of box, so utility owner can install protective covering of utility prior to backfill and pavement over culvert.
8. Proactively coordinate and correspond with utility owner prior to and during construcion to minimize schedule delays. Contractor’s consruction schedule shall include appropriate time for utility owner to perform the work listed below.

**THE WORK LISTED BELOW WILL BE PERFORMED BY THE UTILITY OWNERS OR THEIR AGENTS:**

**-3-**  
**UTILITIES**

Xcel Energy - Electric

1. Provide correspondence/coordination with construction contractor regarding the proximity of construction equipment to utilities, including any restrictions or conflicts with current utilities.

Century Link - Telephone and Fiber Optic

1. Pre-installation coordination including review of temporary support of excavation and utilities in-place submittals.
2. Install protective utility covering (assumed to be concrete encasement) after utility is relocated and precast box has been installed, prior to backfill on top of the box and roadway pavement installation.
3. Provide staff on-site during construction as needed to observe/monitor proposed construction in the vicinity of the current and/or proposed utility line.
4. Notify Contractor of duration of tasks that are to be provided by utility company with appropriate updates if schedule revisions are needed.

GENERAL:

The Contractor shall comply with Article 1.5 of Title 9, CRS ("Excavation Requirements") when excavation or grading is planned in the area of underground utility facilities. The Contractor shall notify all affected utilities at least two (2) business days, not including the day of notification, prior to commencing such operations. The Contractor shall contact the Utility Notification Center of Colorado (UNCC) at (8-1-1) or 1-800-922-1987 to have locations of UNCC registered lines marked by member companies. All other underground facilities shall be located by contacting the respective company. Utility service laterals shall also be located prior to beginning excavating or grading.

The location of utility facilities as shown on the plan and profile sheets, and herein described, were obtained from the best available information. It is Contractor's responsibility to verify such information and to locate, preserve, and coordinate the relocation (if required) of all existing utilities, whether shown in the contract documents or not. If utility conflicts, beyond those described in the contract documents, are encountered by Contractor during construction, Contractor shall file prompt, sufficient notice to the owner of the utility so that it may make the necessary adjustments, as well as the Engineer.

Unless otherwise noted in the contract documents, Contractor may relocate or adjust the utility lines or service connections for its convenience with the permission of the owner of the utility and

the Engineer, at no increase in contract price or contract time.

At all times, Contractor shall take reasonable steps to protect the utilities and prevent service

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**UTILITIES**

disruption. Whenever Contractor damages a utility or causes any interruption to any utility service, Contractor shall promptly notify the Engineer, the affected utility owner, and the appropriate governmental authorities. Contractor shall cooperate with the affected utility owner and the appropriate governmental authorities in the restoration of service. If the damage is to a utility that is known or should have been discovered before damage occurred, Contractor shall be responsible for all costs associated with its repair and restoration of service, at no increase in contract price or contract time.

Prior to excavating or performing any earthwork operations, the Contractor shall positively locate all potential conflicts with existing underground utilities and proposed construction, as determined by the Contractor according to proposed methods and schedule of construction. The Contractor shall propose modifications to construction plans to avoid existing underground facilities as needed, and as approved by the Engineer.

The Contractor shall provide traffic control and survey for any utility work expected to be coordinated with construction, as directed by the Engineer.

All costs incidental to the foregoing requirements will not be paid for separately but shall be included in the work.

Coordination with utility owners includes, but is not limited to, the Contractor staking construction features, providing and periodically updating an accurate construction schedule which includes all utility work elements, providing written notification of upcoming required utility work elements as the construction schedule indicates, allowing the expected number of working days for utilities to complete necessary relocation work, conducting necessary utility coordination meetings, and all other necessary accommodations as required for the project to continue per the schedule. Surveying or staking of utility relocations to be performed by the utility owner shall be the responsibility of the utility owner. The County will cooperate with the Contractor and the utility owner for the relocation of utilities, but cannot guarantee utilities will be relocated in a timely manner. Contractor acknowledges that utilities may not be relocated prior to commencement of construction and has considered this uncertainty in preparation of its bid/proposal.

In the event of delayed utility relocations caused by utility owners, Contractor shall use best efforts to mitigate the resulting impacts on the project schedule and costs. Best efforts to mitigate shall include evaluating and proposing alternative methods of work sequencing or construction methods in order to continue the work; Contractor is prohibited from implementing



any alternative methods without prior approval of the Engineer and County.

Contractor hereby holds the County harmless against all risks arising from acts or omissions of utility owners that damage the work or generate delays, disruptions, or additional cost to Contractor in performance of the work. Subject to subsection 108.08, contract time may be extended on account of acts and omissions of utility owners that delay the work without fault of the Contractor.

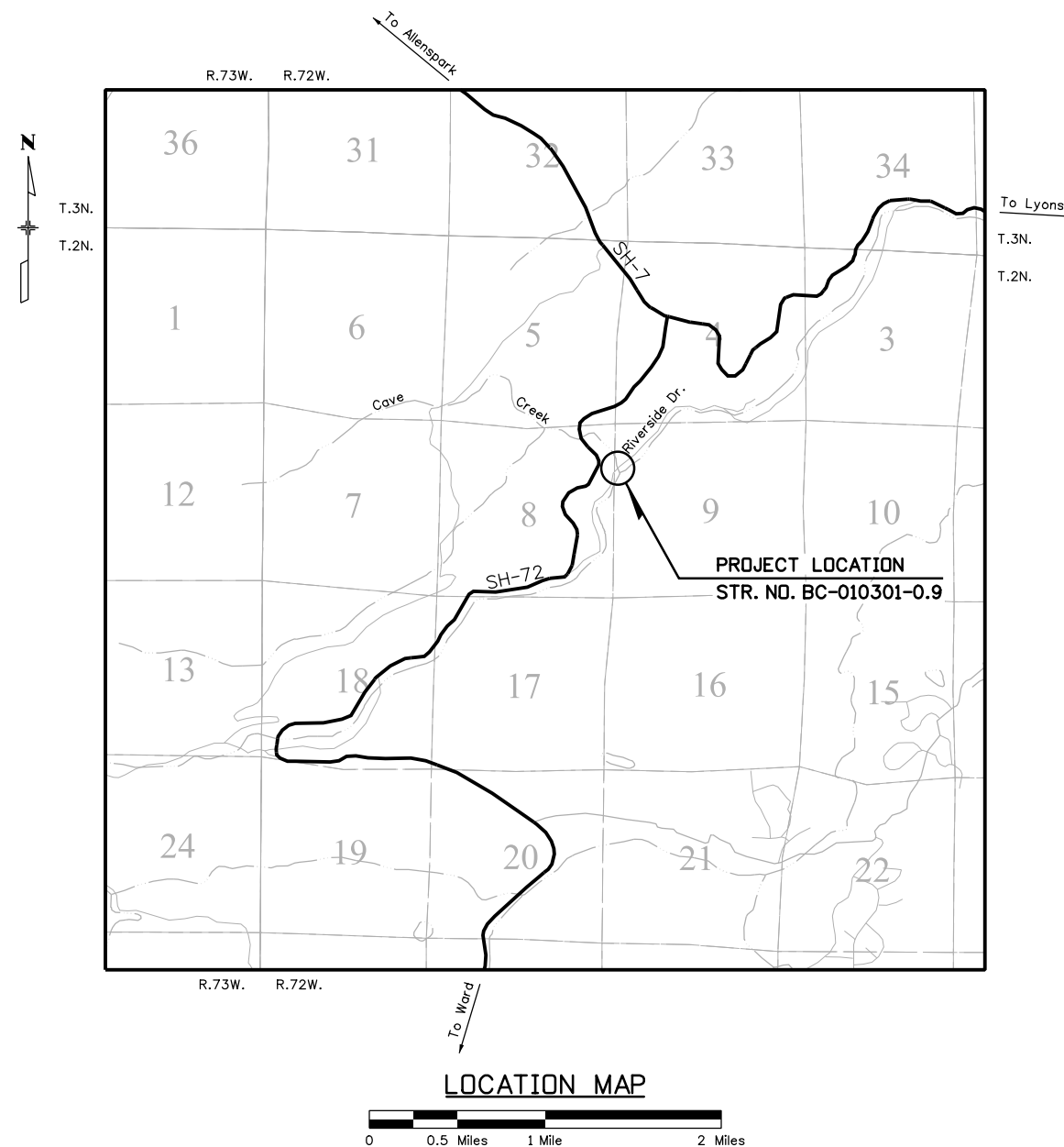
# BOULDER COUNTY, COLORADO

## MINOR STRUCTURE REPLACEMENT OF RIVERSIDE DRIVE OVER CAVE CREEK BOULDER COUNTY PROJECT NUMBER BC-103-009

### PROJECT SCOPE OF WORK:

THIS PROJECT CONSISTS OF REPLACING AN EXISTING CAST-IN-PLACE CONCRETE SLAB ON STONE MASONRY ABUTMENTS AND WINGWALLS WITH A 14'Wx7'H (INTERIOR DIMENSIONS) CONCRETE BOX CULVERT WITH CAST-IN-PLACE CONCRETE HEADWALLS, CAST-IN-PLACE DDGHOUSE RAIL, WINGWALLS, AND TOEWALLS.

THE PROJECT ALSO INCLUDES CLEARING AND GRUBBING, REMOVALS (ASPHALT, STRUCTURES, SIGNS), EXCAVATION AND BACKFILL, SEEDING, MULCHING, EROSION CONTROL, DEWATERING, ASPHALT PATCHING, RIPRAP, GUARDRAIL, TRAFFIC CONTROL WITH A ROAD CLOSURE AND DETOUR, CONSTRUCTION SURVEYING, STRIPING, AND MOBILIZATION.



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4-6	GENERAL NOTES
7-9	SUMMARY OF APPROXIMATE QUANTITIES
10	TABULATIONS
11	PLAN AND PROFILE GRADE
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15	DETOUR PLAN
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25-26	SUGGESTED TEMPORARY DIVERSION
27-35	DETAILS STRUCTURE NO. BC-010301-0.9A
36	UTILITY PLAN
37-42	ROADWAY CROSS SECTIONS
43	R.O.W. EXHIBIT
	SUE PLANS

**FINAL**  
July, 2023

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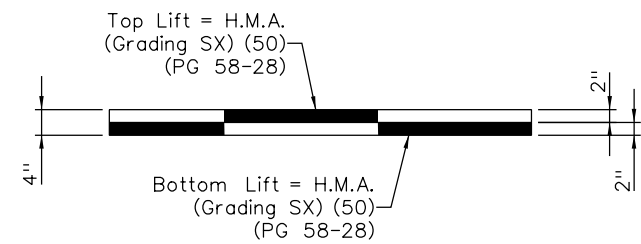
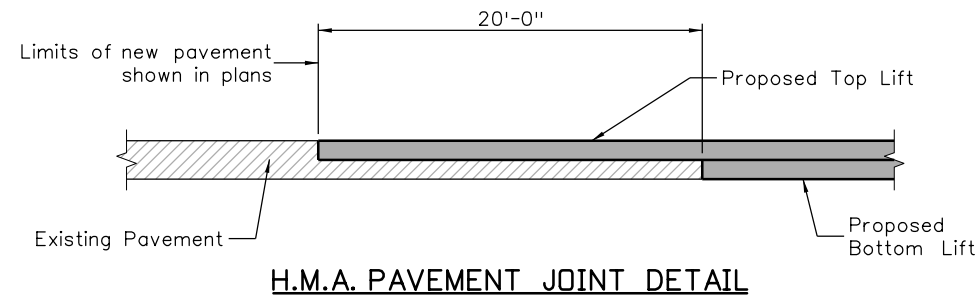
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**COLORADO**  
DEPARTMENT OF TRANSPORTATION  
**M&S STANDARDS PLANS LIST**  
July 31, 2019  
Revised on June 15, 2023

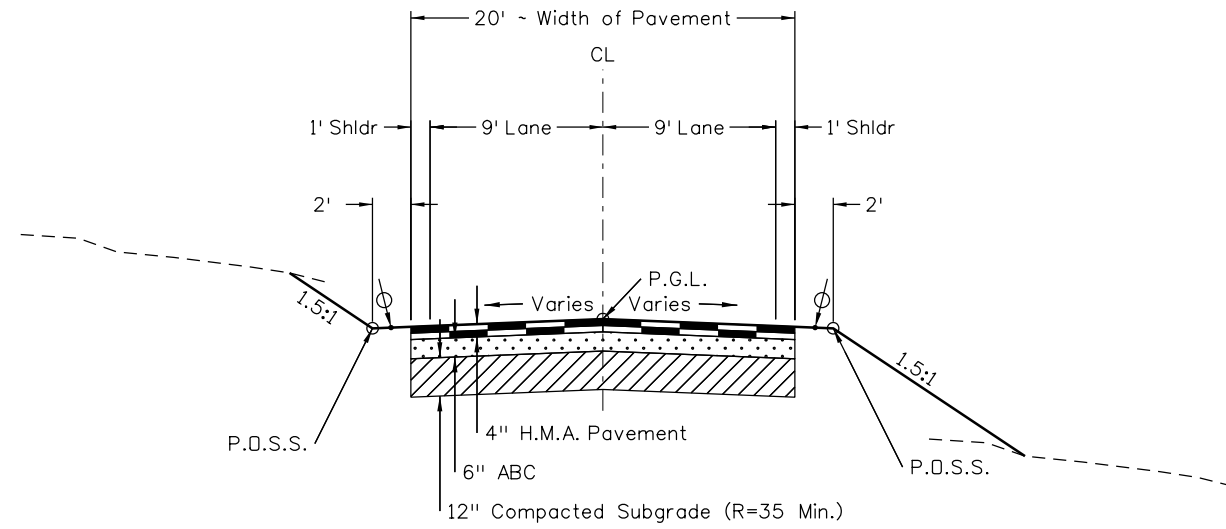
ALL OF THE M&S STANDARD PLANS, AS SUPPLEMENTED AND REVISED, APPLY TO THIS PROJECT WHEN USED BY DESIGNATED PAY ITEM OR SUBSIDIARY ITEM.

THE M&S STANDARD PLANS USED TO DESIGN THIS PROJECT ARE INDICATED BY A MARKED BOX , AND WILL BE ATTACHED TO THE PLANS. ALL OTHER M&S STANDARD PLANS ARE STILL ELIGIBLE FOR USE IN CONSTRUCTION IF APPROVED BY AN APPROPRIATE CDOT ENGINEER.

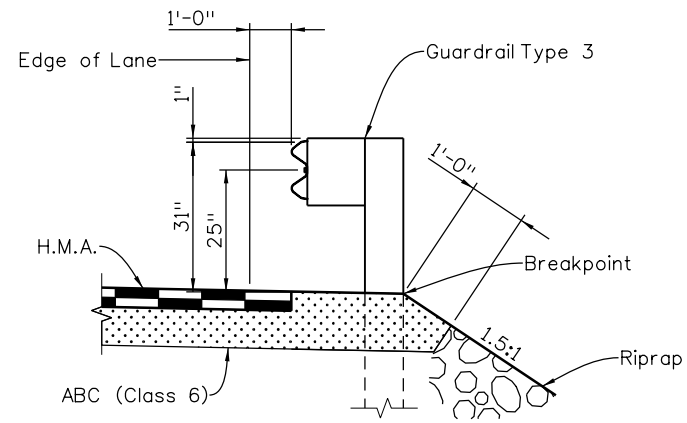


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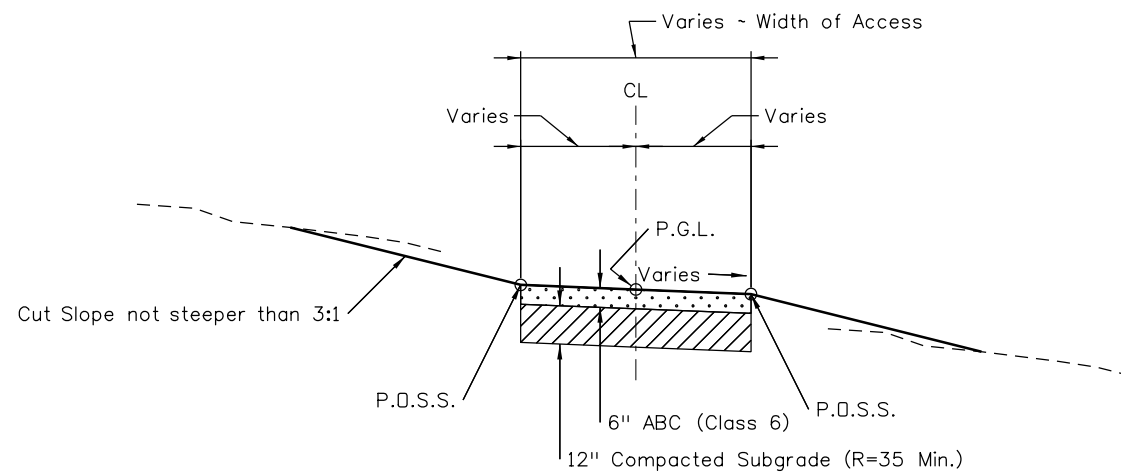
**RIVERSIDE DRIVE H.M.A. PAVEMENT SECTION**



- P.G.L. - Profile Grade Line
- H.M.A. - Hot Mix Asphalt
- H.P. - Hinge Point
- P.O.S.S. - Point of Slope Selection
- ⊕ - Minimum 4" Topsoil or Specified Alternative



(See CDDT Standard M-606-1 for additional Notes and Details)





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<b>FINAL</b>		CALL UTILITY NOTIFICATION CENTER OF COLORADO		CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES		REVISIONS: NO.    DATE    REVISION DESCRIPTION:   		<b>BOULDER COUNTY PUBLIC WORKS ENGINEERING DIVISION</b>				RIVERSIDE DR. STRUCTURE REPLACEMENT	
		DESIGNED: SEK	CAD/C3D: DWS	CHECKED: SEK	DATE: 7/17/2023			<b>ROADWAY TYPICAL SECTIONS</b>					
							PROJECT NO: <b>BC-103-009</b>		SHEET NO:		<b>3</b>		

**GENERAL NOTES**

- 1.) EXCEPT WHERE OTHERWISE PROVIDED FOR IN THESE PLANS AND SPECIFICATIONS, THE COLORADO DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION 2022 AND THE CURRENT STANDARD PLANS M&S STANDARDS, AND BOULDER COUNTY MULTIMODAL TRANSPORTATION STANDARDS SHALL APPLY.
- 2.) CONSTRUCTION CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONSTRUCTION CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS, AND CONSTRUCTION CONTRACTOR FURTHER AGREES TO DEFEND, INDEMNIFY AND HOLD THE DESIGN PROFESSIONAL, CDOT, AND BOULDER COUNTY HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE DESIGN PROFESSIONAL, CDOT, OR BOULDER COUNTY.
- 3.) REMOVAL OF THE EXISTING BRIDGE SHALL BE CONDUCTED IN A MANNER THAT DOES NOT REQUIRE HEAVY EQUIPMENT TO ENTER CAVE CREEK OR MIDDLE SAINT VRAIN CREEK, TO PROTECT WATER QUALITY AND REDUCE IMPACTS TO THE CREEK CHANNEL.
- 4.) FOR PRELIMINARY PLAN QUANTITIES OF PAVEMENT MATERIALS, THE FOLLOWING RATES OF APPLICATION WERE USED:  
TACKCOAT DILUTED EMULSIFIED ASPHALT (SLOW-SETTING) @ 0.10 GAL. PER SQ. YD. (DILUTED)  
HOT MIX ASPHALT @ 147 LBS. PER CU. FT.  
AGGREGATE BASE COURSE @ 135 LBS. PER CU. FT.  
MULCH TACKIFIER @ 200 LBS. PER ACRE
- 5.) DEPTH OF MOISTURE-DENSITY CONTROL FOR THIS PROJECT SHALL BE AS FOLLOWS:  
FULL DEPTH OF ALL EMBANKMENTS AND A.B.C. CLASS 6  
BASES OF CUTS AND FILLS 8 INCHES  
EXCAVATION REQUIRED FOR COMPACTION OF BASES OF CUTS AND FILLS WILL BE CONSIDERED AS SUBSIDIARY TO THAT OPERATION AND WILL NOT BE PAID FOR SEPARATELY.
- 6.) COMPACTION OF SOILS, AGGREGATE BASES, AND STRUCTURE BACKFILL SHALL BE DETERMINED BY CDOT STANDARD SPECIAL PROVISION, REVISION OF SECTION 203, 206, 304 AND 603 - COMPACTION.
- 7.) THE CONTRACTOR SHALL WORK WITHIN THE LIMITS OF THE PERMANENT R.O.W. AND TEMPORARY EASEMENTS INDICATED IN THE PLANS AND AS DIRECTED BY THE ENGINEER. EXCEEDING THESE WORK LIMITS THAT RESULTS IN DISTURBANCE GREATER THAN 1 ACRE WILL REQUIRE THE CONTRACTOR TO OBTAIN PERMITTING AND NPDES CONFORMANCE AT NO ADDITIONAL COST TO THE PROJECT. THE CONTRACTOR SHALL KEEP EQUIPMENT AND MATERIALS WITHIN THESE ESTABLISHED LIMITS.
- 8.) THE CONTRACTOR SHALL REMOVE THE EXISTING GRAVEL/ASPHALT ROADWAY SURFACING AND/OR EMBANKMENT MATERIAL TO THE LINE SHOWN ON THE TYPICAL SECTION. BLUE TOP STAKING SHALL BE PERFORMED BY THE CONTRACTOR.
- 9.) IN FILL SECTIONS, THE BASES UPON WHICH EMBANKMENT MATERIAL IS TO BE PLACED SHALL BE SCARIFIED TO A DEPTH OF 1'-0" AND THEN RECOMPACTED WITH MOISTURE AND DENSITY CONTROL. IN CUT SECTIONS, THE EARTH SHALL BE REMOVED FROM THE FULL WIDTH OF ROADBED TO THE DESIGNATED DEPTH AND THE EARTH SUBGRADE SHALL BE THOROUGHLY SCARIFIED TO A DEPTH OF 1'-0" AND THEN RECOMPACTED WITH MOISTURE AND DENSITY CONTROL. THE MOISTURE CONTENT OF THE SCARIFIED MATERIAL SHALL BE INCREASED OR DECREASED, AS NECESSARY, TO OBTAIN THE TYPE OF COMPACTION SPECIFIED. SCARIFICATION AND COMPACTION OF BASES OF CUTS AND FILLS WILL NOT BE PAID FOR SEPARATELY, BUT SHALL BE CONSIDERED SUBSIDIARY TO ROADWAY CONTRACT PAY ITEMS 203.
- 10.) ALL EMBANKMENT MATERIAL SHALL CONSIST OF MATERIAL WHICH IS A NON-EXPANSIVE, GRANULAR SOIL. EMBANKMENT MATERIAL SHALL HAVE A MINIMUM "R" VALUE OF 35. THE CONTRACTOR SHALL FURNISH EVIDENCE THAT THE EMBANKMENT MATERIAL FROM THE SITE OR OTHER SOURCES, FOR USE IN THE ROADWAY EMBANKMENT, MEETS THE REQUIREMENTS AND SHALL PAY FOR SUCH TESTS AS MAY BE REQUIRED TO SHOW COMPLIANCE.
- 11.) TOPSOIL WILL BE REQUIRED FOR FINAL ROADWAY SIDESLOPES AND BACKSLOPES AND GRADED AREAS THAT ARE NOT COVERED WITH RIPRAP. THE MINIMUM THICKNESS OF TOPSOIL SHALL BE 4 INCHES.
- 12.) SEEDING AND MULCHING WILL BE REQUIRED FOR ALL DISTURBED AREAS NOT SURFACED, INCLUDING ROADWAY EMBANKMENT, SITE GRADING AND CHANNEL SHAPING. SEED AND MULCH SHALL BE FURNISHED AND PLACED BY THE CONTRACTOR.
- 13.) BID ITEM 606, GUARDRAIL W-BEAM, THRIE BEAM AND END ANCHORS SHALL BE GALVANIZED.
- 14.) REFLECTOR TABS SHALL BE PLACED ON ALL GUARDRAIL IN ACCORDANCE WITH THE DETAILS INCLUDED IN CDOT STANDARD M-606-1, GUARDRAIL TYPE 3.
- 15.) DELINEATORS ARE REQUIRED AT APPROACH CORNERS OF BRIDGE. IT IS ESTIMATED THAT 4 DELINEATORS (TYPE III) WILL BE REQUIRED.
- 16.) DETOUR SIGNING, BARRICADES AND CONSTRUCTION SIGNING SHALL BE FURNISHED, INSTALLED, MAINTAINED AND REMOVED BY THE CONTRACTOR.
- 17.) THE CONTRACTOR SHALL MAINTAIN DRAINAGE DURING CONSTRUCTION. THIS WORK WILL NOT BE PAID FOR SEPARATELY, BUT WILL BE CONSIDERED A SUBSIDIARY OBLIGATION OF THE CONTRACTOR UNDER OTHER CONTRACT ITEMS.
- 18.) WASTE MATERIALS GENERATED BY THE CONTRACTOR SHALL BE DISPOSED OF BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE PROJECT. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN A DISPOSAL SITE FOR ALL UNUSABLE MATERIALS.
- 19.) EXISTING ROADWAY SIGNS WITHIN THE PROJECT LIMITS SHALL BE REMOVED BY THE CONTRACTOR PRIOR TO CONSTRUCTION OR REPLACED AS APPLICABLE. THIS WORK WILL BE MEASURED AND PAID FOR WITH ITEM NO. 202, REMOVAL OF GROUND SIGN AND 614, STEEL SIGN POST (2X2 INCH TUBING). ANY REMOVED SIGNS SHALL REMAIN THE PROPERTY OF BOULDER COUNTY.
- 20.) IT IS ESTIMATED THAT REMOVAL OF 2 GROUND SIGNS AND RESET OF 2 GROUND SIGNS WILL BE REQUIRED WITHIN THE PROJECT LIMITS AS DIRECTED BY THE ENGINEER.
- 21.) CONTRACTOR IS RESPONSIBLE FOR ACQUIRING A DEMOLITION AND/OR DEWATER PERMIT FROM CDPHE AND A BOULDER COUNTY STORMWATER QUALITY PERMIT.
- 22.) FOR CONCRETE TO BE PLACED ON THE PROJECT, THE SULFATE EXPOSURE LEVEL IS CLASS 0.
- 23.) CONTRACTOR SHALL COMPLY WITH THE MIGRATORY BIRD TREATY ACT OF 1918. BETWEEN APRIL 1 AND AUGUST 31 A SURVEY CONDUCTED BY BOULDER COUNTY OR OTHERS SHALL BE COMPLETED TO VERIFY THE ABSENCE OF ANY ACTIVE NESTS PRIOR TO ANY WORK ON OR UNDER THE BRIDGE OR ANY REMOVAL OF TREES OR SHRUBS. IF AN ACTIVE NEST(S) IS FOUND, NO WORK MAY BE DONE WITHIN 50' OF THE NEST(S) UNTIL THE NEST(S) BECOMES INACTIVE. TO AVOID THE SURVEY REQUIREMENT, IT IS RECOMMENDED THAT ALL VEGETATION THAT NEEDS TO BE REMOVED, BE REMOVED AFTER AUGUST 31 AND BEFORE APRIL 1.
- 24.) CLEARING AND GRUBBING OF VEGETATION THAT MAY DISTURB GROUND NESTING BIRDS SHALL BE COMPLETED BEFORE BIRDS BEGIN TO NEST OR AFTER THE YOUNG HAVE FLEDGED. IF WORK ACTIVITIES ARE PLANNED BETWEEN APRIL 1 AND AUGUST 31, VEGETATION SHALL BE REMOVED AND/OR TRIMMED TO A HEIGHT OF SIX (6) INCHES OR LESS PRIOR TO APRIL 1. ONCE VEGETATION HAS BEEN REMOVED AND/OR TRIMMED, APPROPRIATE MEASURES, I.E. REPEATED MOWING/TRIMMING, SHALL BE IMPLEMENTED TO ASSURE VEGETATION DOES NOT GROW MORE THAN SIX (6) INCHES. FAILURE TO MAINTAIN VEGETATION HEIGHT OF SIX (6) INCHES OR LESS MAY POSTPONE PROJECT CONSTRUCTION.
- 25.) FOR BIRDS OF PREY THAT COULD POTENTIALLY NEST NEAR THE PROJECT SITE, PLEASE CONTACT THE BOULDER COUNTY BIOLOGIST AND/OR REFER TO THE COLORADO PARKS AND WILDLIFE'S "RECOMMENDED BUFFER ZONES AND SEASONAL RESTRICTIONS FOR COLORADO RAPTORS" GUIDELINES AVAILABLE AT COLORADO PARKS AND WILDLIFE DISTRICT OFFICES.
- 26.) LOCATION OF STAGING AREAS, EQUIPMENT AND MATERIAL STORAGE ARE THE CONTRACTOR'S RESPONSIBILITY, AND MUST BE COORDINATED WITH THE PROPERTY OWNER. NO STAGING OR MATERIAL STORAGE IS ALLOWED IN THE FLOOD PLAIN WITHOUT A COUNTY APPROVED FLOOD PLAIN PERMIT.
- 27.) CONTRACTOR SHALL PROTECT ALL SURVEY AND RIGHT-OF-WAY MONUMENTATION DURING CONSTRUCTION OPERATIONS. ANY MONUMENTS DISTURBED BY THE CONSTRUCTION OPERATIONS SHALL BE RESET BY THE CONTRACTOR AT THEIR EXPENSE, IN ACCORDANCE WITH CDOT SPECIFICATIONS, SECTION 629, SURVEY MONUMENTATION.
- 28.) CONSTRUCTION SURVEYING INCLUDES ALL FIELD SURVEY STAKING AS REQUIRED FOR CONSTRUCTION OF THE PROJECT, INCLUDING LAYOUT FOR STRIPING AND PAVING MARKINGS.
- 29.) CONTRACTOR SHALL PROTECT EXISTING VEGETATION NOT DESIGNATED FOR REMOVAL, INSIDE AND OUTSIDE THE PROJECT AREA. DAMAGED VEGETATION UNDESIGNATED FOR REMOVAL, SHALL BE REPLACED WITH SIMILAR ITEMS AT THE CONTRACTOR'S EXPENSE.
- 30.) CONSTRUCTION INSPECTION AND MATERIAL TESTING WILL BE PROVIDED BY BOULDER COUNTY.
- 31.) CONTRACTOR SHALL LIMIT CONSTRUCTION ACTIVITIES TO THOSE AREAS WITHIN THE LIMITS OF DISTURBANCE. ANY DISTURBANCE BEYOND THOSE LIMITS SHALL BE RESTORED TO ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE. CONSTRUCTION ACTIVITIES SHALL ALSO INCLUDE VEHICLE AND EQUIPMENT PARKING, DISPOSAL OF LITTER, AND ANY OTHER ACTIVITY THAT WOULD ALTER EXISTING CONDITIONS.
- 32.) UNLESS OTHERWISE SPECIFIED, REMOVAL ITEMS SHALL BECOME THE PROPERTY OF THE CONTRACTOR. REMOVALS SHALL BE DISPOSED OF OUTSIDE OF THE PROJECT'S LIMITS, UNLESS OTHERWISE APPROVED BY THE ENGINEER.
- 33.) THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ASPECTS OF SAFETY INCLUDING, BUT NOT LIMITED TO, EXCAVATION, TRENCHING, SHORING, TRAFFIC CONTROL AND SECURITY. REFER TO OSHA PUBLICATION 2226, EXCAVATING AND TRENCHING.
- 34.) THE CONTRACTOR SHALL BE RESPONSIBLE FOR RECORDING AS-BUILT INFORMATION ON A SET OF RECORD DRAWINGS KEPT ON THE CONSTRUCTION SITE, AND AVAILABLE TO THE BOULDER COUNTY INSPECTOR AT ALL TIMES. THESE UPDATES SHALL BE DONE AS WORK PROGRESSES. PREPARATION OF AS-BUILT PLANS WILL NOT BE PAID FOR SEPARATELY. FINAL SIGN LOCATIONS SHALL BE PROVIDED IN CAD FORMAT AND SHALL BE INCLUDED IN THE WORK.
- 35.) UPON COMPLETION OF CONSTRUCTION, THE SITE SHALL BE CLEANED AND RESTORED TO A CONDITION EQUAL TO OR BETTER THAN, THAT WHICH EXISTED BEFORE CONSTRUCTION, OR TO THE GRADES AND CONDITION REQUIRED IN THESE PLANS.
- 36.) DISPOSAL OF EXCESS MATERIAL OFF-SITE OR THE IMPORTING OF MATERIALS ON-SITE, REGARDLESS OF PROPERTY OWNERSHIP, MUST BE DONE IN ACCORDANCE WITH ALL FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS AND POLICIES.
- 37.) ALL EXCESS MATERIAL GENERATED WITHIN THE PROJECT LIMITS SHALL BE REMOVED FROM THE PROJECT SITE AT NO ADDITIONAL COST TO THE PROJECT UNLESS SPECIFIED IN THE PLANS.
- 38.) A BOULDER COUNTY HAULER LICENSE IS REQUIRED FOR HAULING OF MATERIAL OFF SITE, REGARDLESS OF WHERE THE MATERIAL IS DEPOSITED. THIS APPLIES TO THE PRIME CONTRACTOR AS WELL AS ANY SUBCONTRACTORS THAT COLLECT, TRANSPORT OR DISPOSE OF DISCARDED MATERIALS (GARBAGE, RECYCLABLES OR COMPOSTABLES, CONSTRUCTION AND DEMOLITION WASTE, OR LANDSCAPING MATERIALS) IN UNINCORPORATED BOULDER COUNTY. SEE LINK OR ADDITIONAL INFORMATION: <https://www.bouldercounty.org/environment/trash/hauler-license/>.

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<b>FINAL</b>	 CALL UTILITY NOTIFICATION CENTER OF COLORADO CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES	REVISIONS: NO.    DATE    REVISION DESCRIPTION:	 <b>BOULDER COUNTY PUBLIC WORKS ENGINEERING DIVISION</b>				RIVERSIDE DR. STRUCTURE REPLACEMENT	
			DESIGNED: SEK CAD/C3D: DWS CHECKED: SEK DATE: 9-27-2022	<b>GENERAL NOTES</b>		PROJECT NO: <b>BC-103-009</b>	SHEET NO: <b>4</b>	

**SIGNING, STRIPING AND TRAFFIC CONTROL NOTES**

- 1.) CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING, INSTALLING, AND MAINTAINING THE REQUIRED CONSTRUCTION ZONE TRAFFIC CONTROL DEVICES AND PERSONNEL PER SPECIAL PROVISIONS, SECTION 630 OF THE STANDARD SPECIFICATIONS AND THE MUTCD. THE CONTRACTOR IS PROHIBITED FROM STARTING WORK AT ANY LOCATION IF A TRAFFIC CONTROL PLAN, INCLUDING BICYCLES AND PEDESTRIANS, HAS NOT BEEN SUBMITTED AND APPROVED BY THE BOULDER COUNTY ENGINEER OR TRAFFIC ENGINEER.
- 2.) CONTRACTOR SHALL PROVIDE SAFE, LOCAL ACCESS FOR ALL ADJACENT PROPERTY OWNERS, EMERGENCY SERVICES, SCHOOL BUSES, DELIVERIES, ETC. AT ALL TIMES.
- 3.) SIGN POSTS SHALL BE 2" X 2" X 10' (14 GAUGE) GALVANIZED PERFORATED SQUARE STEEL TUBING.
- 4.) SIGN POST BASES SHALL BE 2 1/4" X 2 1/4" (12 GAUGE, 3' IN LENGTH) GALVANIZED PERFORATED SQUARE STEEL TUBING.
- 5.) BASES SHALL BE INCLUDED IN THE COST FOR SIGN POSTS. TOP OF BASES SHALL BE 3"± ABOVE FINISHED GRADE. THE SIGN POST SHALL BE INSTALLED 4" IN TO THE BASE AND BOLTED BOTH WAYS.
- 6.) SIGN POST LOCATIONS SHALL BE APPROVED BY THE ENGINEER AND ROAD MAINTENANCE SIGN SHOP REPRESENTATIVE PRIOR TO INSTALLATION.
- 7.) THICKNESS OF ALL SIGN PANELS SHALL BE .100"
- 8.) FINAL PAVEMENT STRIPING SHALL BE EPOXY PER CDOT STANDARD SPECIFICATIONS AND SHALL MATCH EXISTING PAVEMENT MARKING CONFIGURATION.

**EROSION AND STORMWATER NOTES**

- 1.) A BOULDER COUNTY STORMWATER QUALITY PERMIT (SWQP) IS REQUIRED FOR THIS PROJECT BECAUSE IT IS WITHIN 100 HORIZONTAL FEET OF A PERMANENT PERENNIAL STREAM OR A MAIN IRRIGATION DITCH. FOR MORE INFORMATION ON QUALIFYING WATERWAYS AND PROJECTS, REFER TO THE GUIDANCE FOR SMALL CONSTRUCTION PROJECTS AVAILABLE ON THE BOULDER COUNTY PUBLIC WORKS DEPARTMENT WEBSITE. THE BOULDER COUNTY STORMWATER QUALITY PERMIT CAN BE ACQUIRED VIA: <https://www.bouldercounty.org/transportation/permits/stormwater-quality-permit/>
- 2.) A STATE CONSTRUCTION DEWATERING WASTEWATER DISCHARGE PERMIT IS REQUIRED ON THIS PROJECT SINCE DEWATERING WILL BE REQUIRED IN ORDER TO COMPLETE THE WORK AND WATER WILL BE DISCHARGED INTO A CHANNEL OR WATERS OF THE UNITED STATES. IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN THIS PERMIT. ALL COSTS ASSOCIATED WITH DEWATERING SHALL BE INCLUDED WITHIN THE DEWATERING PAY ITEM. A DETAILED DEWATERING PLAN SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW.
- 3.) THE CONTRACTOR SHALL PROTECT ALL WORK AREAS AND FACILITIES FROM WATER AT ALL TIMES. AREA AND FACILITIES SUBJECTED TO FLOODING, REGARDLESS OF THE SOURCE OF WATER SHALL BE PROMPTLY DEWATERED AND RESTORED AT NO COST TO THE OWNER. THIS SHALL INCLUDE REMOVAL OF ANY DEBRIS CAUSED BY FLOODING.
- 4.) ALL EROSION CONTROL MEASURES SHALL BE INSTALLED AT THE LIMITS OF CONSTRUCTION AND AT AREAS WITH DISTURBED SOIL, ON OR OFF SITE, PRIOR TO ANY OTHER GROUND DISTURBING ACTIVITY. ALL EROSION CONTROL MEASURES SHALL BE MAINTAINED IN GOOD REPAIR BY THE CONTRACTOR, UNTIL SUCH TIME AS THE ENTIRE DISTURBED AREAS ARE STABILIZED WITH HARD SURFACE OR LANDSCAPING. EROSION CONTROL MEASURES SHALL BE PLACED CONTINUALLY AS DRAINAGE FEATURES ARE BEING CONSTRUCTED.
- 5.) IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MAINTAIN EXISTING BMP'S AND ENSURE THEIR COMPLETE REMOVAL FROM THE PROJECT ONCE 70% OF THE PRE-EXISTING VEGETATION HAS BEEN RE-ESTABLISHED.
- 6.) SEE STORMWATER MANAGEMENT PLAN.

**BEST MANAGEMENT PRACTICES**

- 1.) CONTRACTOR/PERMITTEE SHALL PERIODICALLY INSPECT ALL INSTALLED BMPS, PROVIDE MAINTENANCE, AND MAKE REPAIRS AS NECESSARY TO PREVENT THEIR FAILURE.
- 2.) SILT FENCE OR AN EQUIVALENT SHALL BE PLACED AS PERIMETER CONTROL ON ALL CONSTRUCTION ACTIVITIES THAT OCCUR ON LAND. UNLESS OTHERWISE SPECIFIED IN THE CONTRACT DOCUMENTS, OR OTHERWISE REQUESTED, REMOVE PERIMETER CONTROLS WITHIN 30 DAYS AFTER THE DATE OF WARRANTY PERFORMANCE OF THE WORK OR IN ACCORDANCE WITH BMPS.
- 3.) VEHICLE TRACKING CONTROLS SHALL BE USED AT ALL VEHICLE AND EQUIPMENT ACCESS POINTS TO THE SITE TO PREVENT SEDIMENT EXITING THE PROJECT SITE ONTO PAVED PUBLIC ROADS. ACCESS SHALL BE PROVIDED ONLY AT LOCATIONS APPROVED BY THE ENGINEER. VEHICLE TRACKING CONTROL LOCATIONS SHALL BE RECORDED ON THE SWMP SITE MAP.
- 4.) ALL INLETS AND CULVERTS SHALL BE PROTECTED DURING ONSITE CONSTRUCTION ACTIVITIES. INLET PROTECTION LOCATIONS SHALL BE RECORDED ON THE SWMP SITE MAP.
- 5.) CONCRETE WASTED IN DESIGNATED DEWATERING AREAS SHALL BE COLLECTED, REMOVED FROM THE PROJECT SITE, AND DISPOSED OF PROPERLY. WASTED CONCRETE ALSO INCLUDES EXCESS CONCRETE REMOVED FROM FORMS, SPILLS, SLOP, AND ALL OTHER UNUSED CONCRETE THAT ENDS UP ON THE GROUND.
- 6.) THE CONTRACTOR/PERMITTEE MUST MAINTAIN A SPILL KIT ON SITE WHEN WORKING AROUND SURFACE WATERS. IF POLLUTANTS ARE SPILLED INTO ANY SURFACE WATERS DURING THE COURSE OF CONSTRUCTION ACTIVITIES, THE CONTRACTOR/PERMITTEE MUST NOTIFY THE OWNER'S REPRESENTATIVE OR ENGINEER IMMEDIATELY.

**WASTE MANAGEMENT**

- 1.) THE CONTRACTOR/PERMITTEE SHALL NOT BURN, BURY, OR OTHERWISE DISCHARGE CONSTRUCTION OR DEMOLITION WASTE ON THE SITE UNLESS SPECIFIED OTHERWISE.
- 2.) THE CONTRACTOR/PERMITTEE SHALL PROVIDE A PORTABLE TOILET AND ASSOCIATED MAINTENANCE SCHEDULE FOR THE CONSTRUCTION AREA SUFFICIENT TO ACCOMMODATE THE CONSTRUCTION CREW AND ALL OTHER AUTHORIZED PERSONS TO BE ONSITE DURING CONSTRUCTION ACTIVITIES.



**HAZARDOUS MATERIALS**

- 1.) THE CONTRACTOR/PERMITTEE SHALL TRANSPORT, USE, AND STORE HAZARDOUS MATERIALS IN ACCORDANCE WITH ALL REGULATORY REQUIREMENTS. SPILLED HAZARDOUS MATERIALS, INCLUDING HAZARDOUS LIQUID WASTES, SHALL BE REMOVED FROM THE SITE AND THE PROPERTY RESTORED TO ITS PRE--SPILL STATE IN ACCORDANCE WITH REGULATORY REQUIREMENTS.
- 2.) THE CONTRACTOR/PERMITTEE SHALL IMMEDIATELY REPORT SPILLS TO THE PROPER REGULATORY AUTHORITY AND SHALL IMMEDIATELY NOTIFY THE ENGINEER.
- 3.) HANDLING OF CONSTRUCTION FUELS AND LUBRICANTS:
  - A.) THE CONTRACTOR/PERMITTEE SHALL EMPLOY PERSONS QUALIFIED TO HANDLE CONSTRUCTION EQUIPMENT FUELS AND LUBRICANTS.
  - B.) THE CONTRACTOR/PERMITTEE SHALL REFUEL AND SERVICE EQUIPMENT AWAY FROM FLOODPLAINS OF RIVERS, STREAMS AND OTHER BODIES OF WATER. THE CONTRACTOR/PERMITTEE SHALL ENSURE EQUIPMENT THAT ENTERS THE WATER IS FREE FROM EXTERNAL GREASE, OIL, AND MUD.
  - C.) THE CONTRACTOR/PERMITTEE SHALL PREVENT HANDLING AND FUELING OPERATIONS FROM CONTAMINATING THE GROUND, SURFACE WATER, AND GROUND WATER. THE CONTRACTOR/PERMITTEE SHALL USE CONTAINMENT BERMS AND AN IMPERMEABLE BASE COURSE OR OTHER SYSTEM TO CONTAIN SPILLED FUEL.

**GENERAL CARE OF WATER**

- 1.) CARE OF WATER SHALL INCLUDE THE DESIGN OF ALL TEMPORARY CARE OF WATER PROVISIONS INCLUDING COFFER DAMS, SUMPS, PUMPING SYSTEMS, PIPELINES, CHANNELS, FLUMES, DRAINS, AND OTHER PROTECTIVE AND DEWATERING WORKS TO ALLOW FOR WORK TO BE PERFORMED UNDER DRY CONDITIONS.
- 2.) NO CONSTRUCTION EQUIPMENT SHALL BE OPERATED BELOW THE EXISTING WATER SURFACE UNLESS SPECIFICALLY AUTHORIZED BY THE STORMWATER QUALITY PERMIT ISSUED BY BOULDER COUNTY, AND ANY OTHER APPLICABLE LOCAL, STATE OR FEDERAL LICENSE OR PERMIT.
- 3.) THE CONTRACTOR/PERMITTEE IS RESPONSIBLE FOR ALL CARE OF WATER INCLUDING BUT NOT LIMITED TO DESIGNING, SUPPLYING, CONSTRUCTING, OPERATING, AND REMOVING ALL CARE OF WATER PROVISION INCLUDING COFFER DAMS AND SEDIMENT REMOVAL SYSTEMS; DESIGNING, SUPPLYING, INSTALLING, MAINTAINING, AND REMOVING PROTECTIVE WORKS FOR WINTER OPERATIONS OF CARE OF WATER SYSTEMS.
- 4.) THE CONTRACTOR/PERMITTEE SHALL COMPLY WITH ALL USACE 404 PERMIT REQUIREMENTS INCLUDING ANY SPECIAL CARE REQUIREMENTS ISSUED FOR THIS PROJECT.
- 5.) WHEN REQUIRED THE CONTRACTOR/PERMITTEE SHALL DESIGN TEMPORARY STREAM DIVERSIONS TO FACILITATE UPSTREAM FISH PASSAGE. INSTREAM VELOCITIES SHALL BE LIMITED TO 7 FT/SEC WHEN THIS PROVISION IS REQUIRED.
- 6.) CARE OF WATER SHALL INCLUDE PROVISIONS FOR HANDLING GROUNDWATER, RAINSTORM RUNOFF, SNOW, SNOWMELT, AND ICE THAT MAY ENTER THE WORK AREA.
- 7.) PROTECTIVE WORKS SHALL BE DESIGNED BY THE CONTRACTOR/PERMITTEE AS NECESSARY TO INCLUDE ENCLOSURES, INSULATION, AND HEATING SYSTEMS TO ENSURE THAT DEWATERING SYSTEMS OPERATE CONTINUOUSLY AND DO NOT BECOME FROZEN DURING COLD WEATHER.
- 8.) THE CONTRACTOR/PERMITTEE SHALL PROVIDE AND MAINTAIN SEDIMENT PONDS OR OTHER MEANS, REMOVE SEDIMENT FROM WATERS COLLECTED WITHIN ACTIVE CONSTRUCTION AREAS PRIOR TO ALLOWING IT TO ENTER OR RETURN INTO THE WATERCOURSE. CONTRACTOR/PERMITTEE SHALL DISPOSE OF SEDIMENTS IN A SUITABLE OFF-SITE WASTE DISPOSAL FACILITY.
- 9.) THE CONTRACTOR/PERMITTEE SHALL MONITOR WATER TURBIDITY DURING CONSTRUCTION ACTIVITIES AND SHALL SHUT DOWN WORKS AT TIMES OF EXCESS TURBIDITY IN ORDER TO ALLOW THE WATER TO CLEAR PRIOR TO RE-COMMENCEMENT OF IN-STREAM WORK.
- 10.) TURBIDITY IS EXPECTED DURING PLACEMENT AND REMOVAL OF WATER CONTROL. IF WATERS BECOME NOTICEABLY TURBID, CONTRACTOR/PERMITTEES SHOULD PROMPTLY HALT OPERATIONS TO ALLOW WATERS TO CLEAR PRIOR TO RESUMING OPERATIONS. FURTHERMORE, SHUTDOWNS FOR SILTY OR TURBID WATER MAY BE SPECIFIED BY THE ENGINEER OR THE OWNER'S REPRESENTATIVE, AT THEIR DISCRETION.
- 11.) IN THE EVENT OF UNSCHEDULED CONSTRUCTION ACTIVITY THAT RESULTS IN A VISUALLY CONSPICUOUS PLUME OF SEDIMENT, CONTRACTOR/PERMITTEE SHALL IMMEDIATELY NOTIFY THE ENGINEER AND UNDERTAKE MITIGATION ACTIONS NECESSARY TO COMPLY WITH THE SPECIFIED CLEAN WATER CRITERIA.

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<b>FINAL</b>	 CALL UTILITY NOTIFICATION CENTER OF COLORADO CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES	NO.	DATE	REVISION DESCRIPTION:	 <b>BOULDER COUNTY PUBLIC WORKS ENGINEERING DIVISION</b>	RIVERSIDE DR. STRUCTURE REPLACEMENT	
		REVISIONS:				DESIGNED: SEK    CAD/C3D: DWS    CHECKED: SEK    DATE: 9-27-2022	<b>GENERAL NOTES</b>
						PROJECT NO: <b>BC-103-009</b>	SHEET NO: <b>5</b>

**HEAVY EQUIPMENT OPERATIONS AND MAINTENANCE**

- 1.) EQUIPMENT OPERATED BELOW THE ORDINARY HIGH WATER MARK OF THE RIVER CHANNEL, MUST BE INSPECTED AND CLEAN OF FUEL, LUBRICANT LEAKS, AND INVASIVE AQUATIC SPECIES.
- 2.) TO MINIMIZE THE SPREAD OF INVASIVE SPECIES, ALL EQUIPMENT SHALL BE POWER-WASHED AND FREE OF WEEDS PRIOR TO ITS DELIVERY TO THE PROJECT AREA. IF EQUIPMENT WAS USED IN ANOTHER WET AREA WITHIN 10 DAYS OF INITIATING WORK, DECONTAMINATION PRACTICES SHOULD BE EMPLOYED TO MINIMIZE THE SPREAD OF DIDYMO SPHENIA, NEW ZEALAND MUD SNAILS, WHIRLING DISEASE, ZEBRA MUSSELS, AND OTHER AQUATIC HITCHHIKERS.
- 3.) READILY BIODEGRADABLE HYDRAULIC FLUIDS OR BIO-HYDRAULIC FLUIDS SHALL BE UTILIZED FOR ALL EQUIPMENT OPERATING IN WATER OR BELOW THE HIGH WATER MARK AND SHALL NOT HAVE A MINERAL OIL BASE. THE CONTRACTOR SHALL SUBMIT CERTIFICATION OF THE USE OF NON-TOXIC, READILY BIODEGRADABLE HYDRAULIC FLUIDS FOR EQUIPMENT OPERATED IN WATER TO THE ENGINEER AND OWNER FOR APPROVAL PRIOR TO USE.
- 4.) ALL EQUIPMENT WITH BIO-HYDRAULIC FLUIDS SHALL BE VISIBLY MARKED AND READILY IDENTIFIABLE AT A DISTANCE OF 100-FT. BASE OIL IS PREFERRED IN THE FOLLOWING ORDER: VEGETABLE OIL PREFERRED OVER SYNTHETIC ESTERS OR POLYALKYLENE GLYCOLS. BIO-HYDRAULIC FLUIDS THAT HAVE HAD MORE TESTING COMPLETED FOR SECTION 12 OF THE SDS DATA SHEET FOR EPA VGP EAL COMPLIANT OR EU ECOLABEL COMPLIANCE ARE PREFERRED OVER NO DATA AVAILABLE.
- 5.) ACCEPTABLE READILY BIODEGRADABLE FLUIDS WILL MEET THE FOLLOWING CRITERIA IN SECTION 12 OF THE SDS DATA SHEETS (ANY EXCEPTIONS MUST BE APPROVED BY THE OWNER.)
  - A. AQUATIC/ECOTOXICITY: BASED ON PREVIOUS STUDIES, LC50/EC50 IS GREATER THAN 3,000 PPM (3000 MG/L) (AMOUNT OF SUBSTANCE THAT KILLS 50 PERCENT OF THE TEST ANIMALS IN A GIVEN TIME).
  - B. BIODEGRADATION: ULTIMATE BIODEGRADATION IS LISTED AS "READILY BIODEGRADABLE" >60% AFTER 28 DAYS (INHERENTLY BIODEGRADABLE IS NOT SUFFICIENT).
  - C. PERSISTENCE AND DEGRADABILITY: READILY BIODEGRADABLE >60% AFTER 28 DAYS.
  - D. BIOACCUMULATION: NON-BIOACCUMULATING. THE BASE OIL SHALL NOT BE MINERAL OIL.



**AQUATIC NUISANCE SPECIES AND NOXIOUS WEED PROTOCOL**

- 1.) NO EQUIPMENT SHALL BE MOBILIZED TO THE WORK SITE UNLESS ONE OF THE FOLLOWING MEASURES ARE TAKEN TO PREVENT THE SPREAD OF NOXIOUS AND INVASIVE SPECIES INCLUDING AQUATIC NUISANCE SPECIES (ANS):
  - A. REMOVE ALL SOIL, PLANT AND ANIMAL MATERIAL, AND DEBRIS FROM EQUIPMENT (TRACKS, TIRES, UNDERCARRIAGES, TURRETS, BUCKETS, DRAGS, TEETH ETC.) AND SPRAY/ SOAK EQUIPMENT WITH A 1:1 SOLUTION OF FORMULA 409 HOUSEHOLD CLEANER AND WATER, KEEPING EQUIPMENT WET FOR AT LEAST 10 MINUTES, OR
  - B. REMOVE ALL SOIL, PLANT AND ANIMAL MATERIAL, AND DEBRIS FROM EQUIPMENT (TRACKS, TIRES, UNDERCARRIAGES, TURRETS, BUCKETS, DRAGS, TEETH ETC.) AND SPRAY/SOAK EQUIPMENT WITH WATER 120-140 DEGREES F FOR AT LEAST 10 MINUTES.
- 2.) PRIOR TO MOVING SUCH EQUIPMENT ONTO THE PROJECT, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER A WRITTEN LIST OF THE EQUIPMENT AND A SIGNED CERTIFICATION THAT IT WAS TREATED USING ONE OF THE TWO METHODS SPECIFIED ABOVE. INSPECTION BY COUNTY OF ALL PREVIOUSLY USED EQUIPMENT IS HIGHLY RECOMMENDED AT THE CLEANING LOCATION, OR AT THE WORK PROPERTY BOUNDARY (NOT RECOMMENDED DUE TO HIGH CHANCE OF REJECTION). NEW (CLEAN) EQUIPMENT CAN BE AN EXCEPTION TO THE CLEANING REQUIREMENTS, AS APPROVED BY COUNTY, BUT MUST STILL BE INSPECTED AT THE WORK PROPERTY BOUNDARY AT MINIMUM. EQUIPMENT REMOVED FROM THE PROJECT BOUNDARY AND SEEKING RE-ENTRY WILL NEED TO BE CLEANED AGAIN FOLLOWING ONE OF THE TWO METHODS ABOVE. AFTER PROJECT COMPLETION, THIS EQUIPMENT SHALL BE TREATED PRIOR TO ITS USE IN ANOTHER STREAM, RIVER, LAKE, POND OR WETLAND.

**UTILITY NOTES**



- 1.) THE LOCATION OF UTILITY FACILITIES AS SHOWN ON THE PLAN SHEETS, AND HEREIN DESCRIBED, WERE OBTAINED FROM THE BEST AVAILABLE INFORMATION.
- 2.) THE CONTRACTOR IS RESPONSIBLE FOR MAKING THEIR OWN DETERMINATION AS TO THE TYPE AND LOCATION OF ABOVE GROUND AND UNDERGROUND UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERETO. THE CONTRACTOR'S ATTENTION IS DIRECTED TO PARAGRAPH 105.11 OF THE STANDARD SPECIFICATIONS CONCERNING UTILITIES.
- 3.) THE CONTRACTOR SHALL COMPLY WITH ARTICLE 1.5 OF TITLE 9, CRS ("EXCAVATION REQUIREMENTS") WHEN EXCAVATION OR GRADING IS PLANNED IN THE AREA OF UNDERGROUND UTILITY FACILITIES. THE CONTRACTOR SHALL NOTIFY ALL AFFECTED UTILITIES AT LEAST THREE (3) BUSINESS DAYS PRIOR TO COMMENCING SUCH OPERATIONS. CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO (UNCC) TO HAVE LOCATIONS OF UNCC REGISTERED LINES MARKED BY MEMBER COMPANIES. CONTACT THE UNCC AT 1-800-922-1987 AT LEAST 3 DAYS (NOT INCLUDING THE DAY OF NOTIFICATION) PRIOR TO ANY EXCAVATION OR OTHER EARTHWORK. ALL OTHER UNDERGROUND FACILITIES SHALL BE LOCATED BY CONTACTING THE RESPECTIVE COMPANY. UTILITY SERVICE LATERALS SHALL ALSO BE LOCATED PRIOR TO BEGINNING EXCAVATING OR GRADING.
- 4.) THE CONTRACTOR SHALL HAVE THE RESPONSIBILITY OF PROTECTING LIVE UTILITIES DURING THEIR CONSTRUCTION OPERATIONS AND SHALL HOLD THE COUNTY HARMLESS FOR ANY AND ALL DAMAGES TO LIVE UTILITIES ARISING FROM THEIR CONSTRUCTION OPERATIONS.
- 5.) ALL COSTS INCIDENTAL TO THE FOREGOING REQUIREMENTS WILL NOT BE PAID FOR SEPARATELY BUT SHALL BE INCLUDED IN THE WORK.
- 6.) UTILITY CONTACTS: REFER TO SUE DRAWINGS

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<b>FINAL</b>	 CALL UTILITY NOTIFICATION CENTER OF COLORADO CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES	REVISIONS: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">NO.</th> <th style="width: 10%;">DATE</th> <th style="width: 80%;">REVISION DESCRIPTION:</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>	NO.	DATE	REVISION DESCRIPTION:										 <b>BOULDER COUNTY PUBLIC WORKS ENGINEERING DIVISION</b>	RIVERSIDE DR. STRUCTURE REPLACEMENT <b>GENERAL NOTES</b>
	NO.	DATE	REVISION DESCRIPTION:													
DESIGNED: <b>SEK</b> CAD/C3D: <b>DWS</b> CHECKED: <b>SEK</b> DATE: <b>6/8/2023</b>	PROJECT NO: <b>BC-103-009</b> SHEET NO: <b>6</b>															

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INDEX			CONTRACT ITEM NO.	CONTRACT ITEM	UNIT	Roadway		Channel		Bridge		PROJECT TOTALS		
BOOK	PAGE	SHEET				PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	
			201-00000	Clearing and Grubbing	L S	1							1	
			202-00010	Removal of Tree	EACH	4							4	
			202-00220	Removal of Asphalt Mat (5")	SY	540							540	
			202-00400	Removal of Bridge	EACH					1			1	
			202-00810	Removal of Ground Sign	EACH	2							2	
			203-00000	Unclassified Excavation	CY	170							170	
			203-00060	Embankment Material (Complete In Place)	CY	280							280	
			203-01500	Blading	HOUR	20							20	
			206-00000	Structure Excavation	CY					144			144	
			206-00100	Structure Backfill (Class 1)	CY					80			80	
			206-00200	Structure Backfill (Class 2)	CY					40			40	
			206-00510	Filter Material (Class A)	CY			50					50	
			206-01600	Temporary Excavation Support	L S					1			1	
			207-00700	Topsoil (Onsite)	CY	45							45	
			207-00703	Topsoil (Wetland)	CY	12							12	
			207-00704	Subgrade Soil Preparation	SY	418							418	
			208-00002	Erosion Log (Type 1) (Biodegradable) (12 Inch)	LF	100							100	
			208-00020	Silt Fence	LF	425							425	
			208-00035	Aggregate Bag	LF	50							50	
			208-00041	Rock Check Dam	EACH	1							1	
			208-00046	Pre-fabricated Concrete Washout Structure	EACH	1							1	
			208-00070	Vehicle Tracking Pad	EACH	2							2	
			208-00207	Erosion Control Management	DAY	20							20	
			208-00301	Temporary Diversion	L S			1					1	
			210-00810	Reset Ground Sign	EACH	2							2	
			211-03005	Dewatering	L S	1							1	
			212-00700	Organic Fertilizer	LB	27							27	
			212-00701	Compost (Mechanically Applied)	CY	6							6	
			212-00703	Humate	LB	18							18	
			212-00704	Mycorrhize	LB	1							1	



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		DESIGNED: SEK	CAD/C3D: DWS	CHECKED: SEK		DATE: 7/17/2023	<b>SUMMARY OF APPROXIMATE QUANTITIES</b>
					PROJECT NO: <b>BC-103-009</b>	SHEET NO: <b>7</b>	



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INDEX			CONTRACT ITEM NO.	CONTRACT ITEM	UNIT	Roadway		Channel		Bridge		PROJECT TOTALS		
BOOK	PAGE	SHEET				PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	
			212-00708	Seeding (Native) Broadcast	ACRE	0.1							0.1	
			213-00002	Mulching (Weed Free Hay)	ACRE	0.1							0.1	
			213-00061	Mulch Tackifier	LB	18							18	
			216-00222	Soil Retention Blanket (Coconut) (Biodegradable Class 2)	SY	225							225	
			304-06000	Aggregate Base Course (Class 6)	TON	260							260	
			403-34621	Hot Mix Asphalt (Grading SX) (50) (PG 58-28)	TON	122							122	
			506-00209	Riprap (9 Inch)	CY			130					130	
			515-00120	Waterproofing (Membrane)	SY					65			65	
			601-03030	Concrete Class D (Box Culvert)	CY					36			36	
			601-40300	Structural Concrete Coating	SY					50			50	
			* 602-00020	Reinforcing Steel (Epoxy Coated)	LB					3,525			3,525	
			602-10000	Drill and Grout Rebar	EACH					140			140	
			603-71407	14x7 Foot Concrete Box Culvert (Precast)	LF					33			33	
			606-00301	Guardrail Type 3 (6-3 Post Spacing)	LF	18.75							18.75	
			606-01370	Transition Type 3G	EACH	1							1	
			606-01380	Transition Type 3H	EACH	1							1	
			606-02003	End Anchorage (Nonflared)	EACH	2							2	
			606-10200	Bridge Rail (Special)	LF					48			48	
			607-11525	Fence (Plastic)	LF	760							760	
			612-00003	Delineator (Type III)	EACH	4							4	
			614-00216	Steel Sign Post (2x2 Inch Tubing)	LF	18							18	
			620-00001	Field Office (Class 1)	EACH	1							1	
			620-00020	Sanitary Facility	EACH	1							1	
			621-00411	Construction Access	L S	1							1	
			625-00000	Construction Surveying	L S	1							1	
			626-00000	Mobilization	L S	1							1	
			627-00005	Epoxy Pavement Marking	GAL	4							4	
			630-00000	Flagging	HOUR	160							160	
			630-00007	Traffic Control Inspection	DAY	4							4	
			630-00012	Traffic Control Management	DAY	140							140	

\* Reinforcing Steel Quantity is for cast-in-place concrete only. For precast concrete box culvert, reinforcing is included in the item and not quantified separately.

<b>FINAL</b>	 <small>CALL UTILITY NOTIFICATION CENTER OF COLORADO</small> <small>CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES</small>	NO.	DATE	REVISION DESCRIPTION:	 <b>BOULDER COUNTY PUBLIC WORKS</b> <b>ENGINEERING DIVISION</b>	RIVERSIDE DR. STRUCTURE REPLACEMENT	
		DESIGNED: SEK	CAD/C3D: DWS	CHECKED: SEK		DATE: 7/17/2023	<b>SUMMARY OF APPROXIMATE QUANTITIES</b>
					PROJECT NO: <b>BC-103-009</b>	SHEET NO: <b>8</b>	

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INDEX			CONTRACT ITEM NO.	CONTRACT ITEM	UNIT	Roadway		Channel		Bridge		PROJECT TOTALS	
BOOK	PAGE	SHEET				PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.		
			630-80338	Barricade (Type 3 M-D) (Temporary)	EACH	4						4	
			630-80341	Construction Traffic Sign (Panel Size A)	EACH	15						15	
			630-80342	Construction Traffic Sign (Panel Size B)	EACH	8						8	
			630-80355	Portable Message Sign Panel	EACH	3						3	
			630-80440	Portable Rumble Strips (Temporary)	EACH	4						4	
			700-70010	F/A Minor Contract Revisions	F A	0.33		0.33		0.34			1
			700-70380	F/A Erosion Control	F A	0.33		0.33		0.34			1

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SUMMARY OF EARTHWORK QUANTITIES			
<b>FOR PAY QUANTITY</b>			
<b>EMBANKMENT MATERIAL (COMPLETE IN PLACE)</b>		<u>CUBIC YARDS</u>	
ROADWAY		280	BCY
<b>TOTAL FOR PAY QUANTITY</b>		<b>280</b>	<b>BCY</b>
<b>FOR INFORMATION ONLY</b>			
<b>EARTHWORK QUANTITIES BALANCE</b>			
<b>EXCAVATION (SHRINK 0.85)</b>		<u>CUBIC YARDS</u>	
ROADWAY		174	CCY
<b>TOTAL</b>		<b>174</b>	<b>CCY</b>
<b>EMBANKMENT</b>			
ROADWAY		280	CCY
<b>TOTAL</b>		<b>280</b>	<b>CCY</b>
<b>BORROW</b>			
<b>TOTAL</b>		<b>106</b>	<b>CCY</b>
<b>COMPACTION</b>		<u>CUBIC YARDS</u>	
ROADWAY		280	CCY
BASES OF CUTS AND FILLS		262	CCY
<b>TOTAL</b>		<b>542</b>	<b>CCY</b>
<b>WATER FOR COMPACTION (0.04 MGAL/CUBIC YARD)</b>			
<b>TOTAL</b>		<b>22</b>	<b>MGAL</b>

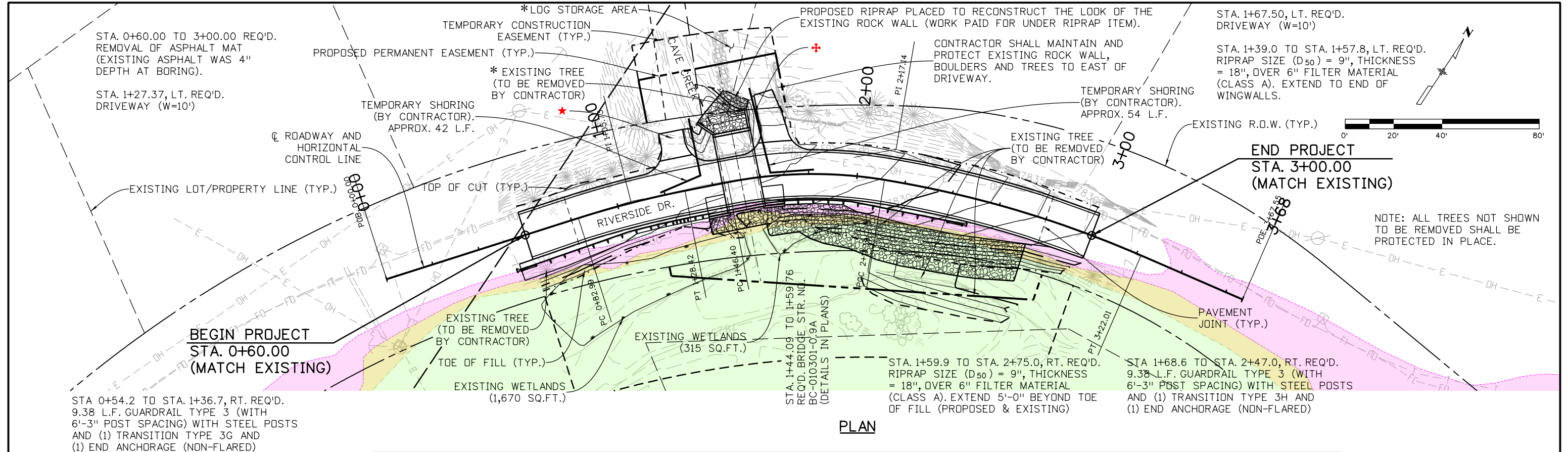
BCY - BANK CUBIC YARD - ONE CUBIC YARD OF MATERIAL AS IT LIES IN THE NATURAL STATE  
 CCY - COMPACTED CUBIC YARD - ONE CUBIC YARD OF MATERIAL AFTER IT HAS BEEN COMPACTED TO SPECIFICATION.  
 MGAL - 1,000 GALLONS

SURFACING SUMMARY					
LOCATION (STATION TO STATION)	SIDE	304-06000	403-34621	403-34621	COMMENTS
		Aggregate Base Course (Class 6)	Hot Mix Asphalt (Grading SX) (50) (PG 58-28)	Hot Mix Asphalt (Grading SX) (50) (PG 58-28)	
			2 IN. TOP LIFT	2 IN. BOTTOM LIFT	
			TON	TON	
<b>RIVERSIDE DR.</b>					
ACCESS ROADS	LT	21			
UNDER STRUCTURE (STA 0+60 TO 3+00)	LT,RT	30	61	61	
<b>SUB-TOTALS</b>		<b>260</b>	<b>61</b>	<b>61</b>	
<b>TOTALS</b>		<b>260</b>	<b>122</b>		

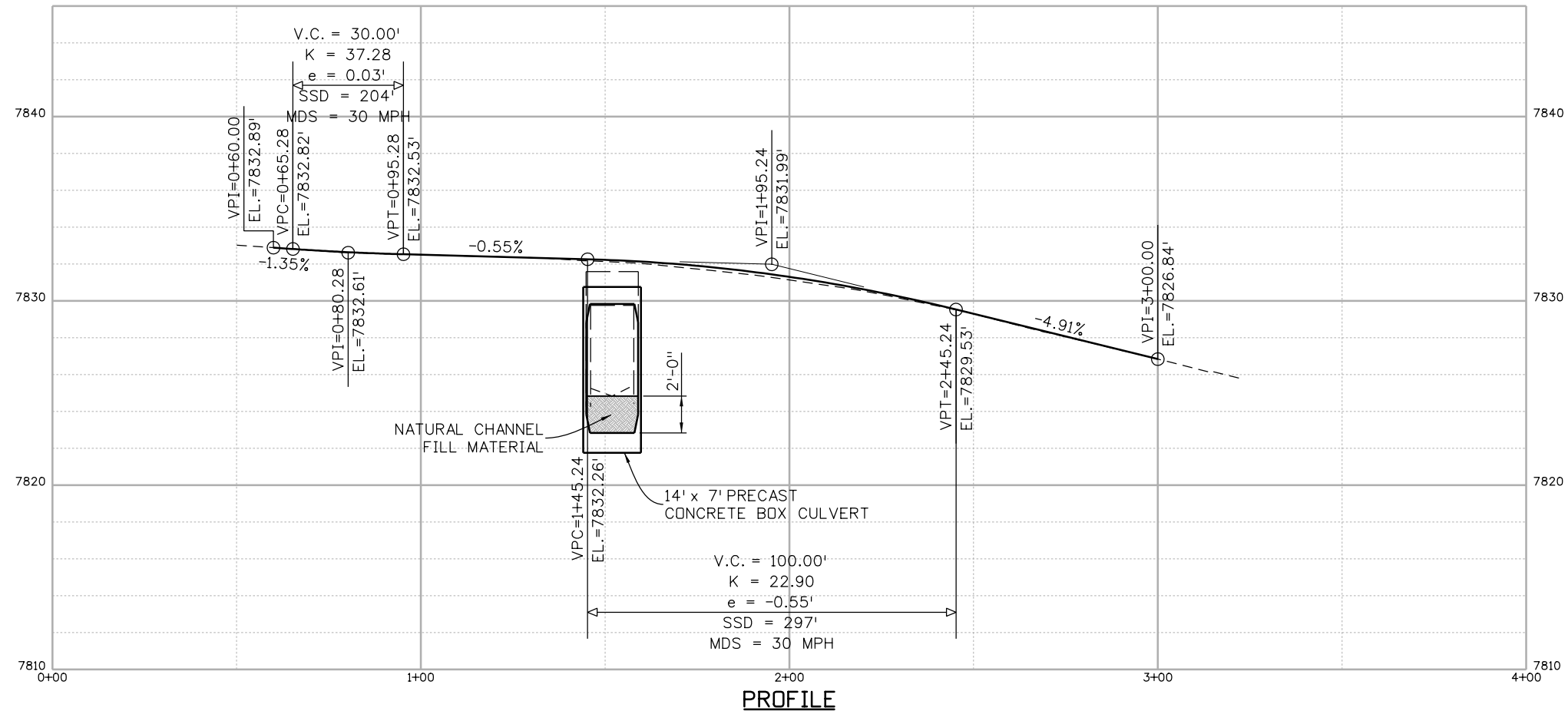
TABULATION OF GUARDRAIL						
Station		Side	606-00301	606-01370	606-01380	606-02003
			Guardrail Type 3 (6-3 Post Spacing)	Transition Type 3G	Transition Type 3H	End Anchorage (Nonflared)
From	To		LF	EACH	EACH	EACH
0+54.2	1+36.7	RT	9.38	1		1
1+68.6	2+47.0	RT	9.38		1	1
<b>Project Totals</b>			<b>18.75</b>	<b>1</b>	<b>1</b>	<b>2</b>

TABULATION OF REMOVALS			
STATION	SIDE	202-00220	202-00400
		Removal of Asphalt Mat	Removal of Bridge
		SY	EACH
0+60 TO 3+00	LT. & RT.	540	
1+42.3 TO 1+63.7	LT. & RT.		1
<b>PROJECT TOTALS</b>		<b>540</b>	<b>1</b>

TABULATION OF PAVEMENT MARKINGS			
STATION	SIDE	627.00005	
		Epoxy Pavement Marking	Epoxy Pavement Marking
		GAL (YELLOW)	GAL (WHITE)
<b>Riverside Dr.</b>			
0+60 to 3+00	LT.		1
0+60 to 3+00	RT.		1
0+60 to 3+00	CTR.	2	
<b>TOTALS</b>		<b>2</b>	<b>2</b>



PLAN



PROFILE

\* THIS TREE SHALL BE CUT DOWN INTO 4 FOOT LOGS, AND MOVED TO THE NORTH OF THE CONSTRUCTION AREA BETWEEN DRIVEWAY AND CREEK. BRANCHES AND TREE DEBRIS SHALL BE REMOVED. THIS WORK IS INCLUDED WITH TREE REMOVAL ITEM.

+ CONTRACTOR SHALL REMOVE AND REPLACE IN KIND EXISTING PROPERTY ADDRESS SIGN. THIS ITEM IS NOT PAID FOR SEPARATELY, BUT INCLUDED IN THE PROJECT WORK.

\* CONTRACTOR SHALL REMOVE AND REPLACE IN KIND EXISTING POST AND CHAIN GATE. THIS ITEM IS NOT PAID FOR SEPARATELY, BUT INCLUDED IN THE PROJECT WORK.

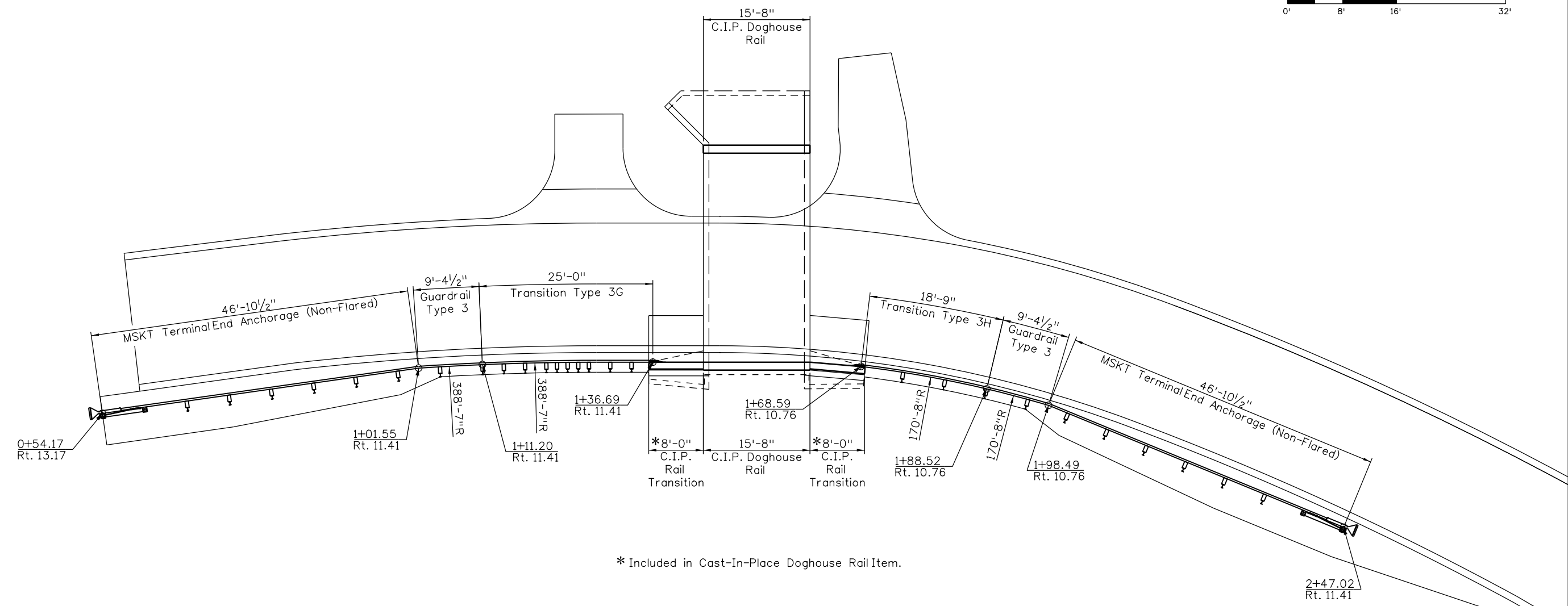
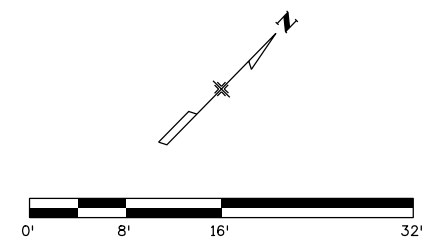
**LEGEND**

- FLOODPLAIN - BOULDER COUNTY REGULATED 0.2%
- FLOODPLAIN - BOULDER COUNTY REGULATED ZONE AE
- FLOODPLAIN - BOULDER COUNTY REGULATED ZONE A

<b>FINAL</b>		CALL UTILITY NOTIFICATION CENTER OF COLORADO		CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES		REVISIONS:		NO. DATE REVISION DESCRIPTION:			<b>BOULDER COUNTY PUBLIC WORKS ENGINEERING DIVISION</b>		RIVERSIDE DR. STRUCTURE REPLACEMENT	
		DESIGNED: SEK	CAD/C3D: DWS	CHECKED: SEK	DATE: 7/17/2023	<b>PLAN AND PROFILE GRADE</b>		PROJECT NO: BC-103-009	SHEET NO: 11					

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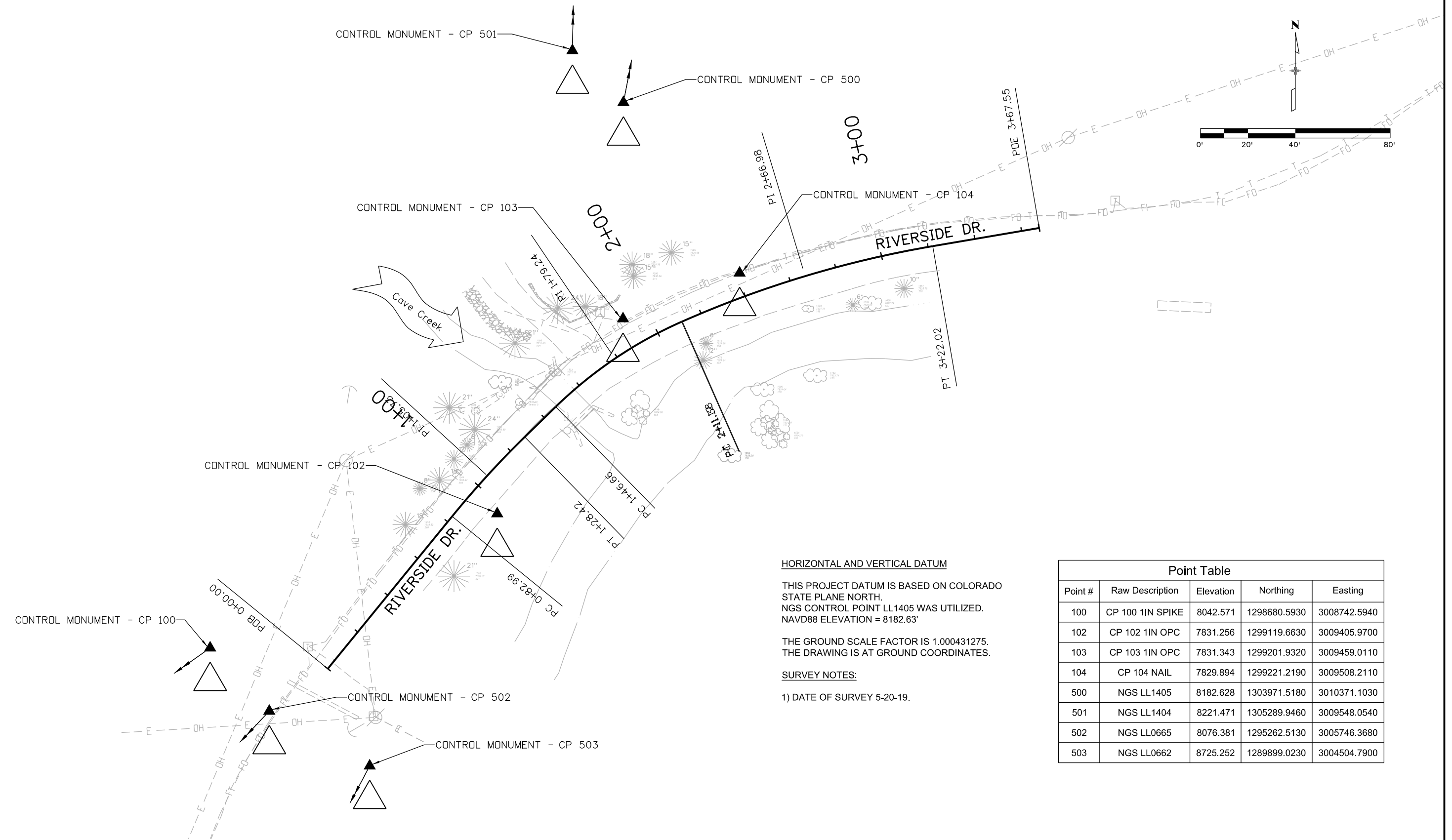
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\* Included in Cast-In-Place Doghouse Rail Item.

<b>FINAL</b>	 <small>CALL UTILITY NOTIFICATION CENTER OF COLORADO CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES</small>	<small>NO.</small>	<small>DATE</small>	<small>REVISION DESCRIPTION:</small>	 <b>BOULDER COUNTY PUBLIC WORKS ENGINEERING DIVISION</b>	<small>RIVERSIDE DR. STRUCTURE REPLACEMENT</small>	
		<small>DESIGNED:</small> SEK	<small>CAD/C3D:</small> DWS	<small>CHECKED:</small> SEK		<small>DATE:</small> 9-27-2022	<b>GUARDRAIL LAYOUT</b>

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**HORIZONTAL AND VERTICAL DATUM**

THIS PROJECT DATUM IS BASED ON COLORADO STATE PLANE NORTH. NGS CONTROL POINT LL1405 WAS UTILIZED. NAVD88 ELEVATION = 8182.63'

THE GROUND SCALE FACTOR IS 1.000431275. THE DRAWING IS AT GROUND COORDINATES.

**SURVEY NOTES:**

- 1) DATE OF SURVEY 5-20-19.

Point Table				
Point #	Raw Description	Elevation	Northing	Easting
100	CP 100 1IN SPIKE	8042.571	1298680.5930	3008742.5940
102	CP 102 1IN OPC	7831.256	1299119.6630	3009405.9700
103	CP 103 1IN OPC	7831.343	1299201.9320	3009459.0110
104	CP 104 NAIL	7829.894	1299221.2190	3009508.2110
500	NGS LL1405	8182.628	1303971.5180	3010371.1030
501	NGS LL1404	8221.471	1305289.9460	3009548.0540
502	NGS LL0665	8076.381	1295262.5130	3005746.3680
503	NGS LL0662	8725.252	1289899.0230	3004504.7900

<b>FINAL</b>	 <small>CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES</small>	NO.	DATE	REVISION DESCRIPTION:	 <b>BOULDER COUNTY PUBLIC WORKS ENGINEERING DIVISION</b>	RIVERSIDE DR. STRUCTURE REPLACEMENT	
		DESIGNED:	CAD/C3D:	CHECKED:		DATE:	PROJECT NO: <b>BC-103-009</b>
		SEK	DWS	SEK	9-27-2022		

**TO ESTABLISH GEOMETRIC CONTROL FOR THE CONSTRUCTION OF THIS PROJECT, THE DEPARTMENT HAS PROVIDED THE FOLLOWING INFORMATION:**

- Format \*
- 3D Design Modeling Electronic Files \_\_\_\_\_
  - Horizontal Control Plan Sheet
  - Vertical Control Plan Sheet
  - Roadway Alignment Plan Sheet
  - Original Terrain Data \_\_\_\_\_
  - Other: \_\_\_\_\_

\* Specify the information format, i.e., plan sheet, computer disk, computer printout, or other. The information marked is either contained on the plans or is available from the Engineer.

**TYPE OF PROJECT**

- Landscaping
- Signalization
- Safety Improvement
- Asphalt Overlay
- Concrete Overlay
- Minor Widening
- Major Reconstruction
- New Roadway Construction
- Bridge Replacement
- Bridge Widening
- New Bridge
- Other: \_\_\_\_\_

**SURVEY WORK TO BE PERFORMED BY OTHERS:** \_\_\_\_\_

**WORK PERFORMED BY THE CONTRACTOR'S SURVEYOR UNDER SECTION 625:**

- A complete passing Base Line report (completed within 6 months prior to the start of the project)
- An instrument calibration Certification (completed within 6 months prior to the start of the project)
- Establish and Maintain Project Centerline or Engineer Approved Offset Line(s)
- Verification and Maintenance of Horizontal and Vertical Control
- Verify or Determine existing grades and alignments
- Verify or Determine existing topography
- Clearing and Grubbing Limits (Section 201)
- Removal Limits (Section 202)
- Reset Items (Section 210)
- Excavation and Embankment (Section 203)

- Excavation**
- Unclassified
  - Stripping
  - Muck
  - Rock
  - Borrow
  - Other: \_\_\_\_\_
  - Potholing

- Embankment**
- Site Grading
  - Erosion Control (Perm)
  - Other: \_\_\_\_\_
  - As Staked Earthwork Quantities (See General Notes)

	Slope Staking (Y/N)	Grid (Y/N)	Grade (Y/N)	Special Interval
Excavation	-	-	-	-
	-	-	-	-
	-	-	-	-
	-	-	-	-
	-	-	-	-

	Slope Staking (Y/N)	Grid (Y/N)	Grade (Y/N)	Special Interval
Embankment	-	-	-	-
	-	-	-	-
	-	-	-	-
	-	-	-	-
	-	-	-	-

- Landscaping
  - Top Soil (Section 207)
  - Seeding (Section 212)
  - Mulching (Section 213)
  - Planting (Section 214)
  - Herbicide (Section 217)
  - Other: \_\_\_\_\_
- Erosion Control (Section 208)
  - Seeding (Temp)
  - Silt Fence
  - Erosion Bales
  - Erosion Logs
  - Riprap (Temp)
  - Other: \_\_\_\_\_
- Roadway Bases
  - Untreated Subgrade
  - Treated Subgrade
  - Aggregate Base Course (Section 304)
  - Reconditioning
  - PMBB - Plant Mix Bituminous Base
  - Other: \_\_\_\_\_

	Grid (Y/N)	Grade (Y/N)	Special Interval	Special Offset
Roadway Bases	-	-	-	-
	-	-	-	-
	-	-	-	-
	-	-	-	-
	-	-	-	-

- Pavements**
- HMA - Hot Mix Asphalt (Section 403)
  - Concrete (Section 412)
  - Heating & Scarifying Treatment
  - Prime Coat, Tack Coat & Rejuvenating Agent (Section 407)
  - Seal Coat or Chip Seal (Section 409)
  - Other: \_\_\_\_\_

	Grid (Y/N)	Special Interval	Special Offset
Pavements	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-

- Roadway Elements**
- Curb and Gutter (Section 609)
  - Drop inlets - alignment and grades (Section 604)
  - Retaining Walls
  - Guard Rail (Section 606)
  - Sidewalk (Section 608)
  - Overlay Stationing
  - Other: \_\_\_\_\_

	Tangent Interval	Curve Interval	Special Offset
Curb & Gutter	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-

- Riprap (Perm) (Section 506)
- Slope and Ditch Paving (Section 507)

- Minor Structures**
- Structure Excavation limits (Section 206)
  - Culverts (Section 603)
  - Culverts w/ Headwalls and Wingwalls (Section 601)
  - Concrete Box Culverts w/ Headwalls and Wingwalls
  - Pipes (Section 603)
    - Sanitary Sewer
    - Storm Sewer
    - Water
    - Irrigation
    - Miscellaneous
  - Manholes (Section 604)
  - Inlets (Section 604)
  - Permanent Water Quality BMP (Section 208)
  - Other: \_\_\_\_\_

	Left Interval	Center Interval	Right Interval
Stationing	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-

- Major Structures - Overhead Signs (Section 614), Concrete Box Culverts, Bridges - and all other structures assigned a structure number
  - Structure Excavation limits (Section 206)
  - Concrete Box Culverts (Section 603) w/ Headwalls and Wingwalls (Section 601)
  - Piling locations and cut off elevations (Section 502)
  - Caisson locations and elevations (Section 503)
  - Footing locations, alignment, and elevations
  - Abutment/Pier locations, alignment, and elevations
  - Wingwall skew angles/offsets
  - Structural concrete form locations
  - Substructure As-constructed survey required for Bridges (Subsection 601 .12) and Overhead signs (S-614-50)
  - Bridge expansion joint(s) alignment and grade (longitudinal and transverse)
  - Deck grades at Girder 10th or "n" th point locations and elevations
  - Slope and Ditch Paving (Section 507)
  - Other: \_\_\_\_\_

- Fencing (Section 607)
  - Temporary
  - Permanent
  - Sound Barrier
  - Other: \_\_\_\_\_

- Delineators (Section 612)
  - Temporary
  - Permanent

- Lighting (Section 613) and Traffic Control Devices (Permanent) (Section 614)
  - Signal pole locations and elevations
  - Light pole locations and elevations
  - Sign locations
  - Field verify sign post locations, elevations, and lengths before fabrication.
  - Other: \_\_\_\_\_

- Pavement Marking (Section 627)
  - Striping (Temp)
  - Striping (Perm)
  - Symbols
  - Other: \_\_\_\_\_
- Temporary Lighting and Construction Traffic Control Devices (Section 630)
  - Signal pole locations and elevations (Temp)
  - Light pole locations and elevations (Temp)
  - Sign Locations (Temp)
  - Other: \_\_\_\_\_
- All Easements (Temp Staking by P.L.S. Only)
- Right of Way (Temp Staking by P.L.S. Only)

**WORK PERFORMED BY THE CONTRACTOR'S SURVEYOR UNDER SECTION 629:**

- Monumentation (Section 629)
  - Control
  - Right of Way
  - Land corners, Aliquot corners
  - Easements
  - Reference the specified existing monuments: \*\* \_\_\_\_\_
  - Replace the specified existing monuments: \*\* \_\_\_\_\_
  - Locate monuments. It is estimated \_\_\_\_\_ hours are required.

NOTE: All 629 items shall include adequate research, calculations, and evaluations of evidence for monuments to be set.

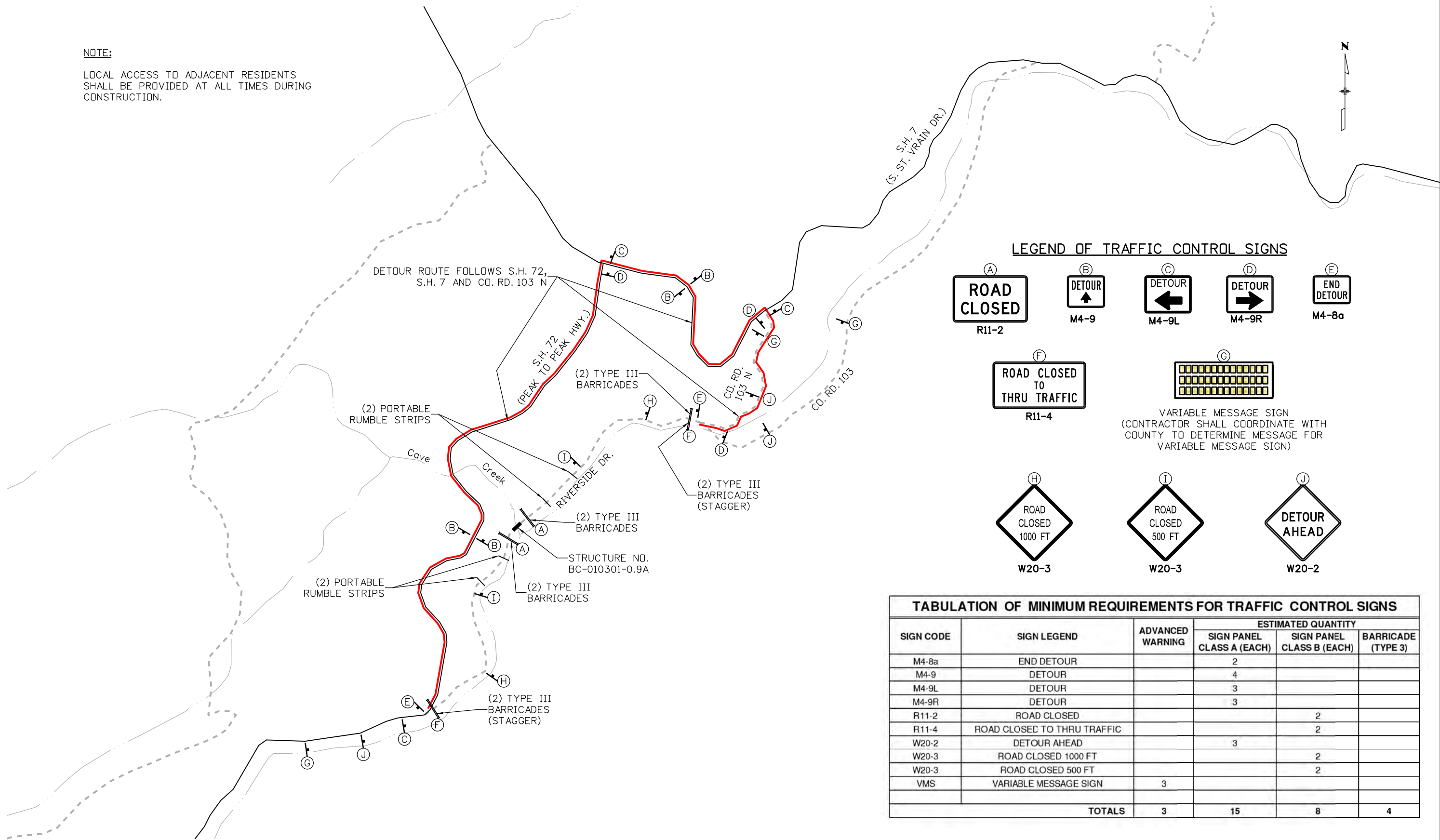
\*\* A Tabulation of Survey Monuments may be provided on the plans.

**GENERAL NOTES:**

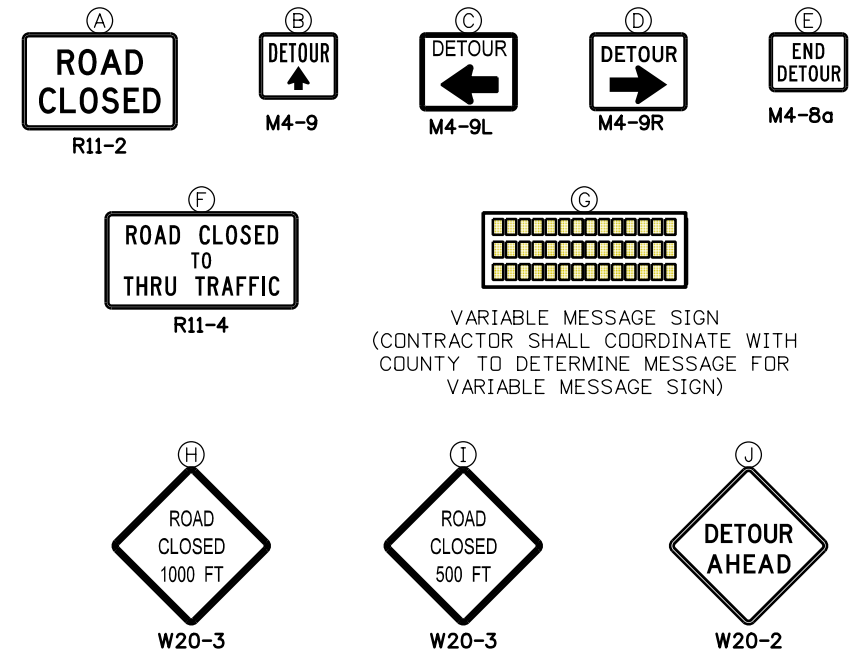
- Unless indicated otherwise on this Survey Tabulation Sheet, all survey work and staking intervals shall be done in accordance with the latest edition of the CDDT Survey Manual.
- Adequate information for establishing lines, grades, and locations for all work items have been specified on the plans. Any additional information required to stake the item or element shall be generated by the Contractor's surveyor.
- The Contractor's surveyor shall provide an estimate of the man-hours necessary to complete the work items indicated on this sheet. A copy of this sheet, with the estimated man-hours written on the blank line to the left of the specified items, shall be submitted with the Survey Schedule to the Engineer \_\_\_\_\_ days prior to the Presurvey Conference - Construction Survey.
- Stakes and Monuments which are damaged or destroyed by the progress of construction shall be replaced by the Contractor at no additional cost to the Department.
- The Contractor shall furnish an As Staked (or 3D Design Modeling Electronic Files) Earthwork Quantity report to the Engineer prior to completion of twenty percent (20%) of the planned earthwork in any phase as per the CDDT Survey Manual. A printed copy of the As Staked (or 3D Design Modeling Electronic Files) Earthwork data report and a computer disk with that information on it, in the specified format shall be submitted to the Engineer. The Contractor shall field verify original ground cross sections at a maximum 500 feet intervals.
- Prior to beginning work on any subsequent operation, such as placing base course or paving, the Contractor shall certify in writing to the Engineer that the final grade is within specified tolerance.
- The Contractor's surveyor shall perform all field surveying and calculations necessary to tie plan grades into field grades.
- The Contractor shall coordinate construction staking on the project with any utility work.
- Fieldbooks shall contain daily records of points set and or measurements observed. The information recorded shall contain: date, crew members' names, point no., description, staking information, and sketches. If the survey information is collected electronically, information recorded shall be provided to the Project Engineer in a hard copy format that is intuitive, clear and related to the supplemental information recorded in the field books. All linear surveys, such as slope stakes and blue tops, shall have the station and offset information related to the measured information. Non-linear surveys such as structures staking shall have sketches relating electronic information, such as point numbers, to the sketch.
- The Contractor's surveyor shall submit the following fieldbooks to the Engineer:
  - Horizontal Control (Primary & Secondary)
  - Vertical Control (i.e. Benchmarks)
  - Property Pin Ties
  - Horizontal Alignment
  - Grading
  - Slope Staking
  - Minor Structures
  - Major Structures
  - One fieldbook for each work category shown on this sheet
  - Other Fieldbook(s): \_\_\_\_\_
- The Contractor's surveyor shall submit the following (prior to surveying on the project) to the Engineer:
  - All required Instrument Calibrations

**NOTE:**

LOCAL ACCESS TO ADJACENT RESIDENTS SHALL BE PROVIDED AT ALL TIMES DURING CONSTRUCTION.



**LEGEND OF TRAFFIC CONTROL SIGNS**



SIGN CODE	SIGN LEGEND	ADVANCED WARNING	ESTIMATED QUANTITY		
			SIGN PANEL CLASS A (EACH)	SIGN PANEL CLASS B (EACH)	BARRICADE (TYPE 3)
M4-8a	END DETOUR		2		
M4-9	DETOUR		4		
M4-9L	DETOUR		3		
M4-9R	DETOUR		3		
R11-2	ROAD CLOSED			2	
R11-4	ROAD CLOSED TO THRU TRAFFIC			2	
W20-2	DETOUR AHEAD		3		
W20-3	ROAD CLOSED 1000 FT			2	
W20-3	ROAD CLOSED 500 FT			2	
VMS	VARIABLE MESSAGE SIGN	3			
<b>TOTALS</b>		<b>3</b>	<b>15</b>	<b>8</b>	<b>4</b>

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<b>FINAL</b>	CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES	NO.	DATE	REVISION DESCRIPTION:	<b>BOULDER COUNTY PUBLIC WORKS ENGINEERING DIVISION</b>	RIVERSIDE DR. STRUCTURE REPLACEMENT	
		DESIGNED: SEK	CAD/C3D: DWS	CHECKED: SEK		DATE: 9-27-2022	<b>DETOUR PLAN</b>
						PROJECT NO: <b>BC-103-009</b>	SHEET NO: <b>15</b>



**SWMP TEMPLATE (PLAN SHEETS) FOR PROJECTS WITH LESS THAN 1 ACRE OF DISTURBANCE (2/25/2022)**

**1. SITE DESCRIPTION**

The Contractor shall comply with all CDOT contractual requirements. The SWMP Administrator for Construction shall update to reflect current project site conditions.

**A. PROJECT SITE LOCATION:**

Location or address of construction office: TBD  
Project site is located approximately 0.9 miles southwest of the intersection of SH 7 and SH 72 within Boulder County, CO. Structure No. BC-010301-0.9 located on Riverside Drive crossing over Cave Creek, and adjacent to Middle Saint Vrain Creek.

**B. PROJECT SITE DESCRIPTION:**

This project includes replacement of an existing cast-in-place concrete slab on stone masonry abutments and wingwalls with a 14'Wx7'H concrete box culvert with cast-in-place concrete headwalls, wingwalls, and toewalls. This project also includes clearing and grubbing, removals (asphalt, structures, signs), excavation and backfill, seeding, mulching, erosion control, dewatering, asphalt patching, riprap, guardrail, traffic control with a road closure and detour, construction surveying, striping, and mobilization.

**C. PROPOSED SEQUENCING FOR MAJOR CONSTRUCTION ACTIVITIES:**

1. Traffic Control (road closure and detour)
2. Erosion Control Measures
3. Clearing and Grubbing
4. Initial erosion control
5. Removals (asphalt, structures, signs)
6. Excavation and Backfill
7. Dewatering
8. Bridge Replacement
9. Asphalt Patching
10. Final Striping
11. Final Stabilization

**D. ACRES OF DISTURBANCE:**

1. Total area of construction site (LOC): 0.60 acres
2. Total area of proposed disturbance (LDA): 0.49 acres
3. Total area of seeding: 0.09 acres

**E. EXISTING SOIL DATA:**

Sandy Loam; Wind Erodibility Group Rating 6 and Wind Erodibility Index of 48 tons per acre per year.  
Data Source(s): NRCS Web Soil Survey

**F. EXISTING VEGETATION, INCLUDING PERCENT OF VEGETATIVE COVER:**

During design, the SWMP Administrator for Design in consultation with the Engineer will determine if the SWMP Administrator for Design or the SWMP Administrator for Construction will conduct the Vegetation Transects. If the site is disturbed, an Adequate Reference Site(s) may be utilized, refer to the permit. Vegetation Transect instruction is located on CDOT Landscape Architecture website.  
<https://www.codot.gov/programs/environmental/landscape-architecture/swmp/vegetative-transect-procedure.pdf>

Pre-Construction Date of survey: \_\_\_\_\_ Percent Existing Vegetative Cover: \_\_\_\_\_

Description of existing vegetation:

Method for determining percent vegetative cover:

Include a map or table showing transect locations, photos documenting pre-Construction vegetative cover, and methodology used to determine existing vegetative cover to SWMP tab 17:  
<https://www.codot.gov/programs/environmental/landscape-architecture>

Post-Construction Date of survey: \_\_\_\_\_ Percent Vegetative Cover: \_\_\_\_\_

Description of vegetation:

The method used to determine pre-construction percent cover shall be used to determine post construction percent cover.

Include map or table showing transect locations, photos documenting post-Construction vegetative cover, and methodology used to determine existing vegetative cover to SWMP tab 17:

<https://www.codot.gov/programs/environmental/landscape-architecture>

**2. STORMWATER MANAGEMENT CONTROLS FOR FIRST CONSTRUCTION ACTIVITIES**

THE CONTRACTOR SHALL PERFORM THE FOLLOWING:

**A. POTENTIAL POLLUTANT SOURCES**

Refer to Potential Pollutant Sources in SWMP Section 4A. Evaluate, identify and describe all potential sources of pollutants at the site in accordance with subsection 107.25 and place any Control Measures required to contain potential pollutants.

**B. OFFSITE DRAINAGE (RUN ON WATER):**

Place Control Measures to address run-on water in accordance with subsection 208.03.

**C. CONSTRUCTION DEWATERING:**

Obtain a CDPS Dewatering Permit from CDPHE if conditions of their Low Risk Guidance for Discharges of Uncontaminated Groundwater to Land are not met; see subsections 107.02 and 107.25.

Refer to CDPHE Low Risk Discharge Guidance Document of Uncontaminated Groundwater to Land.

<https://www.colorado.gov/pacific/sites/default/files/WQ%20LOW%20RISK%20GW.pdf>

**D. VEHICLE TRACKING CONTROL:**

Control Measures shall be implemented in accordance with subsection 208.04.

**E. PERIMETER CONTROL:**

Perimeter control shall be established as the first item on the SWMP to prevent the potential for pollutants leaving the construction site boundaries, entering the stormwater drainage system, or discharging to state waters.

Perimeter control may consist of berms, silt fence, erosion logs, existing landforms, or other Control Measures as approved.

**3. QUALIFIED STORMWATER MANAGERS:**

**A. SWMP ADMINISTRATOR FOR DESIGN:**

CDOT Certified Individual responsible for developing SWMP Plan Sheets and SWMP Site Maps during the design phase.

Name/Title	Contact Information	Certification #
Katie Croell Engineer	303-586-5814 <a href="mailto:kcroell@sehinc.com">kcroell@sehinc.com</a>	A34F8036



**B. SWMP ADMINISTRATOR FOR CONSTRUCTION:**

(As defined in Section 208) The Contractor shall designate a SWMP Administrator for Construction. The SWMP Administrator for Construction shall become the operator for the SWMP and assume responsibility for all design changes to the SWMP implementation and maintenance in accordance to 208.03, the SWMP shall remain the property of CDOT. The SWMP Administrator for Construction shall be responsible for implementing, maintaining, and revising SWMP, including the title and contact information. The activities and responsibilities of the SWMP Administrator for Construction shall address all aspects of the project's SWMP. (Update the information below for each new SWMP Administrator for Construction) (Copy of TECS Certification must also be included in the SWMP.)

Name/Title	Contact Information (phone & email)	TECS Certification #	Start Date	Engineer Approval

**C. PERMANENT STABILIZATION SUBJECT MATTER EXPERT:** This qualified individual will be either a Regional Environmental Staff member, or an Independent Contractor Controller (Independent Assurance Program). This expert is a project team leader responsible for ensuring project adherence to

Template Revised: 2.25.2022

<b>FINAL</b>	 <p>CALL UTILITY NOTIFICATION CENTER OF COLORADO CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES</p>	REVISIONS: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>NO.</th> <th>DATE</th> <th>REVISION DESCRIPTION:</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>	NO.	DATE	REVISION DESCRIPTION:											<b>BOULDER COUNTY PUBLIC WORKS ENGINEERING DIVISION</b>	RIVERSIDE DR. STRUCTURE REPLACEMENT
			NO.	DATE	REVISION DESCRIPTION:												
DESIGNED: SEK CAD/C3D: DWS CHECKED: SEK DATE: 7/17/2023	<b>STORMWATER MANAGEMENT PLAN</b>	PROJECT NO: <b>BC-103-009</b> SHEET NO: <b>16</b>															

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requirements of the 207 and 212 Project Special Provisions as follows, and will be available for questions regarding permanent stabilization requirements.

1. Review the Topsoil Management Plan and the Permanent Stabilization Site Maps.
2. Attend the Environmental Pre-construction Conference.
3. Coordinate the Site Pre-vegetation Conference.
4. Review and recommend approval of products.
5. Review and recommend approval of the Quantities Verification Prerequisite.
6. Attend the Partial Landscape Completion Walkthrough.
7. Attend the Final Landscape Completion Walkthrough.

Name/Title	Contact Information

#### 4. DURING CONSTRUCTION

The SWMP should be considered a "living document" that is continuously reviewed and modified. During construction, the following items shall be added, updated, or amended as needed by the Contractor in accordance with Section 208

- A. **MATERIALS HANDLING AND SPILL PREVENTION:**  
prior to construction commencing the Contractor shall submit a Spill Prevention, Control and Countermeasure Plan, see subsection 208.06. Materials handling shall be in accordance with subsection 208.06.
- B. **OTHER CDPS PERMITS:**  
List applicable CDPS permits associated with the permitted site and activities.
- C. **STOCKPILE MANAGEMENT:**  
shall be done in accordance with subsections 107.25 and 208.07
- D. **CONCRETE WASHOUT:**  
Concrete wash out water or waste from field laboratories and paving equipment shall be contained in accordance with subsection 208.05.
- E. **SAW CUTTING:**  
shall be done in accordance with subsections 107.25, 208.04, 208.05
- F. **STREET SWEEPING:**  
shall be done in accordance with subsection 208.04

#### 5. CONTROL MEASURE MAINTENANCE

Maintenance shall be in accordance with subsection 208.04 (f).

#### 6. INTERIM AND PERMANENT STABILIZATION

The Contractor shall comply with all interim stabilization and permanent stabilization requirements in accordance with subsection 208.04(e).

##### A. SEEDING PLAN

The following seed mix(es) and rates are for drill seeding method as shown on the Permanent Stabilization Site Maps shall be used:

COMMON NAME	BOTANICAL NAME	LBS. PLS PER ACRE
Blue Grama	Bouteloua gracilis	0.84
Canada Wildrye	Elymus canadensis	3.03
Thickspike Wheatgrass	Elymus lanceolatus	5.58
Slender Wheatgrass	Elymus trachycaulus	5.48
Junegrass	Koeleria macrantha	0.15
Sandberg's Bluegrass	Poa secunda	0.38
<b>TOTAL</b>		<b>15.46</b>

##### B. SEEDING APPLICATION:

The following seeding methods shall be used for all areas which are not surfaced and as shown on the Permanent Stabilization Site Maps. Soil compaction shall be minimized for areas where permanent stabilization will be achieved through vegetative cover.

Pay Item	Seeding Method (subsection 212.05)	Acre
212-00706	Seeding (Native) Drill	0.09
<b>Total</b>		<b>0.09</b>

The Contractor shall provide the location of where seed is stored and access to stored seed locations to the Engineer. Seed stored by the Contractor for longer than 30 days will be rejected.

##### C. MULCHING APPLICATION:

Apply a minimum of 2 tons/ac of certified weed free hay or 2 1/2 tons/ac of certified weed free straw per acre and in accordance with Section 213, and mechanically crimp it into the soil in combination with an organic mulch tackifier.

Prior to winter shutdown or the summer seeding window closure: Uncompleted slopes shall be mulched with 2 tons of mulching (weed free) per acre, mechanically crimped into the topsoil in combination with an organic mulch tackifier in accordance with Sections 208 and 213.

##### D. SPECIAL REQUIREMENTS:

Soil amendments, seedbed preparation, and permanent stabilization mulching shall be accomplished within four working days of placing the topsoil on the de-compacted civil subgrades. If placed topsoil is not mulched with permanent stabilization mulch within four working days, the Contractor shall complete interim stabilization methods in accordance with subsection 208.04(e) at no additional cost to the Department.

Permanent stabilization mulching shall be accomplished within 24 hours of hydraulic application of native seed.

The Contractor shall submit a proposed Permanent Stabilization Phasing Plan to the Engineer for approval showing how the SWMP Permanent Stabilization Plans will be implemented to minimize damage to seeded areas.

##### E. SOIL AMENDMENT REQUIREMENTS:

Minimum amendment material requirements for all disturbances to receive seeding (native).

0.09 Total Acres of Seeding (Native) Drill with Topsoil Generated From Topsoil (Onsite)

Seeding (Native) Drill Pay Item 212-00706	Pay Item	Description	Amount/Acre	Units	Total For This Method
	212-00700	Organic Fertilizer Low N	300	Pounds	27
	212-00701	Compost (Mechanically Applied)	65	CY	6
	212-00703	Humate	200	Pounds	18
	212-00704	Mycorrhizae	8	Pounds	1
	212-00705	Elemental Sulfur	N/A	Pounds	N/A

##### F. SOIL RETENTION COVERING:

On slopes and ditches requiring a blanket or turf reinforcement mat (trm), the blanket/trm shall be placed in lieu of mulch and mulch tackifier and placed after seeding (native). See SWMP Site Map for blanket/trm locations.



##### G. PERMANENT STABILIZATION APPLICATION UNDER STRUCTURES:

Under structures shade patterns should be considered and the use of Median Cover Material (Stone) or other stabilized options with an approved Project Special Provision should be used. See SWMP Site Map for locations.

##### H. RESEEDING OPERATIONS/CORRECTIVE STABILIZATION:

Prior to partial acceptance.

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<b>FINAL</b>	 CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES	CALL UTILITY NOTIFICATION CENTER OF COLORADO	NO.	DATE	REVISION DESCRIPTION:		<b>BOULDER COUNTY PUBLIC WORKS ENGINEERING DIVISION</b>	RIVERSIDE DR. STRUCTURE REPLACEMENT	
		DESIGNED: SEK	CAD/C3D: DWS	CHECKED: SEK	DATE: 1/18/2023			<b>STORMWATER MANAGEMENT PLAN</b>	
		PROJECT NO: <b>BC-103-009</b>		SHEET NO: <b>17</b>					

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All seeded areas shall be reviewed by the SWMP Administrator for Construction and or Engineer for bare soils caused by surface or wind erosion. Bare areas caused by surface or gully erosion, blown away mulch, etc. shall be re-graded, seeded, and have the designated mulching applied as necessary, at no additional cost to the project.

The Contractor shall maintain seeding/mulch/tackifier/blanket/TRM, mow to control weeds or apply herbicide to control weeds in the seeded areas until Partial Acceptance of the stormwater construction work.

**7. PRIOR TO PROJECT FINAL ACCEPTANCE**

1. When directed by the Engineer, removal and disposal of temporary control measures shall be included in the cost of work.
2. At the end of the project, all ditch checks shall consist of either temporary erosion logs (or equivalent) or permanent riprap.
3. All storm drains shall be cleaned prior to the Final Acceptance of the project. If required, include work in 202-04002 Clean Culvert.
4. Refer to Specification 208.10 for Items to be completed prior to requesting partial acceptance of water quality work.

**8. NARRATIVES:**



**Control Measure Matrixes During Construction:**

1. Control measure narratives have been included for the CDOT Standard Specifications and Standard Plan M-208 and M-216 along with any non-standard control measures approved during the design process. If a Non-Standard Control Measure not included in the SWMP is proposed and approved by the Engineer the SWMP Administrator for Construction shall do the following: Place an "X" in the column for non-standard and complete a Non-Standard Control Measure Specification and Narrative covering the what, when, where and why the control measure is being used shall be add to the SWMP. The appropriate "X" shall also be added to the implementation phase(s).
2. The SWMP Administrator for Construction shall place an "X" in the column In Use On Site when the control measure has been installed.
3. A "B" in the Initial Activities Column indicates that the control measure shall be installed **before** construction activity starts. Locations and quantities will be discussed during the Environmental Pre-Construction Conference with the Regional Water Pollution Control Manager.

**STRUCTURAL Control Measures** that may be potentially used on the project for erosion and sediment control; practices may include, but are not limited to:



APPLICATION, CONTROL MEASURE	NARRATIVE	M-208 STANDARD or "X" for NON-STANDARD	IN USE ON SITE	CONTROL MEASURE IMPLEMENTATION PHASE		
				INITIAL ACTIVITIES	INTERIM ACTIVITIES	PERMANENT STABILIZATION
PROTECTION OF EXISTING WETLANDS Fence (plastic) and erosion logs	Fence (plastic) shall be placed in combination with erosion logs to prevent encroachment of construction traffic and sediment into state waters prior to start of construction disturbances. Fence (plastic) shall be placed adjacent to the wetlands; erosion logs shall be placed between the plastic fence and disturbance area. Logs shall be placed to direct flows away from or filter water running into wetlands from disturbance areas.			X	X	
PROTECTION OF EXISTING TREES/LANDSCAPING Fence (plastic)	Fence (plastic) shall be used in areas indicated in the plans to prevent encroachment of construction traffic and sediment for the protection of mature trees and/or existing landscaping prior to start of construction disturbances.			X	X	
CHECK DAM/DITCH CHECK Erosion log, silt berm, silt dike, rock check dam	Placed in ditches immediately upon completion of ditch grading to reduce velocity of runoff in ditch. For existing ditches, place prior to start of construction disturbances.	M-208		X	X	
Storm Drain Inlet Protection In Paved Roadways (Type 1, 2 and 3 as shown on M-208-1, sheet 5 of 11)	Manufactured storm drain inlet protection placed prior to construction disturbances as detailed in M-208-1, to protect existing inlets or immediately upon completion of new inlets to prevent sediment from entering the inlet throughout construction.	M-208				
Storm Drain Inlet Protection In Native Seed Areas (M-604 Standard Inlets Type C and D)	Erosion logs or aggregate bags placed around inlet grate to prevent sediment from entering inlet. Place prior to construction disturbances to protect existing inlets or immediately upon completion of new inlets.	M-208				
CULVERT INLET/OUTLET PROTECTION Erosion logs, aggregate bags	Placed at mouth of culvert inlets and over top of culvert at inlet and outlet where disturbance may be occurring adjacent to pipe to prevent sediment laden water from entering pipe or drainage. Place prior to start of construction disturbances.	M-208				
TYPE C, TYPE D AND TYPE 13 PROTECTION Erosion logs, aggregate bags, erosion bales	Placed around inlet grate or slope and ditch paving to prevent sediment from entering inlet. Place prior to start of construction disturbances.	M-208				
STOCKPILE PROTECTION Temporary berm, erosion logs, aggregate bags*	Placed within specified distance, in accordance with subsection 208.06, from toe to contain sediment around stockpile. *Aggregate bags are easily moved and replaced for access during the work day. Place prior to start of stockpile, increase control as stockpile increases size.	M-208			X	
TOE OF FILL PROTECTION Erosion logs, temporary berm, silt fence, topsoil windrow*	Place prior to slope/embankment work to capture sediment and protect and delineate undisturbed areas. *Can be used to stockpile topsoil for salvage.	M-208		X	X	
PERIMETER CONTROL Erosion logs, silt fence, temporary berm, topsoil windrow*	Placed prior to construction commencing to address potential run-on water from off site, and to divert around disturbed area. *Can be used to stockpile topsoil for salvage.	M-208		X	X	

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APPLICATION, CONTROL MEASURE	NARRATIVE	M-208 STANDARD or "X" for NON-STANDARD	IN USE ON SITE	CONTROL MEASURE IMPLEMENTATION PHASE		
				INITIAL ACTIVITIES	INTERIM ACTIVITIES	PERMANENT STABILIZATION
SLOPE CONTROL Silt fence, erosion logs	Placed on the contour of a slope to contain and slow down construction runoff. Place prior to start of construction disturbances.	M-208		X	X	
TEMPORARY SEDIMENT TRAP	Used to capture sediment laden runoff from disturbed areas < 5 acres during construction. Place prior to start of construction disturbances. Outlets that withdraw water from or near the surface may be installed when discharging from basins and impoundments.	M-208				
TEMPORARY SLOPE DRAIN	Placed as a conduit or chute to drain runoff down slope and to prevent erosion of slope.	M-208			X	
OUTLET PROTECTION Riprap, or approved other	Material placed as energy dissipater to prevent erosion at outlet structure.	M-601-12			X	X
CONCRETE WASHOUT In-ground or fabricated	Construction control, used for waste management of concrete and concrete equipment cleaning. Place prior to start of concrete activities.	M-208		X	X	
VEHICLE TRACKING PAD	Source control, placed to prevent tracking of sediment from disturbed area to offsite surface. Place prior to start of construction disturbances.	M-208			X	X
Engineered SEDIMENT BASIN	Constructed early in project, prior to storm sewer/ditches and in accordance with 208.05(p) to capture storm flow. Outlet structure and/or outfall shall be modified for temporary sediment control using an approved non-standard detail. Outlets that withdraw water from or near the surface shall be installed when discharging from basins and impoundments, unless infeasible					
DEWATERING (Contractor is responsible for obtaining a permit from Colorado Department of Health and Environment.)	Shall be done in such a manner to prevent potential pollutants from entering state waters.			X	X	
TEMPORARY STREAM CROSSING	Constructed over stream or drainage to prevent discharge of pollutants from construction equipment into water.			X	X	
CLEAN WATER DIVERSION	Placed to divert clean surface or ground water around disturbance area to prevent it from mixing with construction runoff.			X	X	
OTHER						

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**NON-STRUCTURAL Control Measures** that may be potentially used on the project for erosion and sediment control; practices may include, but are not limited to: Erosion control devices are used to limit the amount of soil loss on site. Sediment control devices are designed to capture sediment on the project site.

APPLICATION, CONTROL MEASURE	NARRATIVE	M-STANDARD or "For NON-STANDARD	IN USE ON SITE	CONTROL MEASURE IMPLEMENTATION PHASE		
				INITIAL ACTIVITY	INTERIM ACTIVITIES	PERMANENT STABILIZATION
VEGETATIVE BUFFER STRIP	Finishing component for filtering sediment-laden runoff from disturbance area. Area within CDOT ROW or temporary easement to be identified on SWMP prior to construction starting.					
GRADING APPLICATIONS (LANDFORM)	Existing or created landforms may be used as a control measure if they prevent sediment from entering or leaving the disturbance area. If a landform directs flow of water to a concentrated outfall point, the outfall point shall be protected to prevent erosion. Area to be identified on SWMP prior to construction starting.	M-208		X	X	
TOPSOIL MANAGEMENT STOCKPILE/SALVAGE Stockpile	Prior to any site disturbance work commencing, existing topsoil shall be scraped to a depth four inches or as specified, and placed in stockpiles or windrows. Upon completion of final grading, topsoil shall be evenly distributed over embankment to a depth of four inches or as specified.	M-208		X	X	
SURFACE ROUGHENING / GRADING TECHNIQUES	Temporary stabilization of disturbance and to minimize wind and erosion.				X	
SEEDING (TEMPORARY)	Temporary stabilization used for over wintering of disturbance or used to control erosion for areas scheduled for future construction.					
BONDED FIBER MATRIX or MULCHING (HYDRAULIC)	Not to be used in areas of concentrated flows, i.e. ditch lines. To be for either Interim or Permanent Stabilization placed as a surface cover for erosion control. May be used as surface cover when work is temporarily halted and as approved by the Engineer for stockpiles.					
Straw or Hay MULCH/MULCH TACKIFIER	Interim or Permanent Stabilization placed as a surface cover for erosion control and or seeding establishment. To be installed as Interim Stabilization as a surface cover when work is temporarily halted and as approved by the Engineer				X	X
SPRAY-ON MULCH BLANKET (Not to be used in areas of concentrated flows, i.e. ditch lines.)	Interim or Permanent Stabilization placed as a surface cover for erosion control and or seeding establishment. To be installed as temporary surface cover when work is temporarily halted and as approved by the Engineer					
SEEDING PERMANENT (NATIVE)	Permanent Stabilization of disturbance and to reduce runoff and control erosion on disturbed areas.					X
SOIL RETENTION BLANKET (SRB)	Permanent Stabilization of disturbance and to reduce runoff and control erosion on disturbed areas.	M-216			X	X
TURF REINFORCEMENT MAT (TRM)	Permanent Stabilization of disturbance and to reduce runoff and control erosion on disturbed areas. Placed in channels or on slopes for erosion control, channel liner and seeding establishment.	M-216				
Sweeping	Source control, used to remove sediment tracked onto paved surfaces and to prevent sediment from entering drainage system. Sweep daily and at the end of the construction shift as needed. Kick brooms shall not be permitted.				X	X
OTHER						

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**9. TABULATION OF STORMWATER QUANTITIES**

- Control Measure sediment removal and disposal shall be paid for as: 208 Removal and Disposal of Sediment (Equipment) and 208 Removal and Disposal of Sediment (Labor). All other control measure maintenance shall be included in the cost of the control measure.
- It is estimated that 80 hours of blading (140-250 horsepower), dozing (130-250 horsepower) and/or combination loader (80-125 horsepower) may be required for miscellaneous erosion control work as directed by the Engineer. Work shall be paid for as: Blading, 203 Dozing and/or 203 Combination Loader]

Pay Item	Description	Pay Unit	Initial Const.	Interim Const.	Permanent Stabilization	*Total Quantity
203-01500	Blading	Hour	5	10	5	20
207-00700	Topsoil (Onsite)	CY			45	45
207-00703	Topsoil (Wetland)	CY			12	12
207-00704	Subgrade Soil Preparation	SY			418	418
208-00002	Erosion Log Type 1 (Biodegradable) (12 inch)	LF	80	20		100
208-00020	Silt Fence	LF	220	205		425
208-00035	Aggregate Bag	LF	30	20		50
208-00041	Rock Check Dam	Each		1		1
208-00046	Pre-fabricated Concrete Washout Structure (Type 1)	Each		1		1
208-00070	Vehicle Tracking Pad	Each	2			2
208-00207	Erosion Control Management	Day	5	10	5	20
208-00301	Temporary Diversion	LS		1		1
211-0001	Dewatering	LS		1		1
212-00700	Organic Fertilizer	Pounds			27	27
212-00701	Compost (Mechanically Applied)-	CY			6	6
212-00703	Humate	Pounds			18	18
212-00704	Mycorrhizae	Pounds			1	1
212-00708	Seeding (Native) Broadcast	Acre			0.1	0.1
213-00002	Mulching (Weed Free Hay)	Acre			0.1	0.1
213-00061	Mulch Tackifier	LB			18	18
216-00222	Soil Retention Blanket (Coconut) (Biodegradable Class 2)	SY		175	50	225
607-11525	Fence (Plastic)	LF	760			760
700-70380	F/A Erosion Control	FA	0.33	0.33	0.33	1

\*It is anticipated that additional control measures and control measure quantities not shown on the SWMP Site Maps shall be required on the project for unforeseen conditions and replacement of items that are beyond their useful service life, see subsections 208.03 and 208.04. **Quantities for all control measures shown above are estimated, and have been increased for unforeseen conditions and normal control measure life expectancy.** Quantities shall be adjusted according to the conditions encountered in the field as directed and approved by the Engineer. Payment shall be for the actual work completed and material used.

\*\*Pay Item 208-00071 is included for anticipated maintenance of vehicle tracking pads based on the service life of the control measure in the field. The use of the material shall be directed and approved by the Engineer.

\*\*\* Using Erosion Control Management Pay Item on the project must be approved by the Regional Environmental Staff and Engineer. See 208.11 for method of measurement for the day pay unit.

\*\*\*\* F/A refers to CDOT's Force Account Pay Items.

**10. BIOLOGICAL IMPACTS and DEWATERING**

**A. ENVIRONMENTAL IMPACTS:**

Wetland Impacts: YES. Temporary and permanent wetland impacts must follow appropriate USACE Nationwide Permit requirements.

Stream Impacts: YES

Threatened and Endangered Species: No species are anticipated to be impacted by the project.

**B. DEWATERING:**

(Not covered under the CDPHE guidance document Low Risk Discharge Guidance Discharges of Uncontaminated Groundwater to Land):

<https://www.colorado.gov/pacific/sites/default/files/WQ%20LOW%20RISK%20GW.pdf>



Dewatering: Refer to other environmental permits in accordance with subsection 107.02 and the permits contained in Tab 16 of the SWMP.

If groundwater does not meet water quality standards for receiving water a separate CDPS Dewatering Permit shall be obtained by the Contractor from CDPHE in accordance with subsections 107.02 and 107.25.

**11. NOTES**


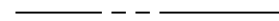
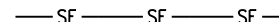



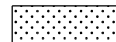
- EMC (or SWMP Administrator for Construction or Erosion Control Inspector) is included in the cost of the work.
- Final locations of water diversion structures must be determined by the Contractor and submitted for acceptance by the EMC.
- See Bridge Hydraulic information plan sheet for Rip Rap details.

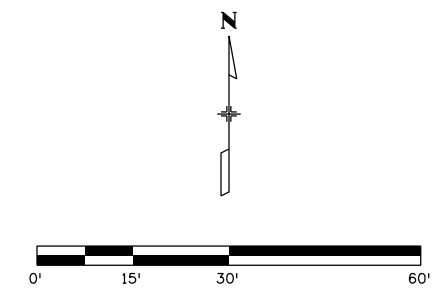
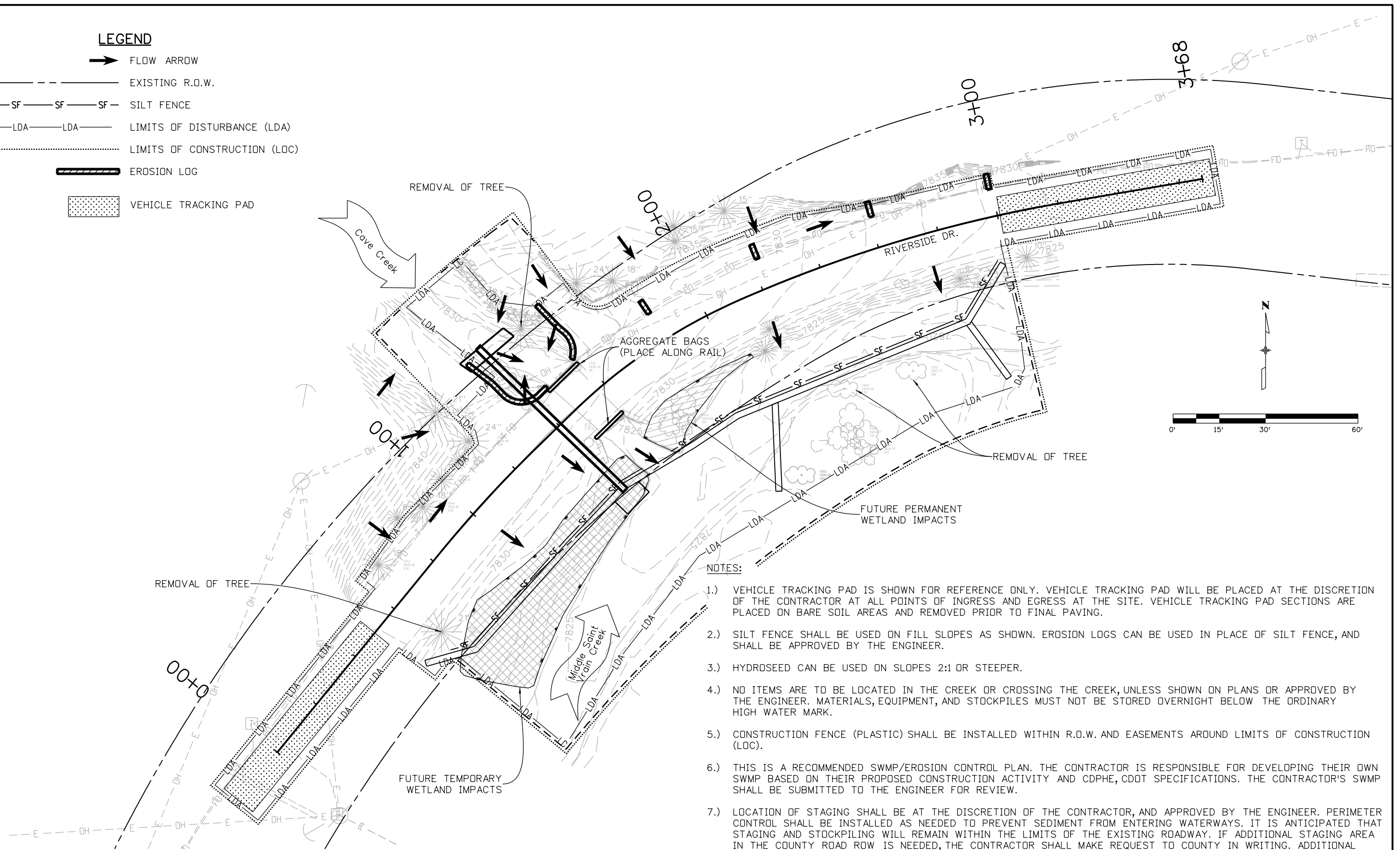
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**LEGEND**


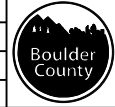
-  FLOW ARROW
-  EXISTING R.O.W.
-  SILT FENCE
-  LIMITS OF DISTURBANCE (LDA)
-  LIMITS OF CONSTRUCTION (LOC)
-  EROSION LOG
-  VEHICLE TRACKING PAD



**NOTES:**

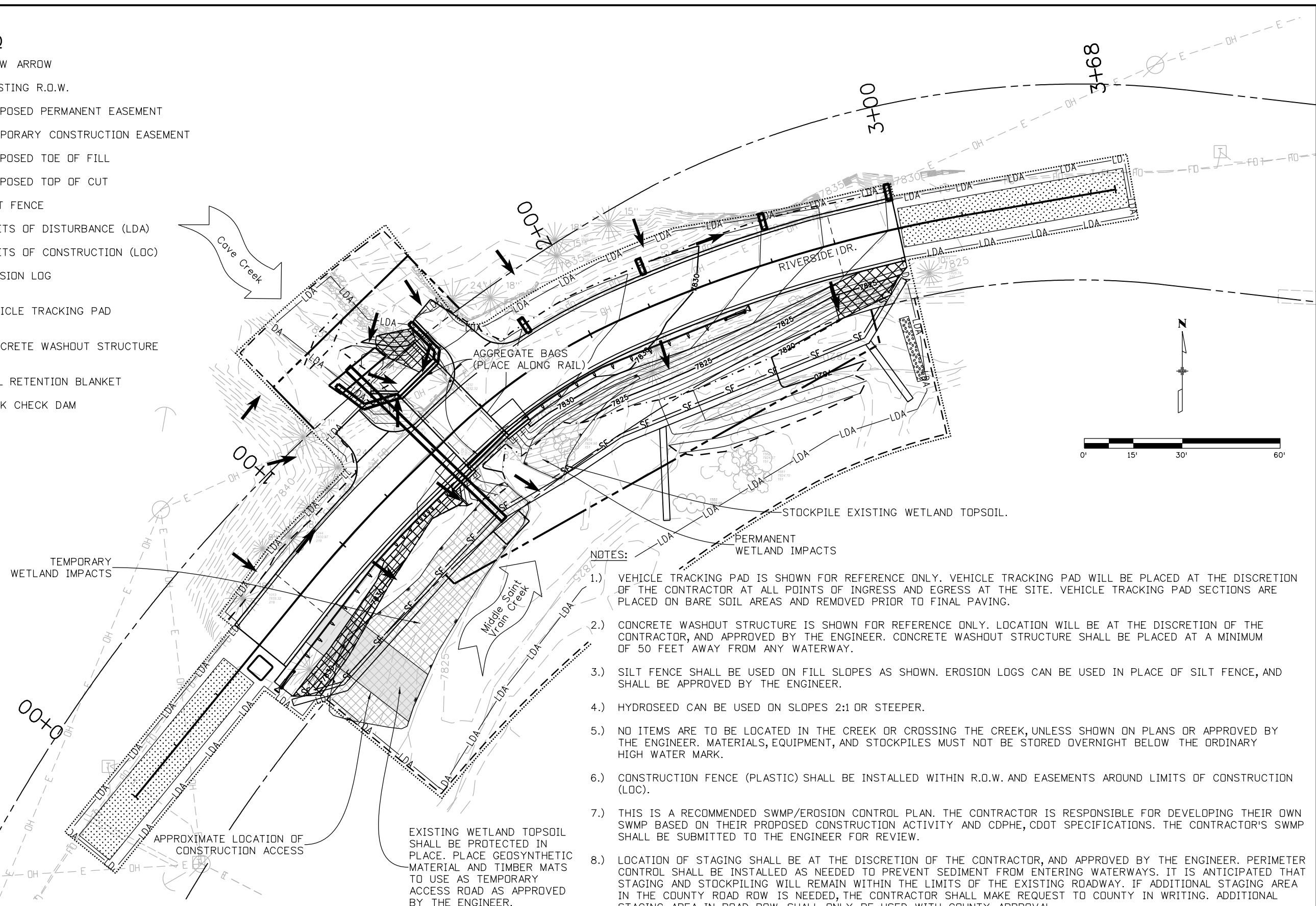
- 1.) VEHICLE TRACKING PAD IS SHOWN FOR REFERENCE ONLY. VEHICLE TRACKING PAD WILL BE PLACED AT THE DISCRETION OF THE CONTRACTOR AT ALL POINTS OF INGRESS AND EGRESS AT THE SITE. VEHICLE TRACKING PAD SECTIONS ARE PLACED ON BARE SOIL AREAS AND REMOVED PRIOR TO FINAL PAVING.
- 2.) SILT FENCE SHALL BE USED ON FILL SLOPES AS SHOWN. EROSION LOGS CAN BE USED IN PLACE OF SILT FENCE, AND SHALL BE APPROVED BY THE ENGINEER.
- 3.) HYDROSEED CAN BE USED ON SLOPES 2:1 OR STEEPER.
- 4.) NO ITEMS ARE TO BE LOCATED IN THE CREEK OR CROSSING THE CREEK, UNLESS SHOWN ON PLANS OR APPROVED BY THE ENGINEER. MATERIALS, EQUIPMENT, AND STOCKPILES MUST NOT BE STORED OVERNIGHT BELOW THE ORDINARY HIGH WATER MARK.
- 5.) CONSTRUCTION FENCE (PLASTIC) SHALL BE INSTALLED WITHIN R.O.W. AND EASEMENTS AROUND LIMITS OF CONSTRUCTION (LOC).
- 6.) THIS IS A RECOMMENDED SWMP/EROSION CONTROL PLAN. THE CONTRACTOR IS RESPONSIBLE FOR DEVELOPING THEIR OWN SWMP BASED ON THEIR PROPOSED CONSTRUCTION ACTIVITY AND CDPE, CDOT SPECIFICATIONS. THE CONTRACTOR'S SWMP SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW.
- 7.) LOCATION OF STAGING SHALL BE AT THE DISCRETION OF THE CONTRACTOR, AND APPROVED BY THE ENGINEER. PERIMETER CONTROL SHALL BE INSTALLED AS NEEDED TO PREVENT SEDIMENT FROM ENTERING WATERWAYS. IT IS ANTICIPATED THAT STAGING AND STOCKPILING WILL REMAIN WITHIN THE LIMITS OF THE EXISTING ROADWAY. IF ADDITIONAL STAGING AREA IN THE COUNTY ROAD ROW IS NEEDED, THE CONTRACTOR SHALL MAKE REQUEST TO COUNTY IN WRITING. ADDITIONAL STAGING AREA IN ROAD ROW SHALL ONLY BE USED WITH COUNTY APPROVAL.

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**LEGEND**

- FLOW ARROW
- EXISTING R.O.W.
- PROPOSED PERMANENT EASEMENT
- TEMPORARY CONSTRUCTION EASEMENT
- PROPOSED TOE OF FILL
- PROPOSED TOP OF CUT
- SF — SF — SF — SILT FENCE
- LDA — LDA — LDA — LIMITS OF DISTURBANCE (LDA)
- LIMITS OF CONSTRUCTION (LOC)
- ▨ EROSION LOG
- ▨ VEHICLE TRACKING PAD
- CONCRETE WASHOUT STRUCTURE
- ▨ SOIL RETENTION BLANKET
- ▨ ROCK CHECK DAM



**NOTES:**

- 1.) VEHICLE TRACKING PAD IS SHOWN FOR REFERENCE ONLY. VEHICLE TRACKING PAD WILL BE PLACED AT THE DISCRETION OF THE CONTRACTOR AT ALL POINTS OF INGRESS AND EGRESS AT THE SITE. VEHICLE TRACKING PAD SECTIONS ARE PLACED ON BARE SOIL AREAS AND REMOVED PRIOR TO FINAL PAVING.
- 2.) CONCRETE WASHOUT STRUCTURE IS SHOWN FOR REFERENCE ONLY. LOCATION WILL BE AT THE DISCRETION OF THE CONTRACTOR, AND APPROVED BY THE ENGINEER. CONCRETE WASHOUT STRUCTURE SHALL BE PLACED AT A MINIMUM OF 50 FEET AWAY FROM ANY WATERWAY.
- 3.) SILT FENCE SHALL BE USED ON FILL SLOPES AS SHOWN. EROSION LOGS CAN BE USED IN PLACE OF SILT FENCE, AND SHALL BE APPROVED BY THE ENGINEER.
- 4.) HYDROSEED CAN BE USED ON SLOPES 2:1 OR STEEPER.
- 5.) NO ITEMS ARE TO BE LOCATED IN THE CREEK OR CROSSING THE CREEK, UNLESS SHOWN ON PLANS OR APPROVED BY THE ENGINEER. MATERIALS, EQUIPMENT, AND STOCKPILES MUST NOT BE STORED OVERNIGHT BELOW THE ORDINARY HIGH WATER MARK.
- 6.) CONSTRUCTION FENCE (PLASTIC) SHALL BE INSTALLED WITHIN R.O.W. AND EASEMENTS AROUND LIMITS OF CONSTRUCTION (LOC).
- 7.) THIS IS A RECOMMENDED SWMP/EROSION CONTROL PLAN. THE CONTRACTOR IS RESPONSIBLE FOR DEVELOPING THEIR OWN SWMP BASED ON THEIR PROPOSED CONSTRUCTION ACTIVITY AND CDPE, CDOT SPECIFICATIONS. THE CONTRACTOR'S SWMP SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW.
- 8.) LOCATION OF STAGING SHALL BE AT THE DISCRETION OF THE CONTRACTOR, AND APPROVED BY THE ENGINEER. PERIMETER CONTROL SHALL BE INSTALLED AS NEEDED TO PREVENT SEDIMENT FROM ENTERING WATERWAYS. IT IS ANTICIPATED THAT STAGING AND STOCKPILING WILL REMAIN WITHIN THE LIMITS OF THE EXISTING ROADWAY. IF ADDITIONAL STAGING AREA IN THE COUNTY ROAD ROW IS NEEDED, THE CONTRACTOR SHALL MAKE REQUEST TO COUNTY IN WRITING. ADDITIONAL STAGING AREA IN ROAD ROW SHALL ONLY BE USED WITH COUNTY APPROVAL.

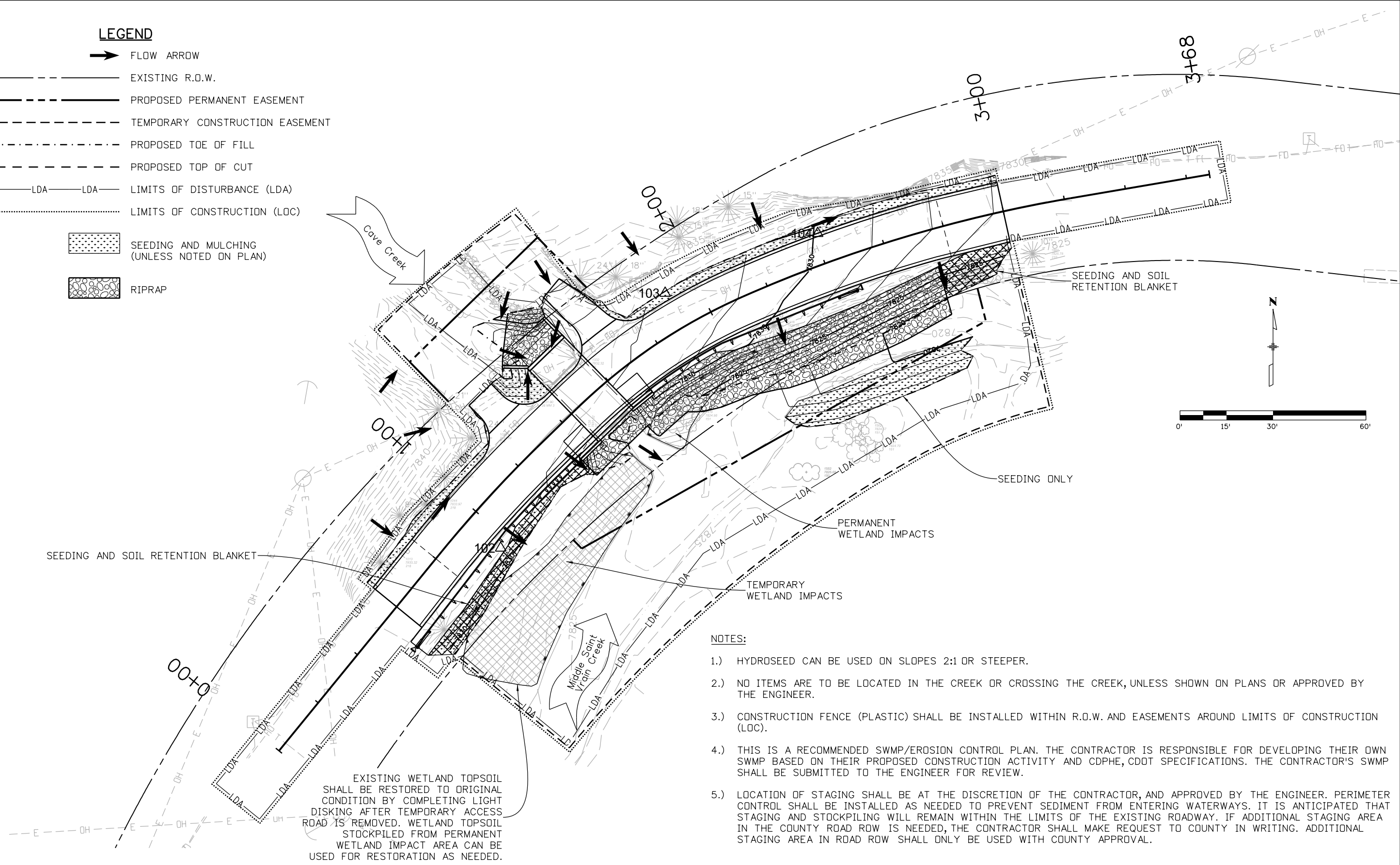
<b>FINAL</b>	<p style="font-size: 8px; margin: 0;">CALL UTILITY NOTIFICATION CENTER OF COLORADO CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES</p>	NO.	DATE	REVISION DESCRIPTION:	<p style="font-size: 8px; margin: 0;"><b>BOULDER COUNTY PUBLIC WORKS ENGINEERING DIVISION</b></p>	DESIGNED: SEK		CAD/C3D: DWS		CHECKED: SEK		DATE: 7/19/2023		PROJECT NO: <b>BC-103-009</b>	SHEET NO: <b>23</b>
		RIVERSIDE DR. STRUCTURE REPLACEMENT <b>INTERIM EROSION CONTROL PLAN</b>													

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**LEGEND**

- FLOW ARROW
- EXISTING R.O.W.
- PROPOSED PERMANENT EASEMENT
- - - TEMPORARY CONSTRUCTION EASEMENT
- · - · - PROPOSED TOE OF FILL
- - - PROPOSED TOP OF CUT
- LDA — LDA — LIMITS OF DISTURBANCE (LDA)
- LIMITS OF CONSTRUCTION (LOC)
- [Pattern] SEEDING AND MULCHING (UNLESS NOTED ON PLAN)
- [Pattern] RIPRAP



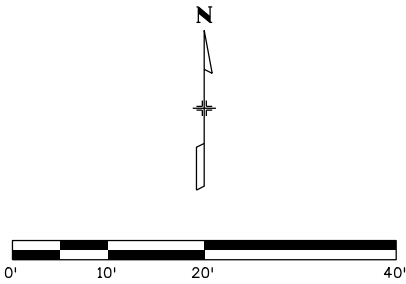
**NOTES:**

- 1.) HYDROSEED CAN BE USED ON SLOPES 2:1 OR STEEPER.
- 2.) NO ITEMS ARE TO BE LOCATED IN THE CREEK OR CROSSING THE CREEK, UNLESS SHOWN ON PLANS OR APPROVED BY THE ENGINEER.
- 3.) CONSTRUCTION FENCE (PLASTIC) SHALL BE INSTALLED WITHIN R.O.W. AND EASEMENTS AROUND LIMITS OF CONSTRUCTION (LOC).
- 4.) THIS IS A RECOMMENDED SWMP/EROSION CONTROL PLAN. THE CONTRACTOR IS RESPONSIBLE FOR DEVELOPING THEIR OWN SWMP BASED ON THEIR PROPOSED CONSTRUCTION ACTIVITY AND CDPE, CDOT SPECIFICATIONS. THE CONTRACTOR'S SWMP SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW.
- 5.) LOCATION OF STAGING SHALL BE AT THE DISCRETION OF THE CONTRACTOR, AND APPROVED BY THE ENGINEER. PERIMETER CONTROL SHALL BE INSTALLED AS NEEDED TO PREVENT SEDIMENT FROM ENTERING WATERWAYS. IT IS ANTICIPATED THAT STAGING AND STOCKPIILING WILL REMAIN WITHIN THE LIMITS OF THE EXISTING ROADWAY. IF ADDITIONAL STAGING AREA IN THE COUNTY ROAD ROW IS NEEDED, THE CONTRACTOR SHALL MAKE REQUEST TO COUNTY IN WRITING. ADDITIONAL STAGING AREA IN ROAD ROW SHALL ONLY BE USED WITH COUNTY APPROVAL.

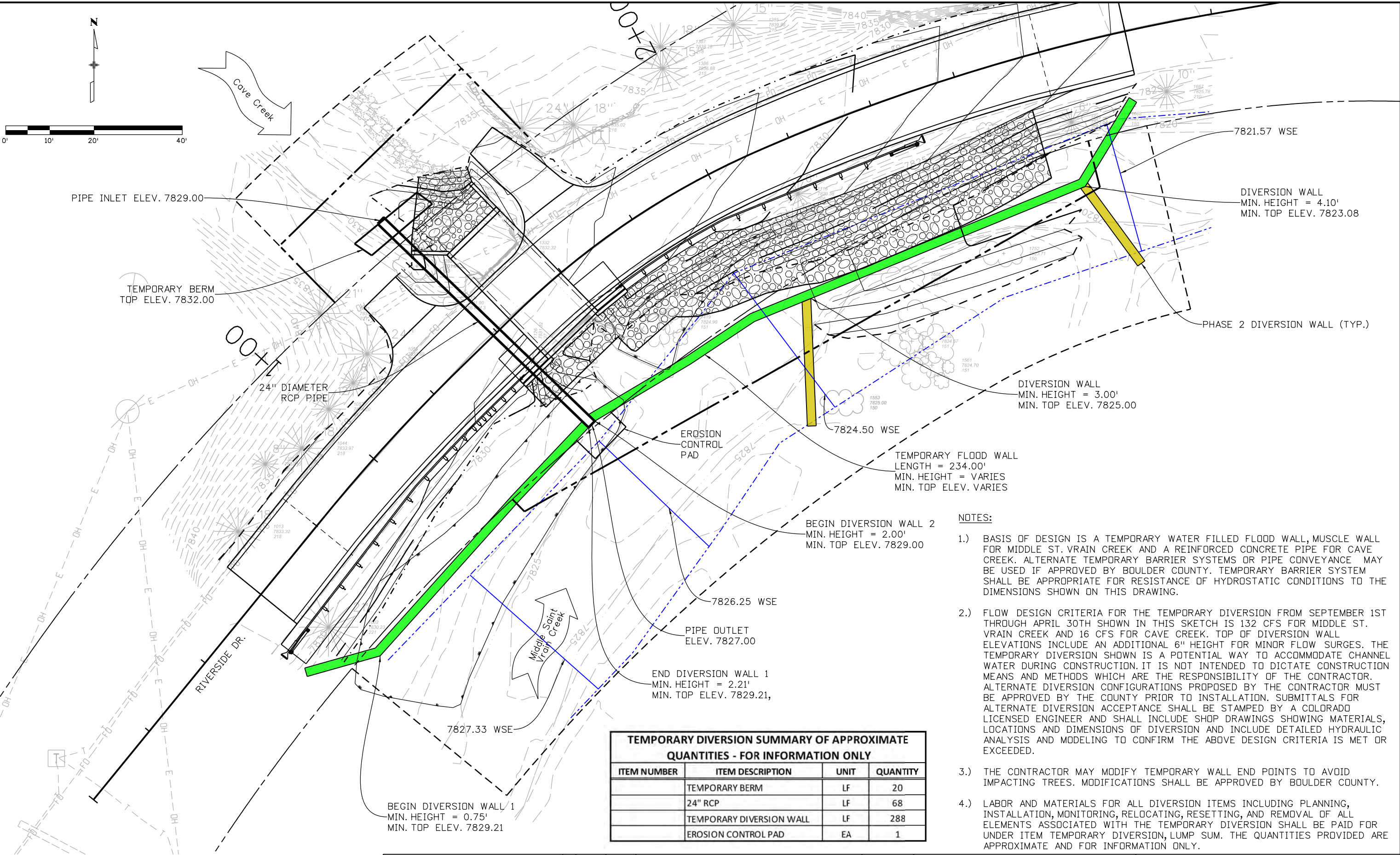
EXISTING WETLAND TOPSOIL SHALL BE RESTORED TO ORIGINAL CONDITION BY COMPLETING LIGHT DISKING AFTER TEMPORARY ACCESS ROAD IS REMOVED. WETLAND TOPSOIL STOCKPILED FROM PERMANENT WETLAND IMPACT AREA CAN BE USED FOR RESTORATION AS NEEDED.

<b>FINAL</b>	<p>CALL UTILITY NOTIFICATION CENTER OF COLORADO CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES</p>	NO.	DATE	REVISION DESCRIPTION:	<p><b>BOULDER COUNTY PUBLIC WORKS ENGINEERING DIVISION</b></p>	RIVERSIDE DR. STRUCTURE REPLACEMENT	
		DESIGNED: SEK	CAD/C3D: DWS	CHECKED: SEK		DATE: 7/19/2023	PROJECT NO: <b>BC-103-009</b>

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PIPE INLET ELEV. 7829.00

TEMPORARY BERM  
TOP ELEV. 7832.00

24" DIAMETER  
RCP PIPE

EROSION  
CONTROL  
PAD

TEMPORARY FLOOD WALL  
LENGTH = 234.00'  
MIN. HEIGHT = VARIES  
MIN. TOP ELEV. VARIES

BEGIN DIVERSION WALL 2  
MIN. HEIGHT = 2.00'  
MIN. TOP ELEV. 7829.00

END DIVERSION WALL 1  
MIN. HEIGHT = 2.21'  
MIN. TOP ELEV. 7829.21,

BEGIN DIVERSION WALL 1  
MIN. HEIGHT = 0.75'  
MIN. TOP ELEV. 7829.21

DIVERSION WALL  
MIN. HEIGHT = 4.10'  
MIN. TOP ELEV. 7823.08

PHASE 2 DIVERSION WALL (TYP.)

DIVERSION WALL  
MIN. HEIGHT = 3.00'  
MIN. TOP ELEV. 7825.00

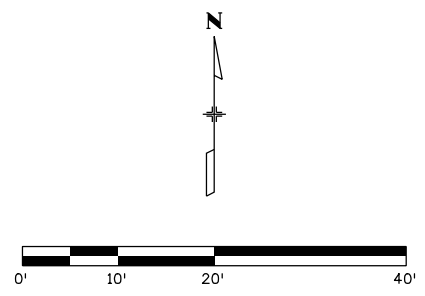
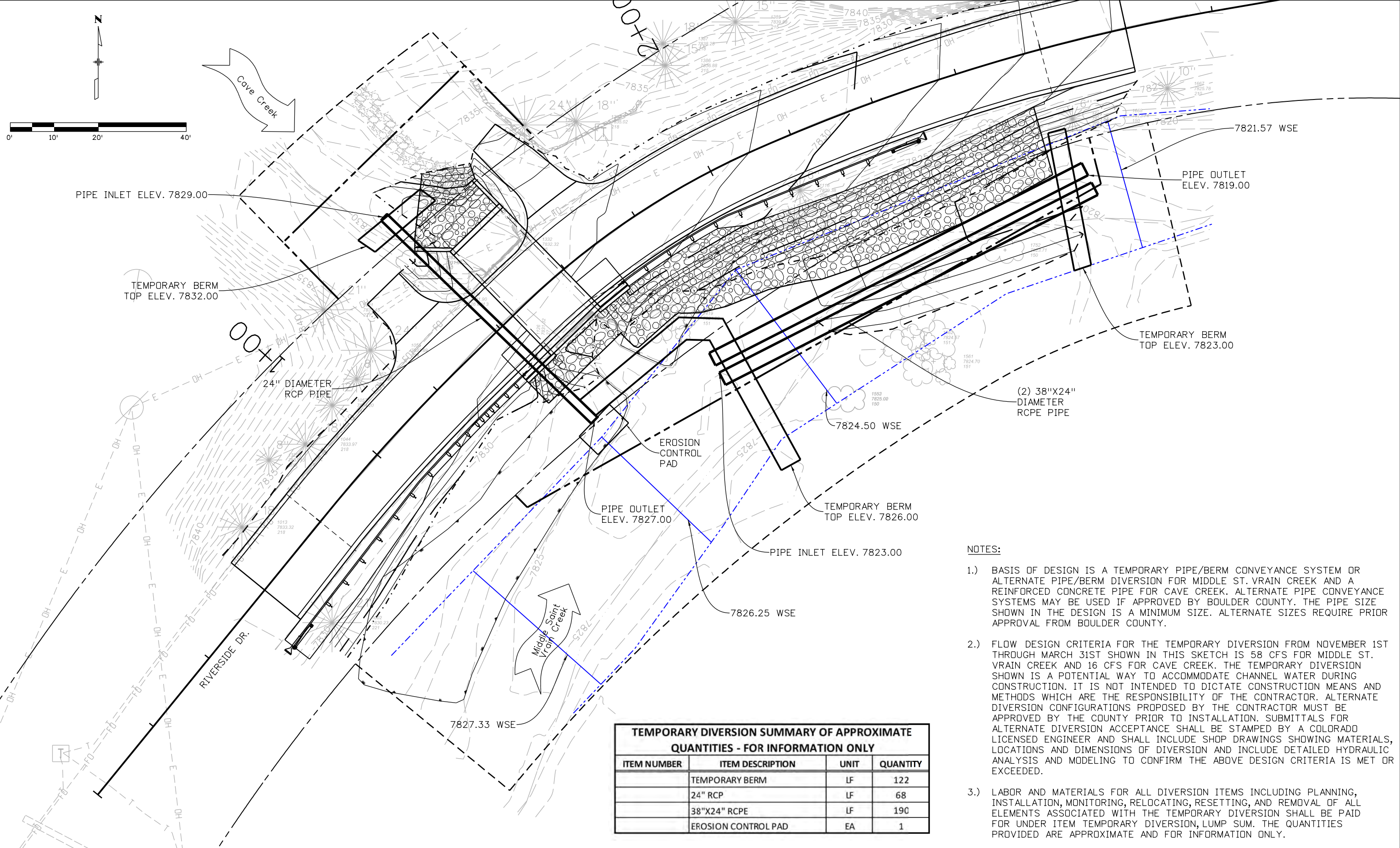
**NOTES:**

- 1.) BASIS OF DESIGN IS A TEMPORARY WATER FILLED FLOOD WALL, MUSCLE WALL FOR MIDDLE ST. VRAIN CREEK AND A REINFORCED CONCRETE PIPE FOR CAVE CREEK. ALTERNATE TEMPORARY BARRIER SYSTEMS OR PIPE CONVEYANCE MAY BE USED IF APPROVED BY BOULDER COUNTY. TEMPORARY BARRIER SYSTEM SHALL BE APPROPRIATE FOR RESISTANCE OF HYDROSTATIC CONDITIONS TO THE DIMENSIONS SHOWN ON THIS DRAWING.
- 2.) FLOW DESIGN CRITERIA FOR THE TEMPORARY DIVERSION FROM SEPTEMBER 1ST THROUGH APRIL 30TH SHOWN IN THIS SKETCH IS 132 CFS FOR MIDDLE ST. VRAIN CREEK AND 16 CFS FOR CAVE CREEK. TOP OF DIVERSION WALL ELEVATIONS INCLUDE AN ADDITIONAL 6" HEIGHT FOR MINOR FLOW SURGES. THE TEMPORARY DIVERSION SHOWN IS A POTENTIAL WAY TO ACCOMMODATE CHANNEL WATER DURING CONSTRUCTION. IT IS NOT INTENDED TO DICTATE CONSTRUCTION MEANS AND METHODS WHICH ARE THE RESPONSIBILITY OF THE CONTRACTOR. ALTERNATE DIVERSION CONFIGURATIONS PROPOSED BY THE CONTRACTOR MUST BE APPROVED BY THE COUNTY PRIOR TO INSTALLATION. SUBMITTALS FOR ALTERNATE DIVERSION ACCEPTANCE SHALL BE STAMPED BY A COLORADO LICENSED ENGINEER AND SHALL INCLUDE SHOP DRAWINGS SHOWING MATERIALS, LOCATIONS AND DIMENSIONS OF DIVERSION AND INCLUDE DETAILED HYDRAULIC ANALYSIS AND MODELING TO CONFIRM THE ABOVE DESIGN CRITERIA IS MET OR EXCEEDED.
- 3.) THE CONTRACTOR MAY MODIFY TEMPORARY WALL END POINTS TO AVOID IMPACTING TREES. MODIFICATIONS SHALL BE APPROVED BY BOULDER COUNTY.
- 4.) LABOR AND MATERIALS FOR ALL DIVERSION ITEMS INCLUDING PLANNING, INSTALLATION, MONITORING, RELOCATING, RESETTING, AND REMOVAL OF ALL ELEMENTS ASSOCIATED WITH THE TEMPORARY DIVERSION SHALL BE PAID FOR UNDER ITEM TEMPORARY DIVERSION, LUMP SUM. THE QUANTITIES PROVIDED ARE APPROXIMATE AND FOR INFORMATION ONLY.

TEMPORARY DIVERSION SUMMARY OF APPROXIMATE QUANTITIES - FOR INFORMATION ONLY			
ITEM NUMBER	ITEM DESCRIPTION	UNIT	QUANTITY
	TEMPORARY BERM	LF	20
	24" RCP	LF	68
	TEMPORARY DIVERSION WALL	LF	288
	EROSION CONTROL PAD	EA	1

<b>FINAL</b>	CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES	CALL UTILITY NOTIFICATION CENTER OF COLORADO		NO.	DATE	REVISION DESCRIPTION:		<b>BOULDER COUNTY PUBLIC WORKS ENGINEERING DIVISION</b>		RIVERSIDE DR. STRUCTURE REPLACEMENT	
		DESIGNED: SEK	CAD/C3D: DWS	CHECKED: SEK	DATE: 7/17/2023	<b>SUGGESTED TEMPORARY DIVERSION - OPTION 1</b>		PROJECT NO: <b>BC-103-009</b>	SHEET NO: <b>25</b>		

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**NOTES:**

- 1.) BASIS OF DESIGN IS A TEMPORARY PIPE/BERM CONVEYANCE SYSTEM OR ALTERNATE PIPE/BERM DIVERSION FOR MIDDLE ST. VRAIN CREEK AND A REINFORCED CONCRETE PIPE FOR CAVE CREEK. ALTERNATE PIPE CONVEYANCE SYSTEMS MAY BE USED IF APPROVED BY BOULDER COUNTY. THE PIPE SIZE SHOWN IN THE DESIGN IS A MINIMUM SIZE. ALTERNATE SIZES REQUIRE PRIOR APPROVAL FROM BOULDER COUNTY.
- 2.) FLOW DESIGN CRITERIA FOR THE TEMPORARY DIVERSION FROM NOVEMBER 1ST THROUGH MARCH 31ST SHOWN IN THIS SKETCH IS 58 CFS FOR MIDDLE ST. VRAIN CREEK AND 16 CFS FOR CAVE CREEK. THE TEMPORARY DIVERSION SHOWN IS A POTENTIAL WAY TO ACCOMMODATE CHANNEL WATER DURING CONSTRUCTION. IT IS NOT INTENDED TO DICTATE CONSTRUCTION MEANS AND METHODS WHICH ARE THE RESPONSIBILITY OF THE CONTRACTOR. ALTERNATE DIVERSION CONFIGURATIONS PROPOSED BY THE CONTRACTOR MUST BE APPROVED BY THE COUNTY PRIOR TO INSTALLATION. SUBMITTALS FOR ALTERNATE DIVERSION ACCEPTANCE SHALL BE STAMPED BY A COLORADO LICENSED ENGINEER AND SHALL INCLUDE SHOP DRAWINGS SHOWING MATERIALS, LOCATIONS AND DIMENSIONS OF DIVERSION AND INCLUDE DETAILED HYDRAULIC ANALYSIS AND MODELING TO CONFIRM THE ABOVE DESIGN CRITERIA IS MET OR EXCEEDED.
- 3.) LABOR AND MATERIALS FOR ALL DIVERSION ITEMS INCLUDING PLANNING, INSTALLATION, MONITORING, RELOCATING, RESETTING, AND REMOVAL OF ALL ELEMENTS ASSOCIATED WITH THE TEMPORARY DIVERSION SHALL BE PAID FOR UNDER ITEM TEMPORARY DIVERSION, LUMP SUM. THE QUANTITIES PROVIDED ARE APPROXIMATE AND FOR INFORMATION ONLY.

TEMPORARY DIVERSION SUMMARY OF APPROXIMATE QUANTITIES - FOR INFORMATION ONLY			
ITEM NUMBER	ITEM DESCRIPTION	UNIT	QUANTITY
	TEMPORARY BERM	LF	122
	24" RCP	LF	68
	38"X24" RCPE	LF	190
	EROSION CONTROL PAD	EA	1

<b>FINAL</b>	 <small>CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES</small>	NO.	DATE	REVISION DESCRIPTION:	 <b>BOULDER COUNTY PUBLIC WORKS ENGINEERING DIVISION</b>	RIVERSIDE DR. STRUCTURE REPLACEMENT	
		DESIGNED:	CAD/C3D:	CHECKED:		DATE:	PROJECT NO: <b>BC-103-009</b>
		SEK	DWS	SEK	7/17/2023	<b>SUGGESTED TEMPORARY DIVERSION - OPTION 2</b>	

**GENERAL NOTES**

STRUCTURE EXCAVATION AND BACKFILL SHALL BE IN ACCORDANCE WITH THE PLANS AND STANDARD M-206-1.

EXPANSION JOINT MATERIAL SHALL MEET AASHTO SPECIFICATION M-213. IT WILL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE WORK.

ALL EXPOSED SUBSTRUCTURE CONCRETE SURFACES SHALL RECEIVE STRUCTURAL CONCRETE COATING TO ONE FOOT BELOW THE GROUND LINE. SEE PLANS FOR SUPERSTRUCTURE STRUCTURAL CONCRETE COATING LOCATIONS. THE STRUCTURAL CONCRETE COATING COLOR SHALL BE DAVIS COLOR MESA BUFF (5447). CONCRETE SURFACE PREPARATION SHALL BE PERFORMED IN ACCORDANCE WITH CDOT SPECIFICATIONS 601.14-4.

ALL CAST-IN-PLACE CONCRETE SHALL HAVE A CLASS 3 FINISH IN ACCORDANCE WITH CDOT SPECIFICATIONS, UNLESS OTHERWISE APPROVED BY BOULDER COUNTY.

ALL EXPOSED CORNERS ON CONCRETE ARE TO BE CHAMFERED 3/4".

ALL CONSTRUCTION JOINTS SHALL BE THOROUGHLY CLEANED BEFORE FRESH CONCRETE IS POURED.

ALL CONSTRUCTION JOINTS NOT SHOWN ON THE PLANS SHALL BE APPROVED BY THE ENGINEER.

GRADE 60 REINFORCING STEEL IS REQUIRED.

ALL REINFORCING STEEL SHALL BE EPOXY COATED UNLESS OTHERWISE NOTED.

REINFORCING STEEL SHALL BE INCLUDED IN THE COST OF CONCRETE CLASS D (BOX CULVERT).

ALL DIMENSIONS FOR BENT BARS ARE OUT TO OUT.

E.F. = EACH FACE                      O.F. = OUTSIDE FACE  
 F.F. = FAR FACE                      I.F. = INSIDE FACE  
 N.F. = NEAR FACE

ALL LONGITUDINAL AND TRANSVERSE DIMENSIONS ARE MEASURED HORIZONTALLY AND INCLUDE NO CORRECTION FOR GRADE.

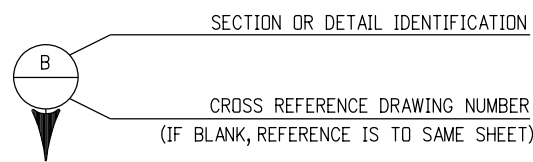
THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE STABILITY OF THE STRUCTURE AND EXCAVATIONS DURING CONSTRUCTION.

THE INFORMATION SHOWN ON THESE PLANS CONCERNING THE TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. THE CONTRACTOR IS RESPONSIBLE FOR MAKING THEIR OWN DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERETO. THE CONTRACTOR SHALL CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO AT 1-800-922-1987 AT LEAST 3 DAYS (NOT INCLUDING THE DAY OF NOTIFICATION) PRIOR TO ANY EXCAVATION OR OTHER EARTHWORK.

STATIONS, ELEVATIONS, AND DIMENSIONS CONTAINED IN THESE PLANS ARE CALCULATED FROM A RECENT SURVEY. THE CONTRACTOR SHALL VERIFY ALL DEPENDENT DIMENSIONS IN THE FIELD BEFORE ORDERING OR FABRICATING ANY MATERIAL.

SEVERITY OF POTENTIAL SULFATE EXPOSURE FOR CONCRETE IS CLASS 0 FOR THIS PROJECT.

NATURAL FILL MATERIAL TO BE PAID FOR AS STRUCTURAL BACKFILL (CLASS 2) AND VISUALLY APPROVED BY THE COUNTY.



**TEMPORARY SHORING**

THE LOCATION, EXTENTS AND DIMENSIONS OF TEMPORARY SHORING ARE SCHEMATIC AND FOR INFORMATION ONLY. THE MEANS AND METHODS FOR TEMPORARY SHORING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. A TEMPORARY SHORING PLAN DESCRIBING THE SHORING SYSTEM INCLUDING CALCULATIONS STAMPED BY A COLORADO PROFESSIONAL ENGINEER DEMONSTRATING THE ADEQUACY OF THE SHORING SHALL BE SUBMITTED BY THE CONTRACTOR AT LEAST TWO WEEKS PRIOR TO INSTALLATION IN ACCORDANCE WITH CDOT SPECIFICATION SECTION 206. PAYMENT FOR TEMPORARY SHORING SHALL INCLUDE PLANNING, DESIGN, INSTALLATION, MAINTENANCE, AND REMOVAL OF THE TEMPORARY SHORING SYSTEM TO CONSTRUCT THE PROJECT AND MAINTAIN ACCESS TO ADJACENT DRIVEWAYS.

**SUMMARY OF QUANTITIES**

ITEM NO.	DESCRIPTION	UNIT	TOTAL
202	REMOVAL OF BRIDGE	EACH	1
206	STRUCTURE EXCAVATION	CU.YD.	144
206	STRUCTURE BACKFILL (CLASS 1)	CU.YD.	80
206	STRUCTURE BACKFILL (CLASS 2)	CU.YD.	40
206	TEMPORARY EXCAVATION SUPPORT	LS	1
515	WATERPROOFING MEMBRANE	SQ.YD.	65
601	CONCRETE CLASS D (BOX CULVERT)	CU.YD.	36
601	STRUCTURAL CONCRETE COATING	SQ.YD.	50
* 602	REINFORCING STEEL (EPOXY COATED)	LB.	3,525
602	DRILL AND GROUT REBAR	EACH	140
603	14x7 CONCRETE BOX CULVERT (PRECAST)	LIN.FT.	33
606	CAST-IN-PLACE RAIL	LIN.FT.	48

\* REINFORCING STEEL QUANTITY IS FOR CAST-IN-PLACE CONCRETE ONLY. FOR PRECAST CONCRETE BOX CULVERT, REINFORCING IS INCLUDED IN THE ITEM AND NOT QUANTIFIED SEPARATELY.

**DESIGN DATA:**

DESIGN: AASHTO 8TH EDITION, LRFD BRIDGE DESIGN SPECIFICATIONS 2017.

LIVE LOAD: AASHTO HL-93 (DESIGN TRUCK OR TANDEM, AND DESIGN LANE LOAD)

DEAD LOAD: ASSUMES 36.67 LBS. PER SQ. FT. FOR HMA WEARING SURFACE

REINFORCED CONCRETE:

CLASS D CONCRETE:  $f'c = 4,500$  psi

REINFORCING STEEL:  $f_y = 60,000$  psi

MIN. FILL HEIGHT = 1'-0<sup>3</sup>/<sub>4</sub>"

MAX. FILL HEIGHT = 1'-6<sup>1</sup>/<sub>8</sub>"

TEXAS DOT DOGHOUSE RAIL: MASH TL-2, 45 MPH

**INDEX OF DRAWINGS**

DWG. NO.	DESCRIPTION
B1	GENERAL INFORMATION - SUMMARY OF QUANTITIES
B2	GENERAL LAYOUT
B3	ENGINEERING GEOLOGY
B4	BRIDGE HYDRAULIC INFORMATION
B5-B7	CBC DETAILS
B8-B9	CAST-IN-PLACE DOGHOUSE RAIL

**BRIDGE DESCRIPTION**

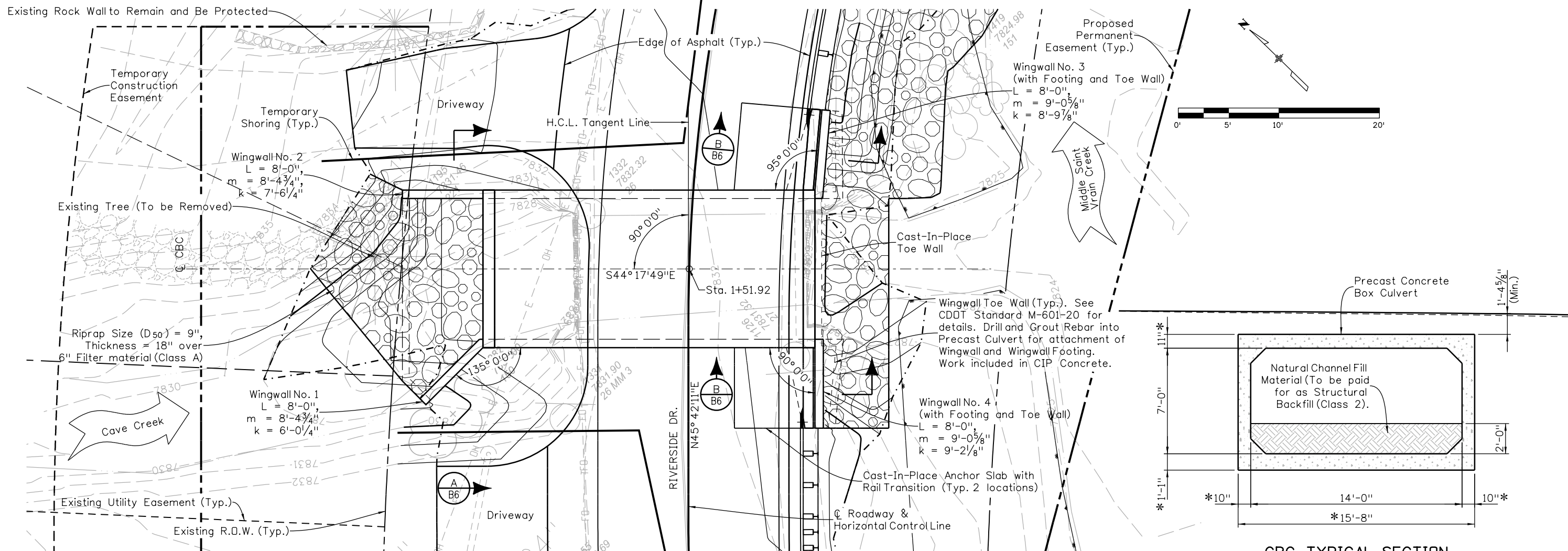
14'-0" x 7'-0" PRECAST CONCRETE BOX CULVERT

OVER CAVE CREEK

20'-0" ROADWAY, HEADWALL MOUNTED DOGHOUSE RAIL 90° SKEW

FOR BURIED UTILITY INFORMATION  
**THREE (3) BUSINESS DAYS BEFORE YOU DIG**  
**CALL 811**  
 (or 1-800-922-1987)  
 UTILITY NOTIFICATION CENTER OF COLORADO (UNCC)  
[www.uncc.org](http://www.uncc.org)

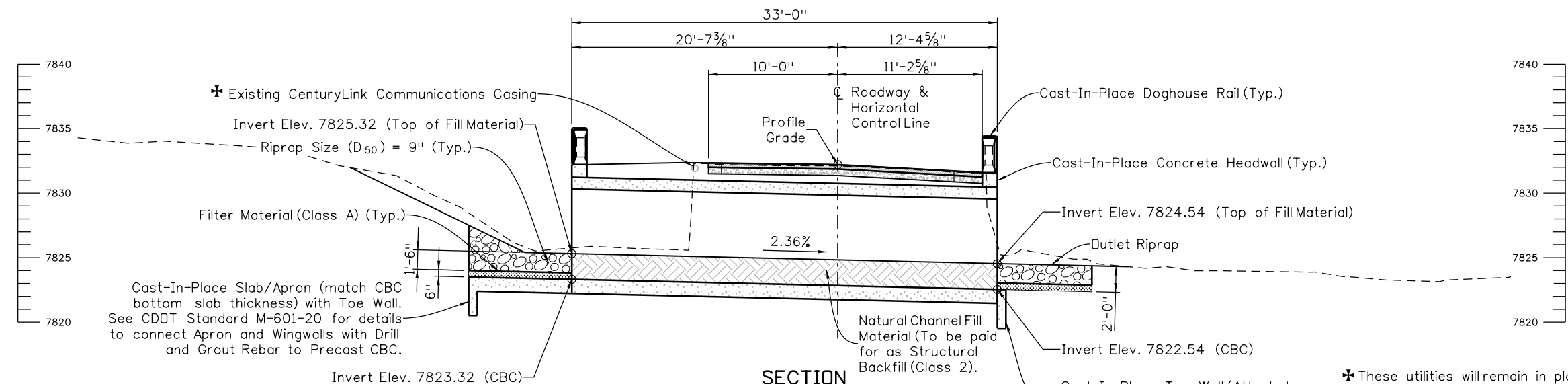
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PLAN

CBC TYPICAL SECTION

(Taken at  $\bar{C}$  H.C.L.)  
\* Verify with Final Precast Box Design.



SECTION  
(Taken at  $\bar{C}$  CBC)

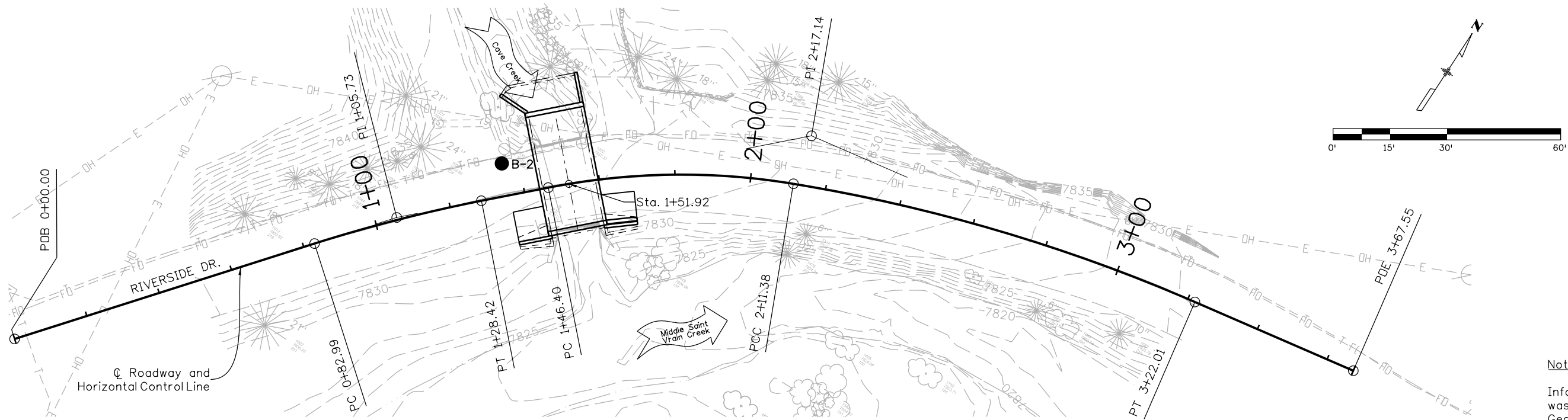
HYDRAULIC DATA \*

WSE = 7831.62  
V = 5.46 FPS  
Q = 395 CFS

\* (Data is for the 100 Yr. event at the upstream face of structure)

\* These utilities will remain in place during construction and be temporarily supported and relocated by the Contractor (see Specifications for more details). The final utility location will be determined by the utility owner, but is anticipated to be in the same general location as the current location, but outside the footprint of the proposed roadway pavement. The utility owner has proposed to provide a protective utility covering consisting of flow-fill after precast box installation. The Contractor shall coordinate with the utility owner as described in the Specifications.

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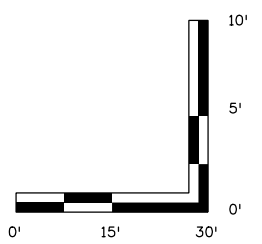
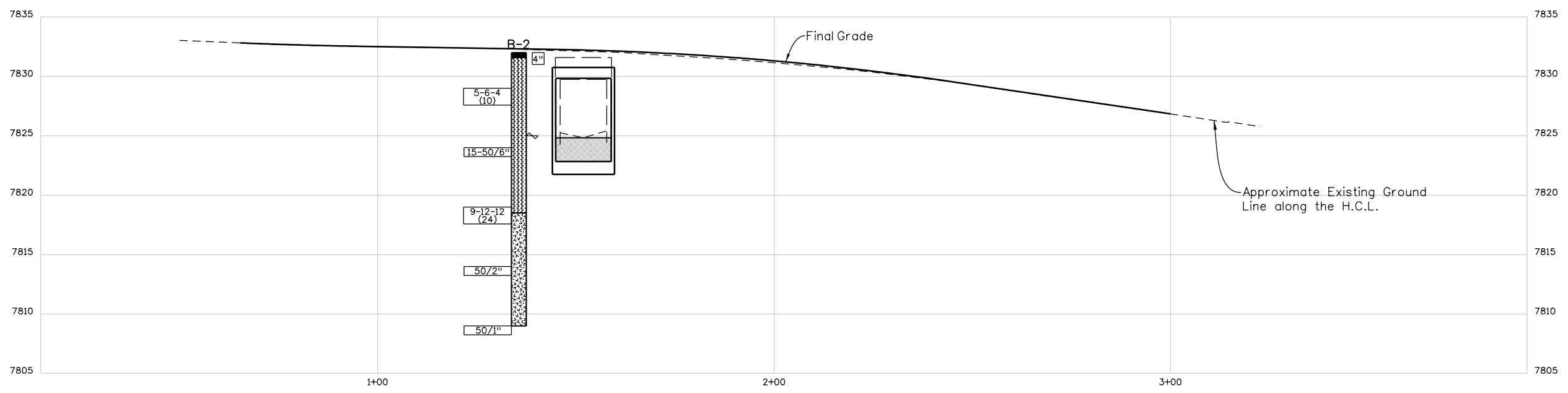


**Notes:**  
 Information for this drawing was taken from a report of Geotechnical Engineering Recommendations dated September 17, 2019 and prepared by:

GEOCAL  
 7290 South Fraser Street  
 Centennial, Colorado 80112  
 (Project No. G18.1853.000)

▲ Standard Penetration Test Sampler  
 (The final two numbers added together is the N Value).

★ Modified California Liner Sampler



Sample No.	Depth (ft)	Classification	Grading Analysis (AASHTO)				Atterberg Limits			Water Content %	Dry Unit Weight p.c.f.
			Gravel	Percent		Liquid Limit %	Plastic Limit %	Plasticity Index %			
				Coarse Sand	Fine Sand				Silt and Clay		
B-2	1-5	Silty sand	31	55	-	-	NV	NP	2.4	-	
B-2	13	Sand with silt and gravel	54	40	-	-	NV	NP	13.9	-	
B-2	15-23	Bedrock	-	-	-	-	-	-	6.5	-	

**TYPE OF MATERIAL**

- Asphalt
- ▨ Silty Sand with Gravel
- ▨ Granite Bedrock

**LEGEND**

**TEST BORING**

- Location of Test Boring
- Location of Continuous Penetration Test
- Wireline Boring
- Rotary Boring
- ◇ Auger Boring

**CONTINUOUS PENETRATION TEST**

2 Inch Diameter Drive Point  
 30 Inch Free Fall  
 140 Pound Hammer

Blows per Foot \*  
 R = Refusal

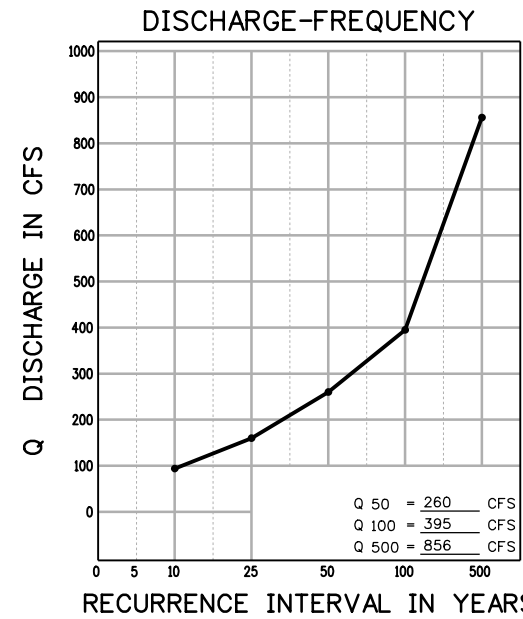
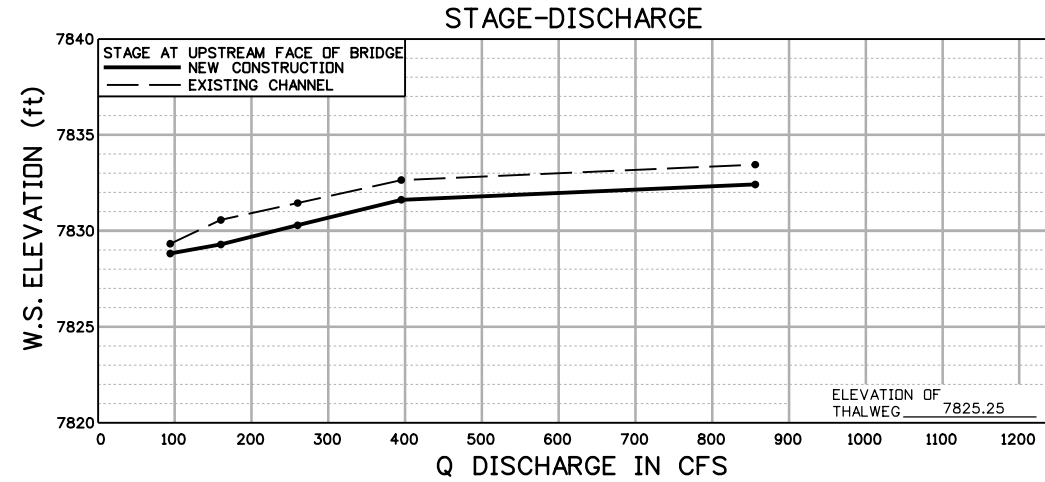
▲ 6" Blow Counts (N Value)  
 ★ 6" Blow Counts

Core Recovery  
 R.Q.D.

\*Standard Penetration Test (AASHTO T 206-74)

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# BRIDGE HYDRAULIC INFORMATION



DESIGN EVENT RECURRENCE INTERVAL: 100 YEARS

### CHANNEL DESCRIPTION

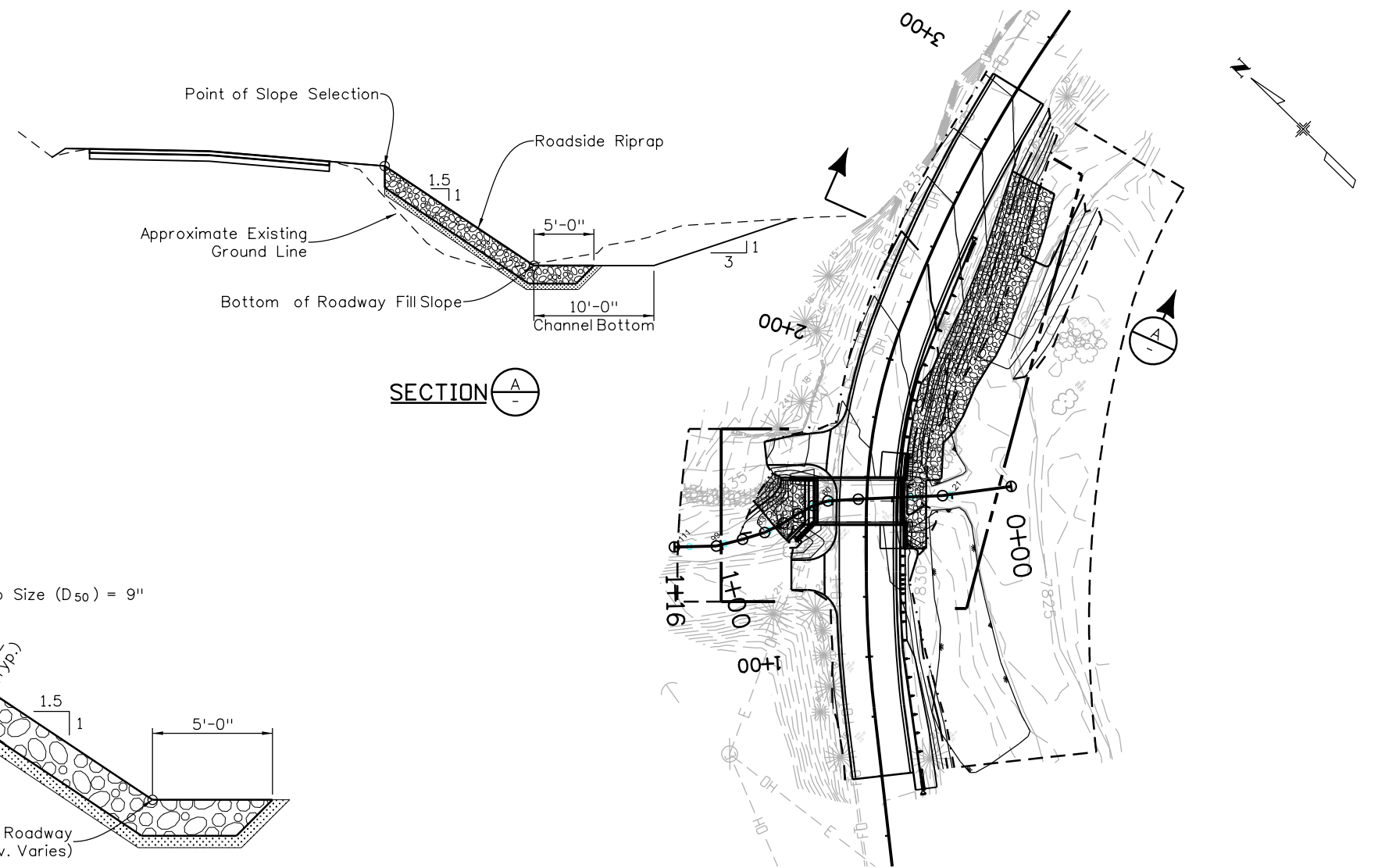
Bottom Material - Cohesive  Non Cohesive   
 Bottom Material Size - Clay  Silt  Sand  Gravel   
 Cobbles  Note silty sands, silts, silty clays  
 Stream Form - Straight  Meandering  Braided   
 Mannings "n" for Design - Channel 0.040 Overbank 0.015 to 0.055  
 Debris - Brush  Trees/Logs  Ice  Note -  
 Drainage Area = 5.54 Square Miles

### COMPARISON OF HYDRAULICS (50 Yr.)

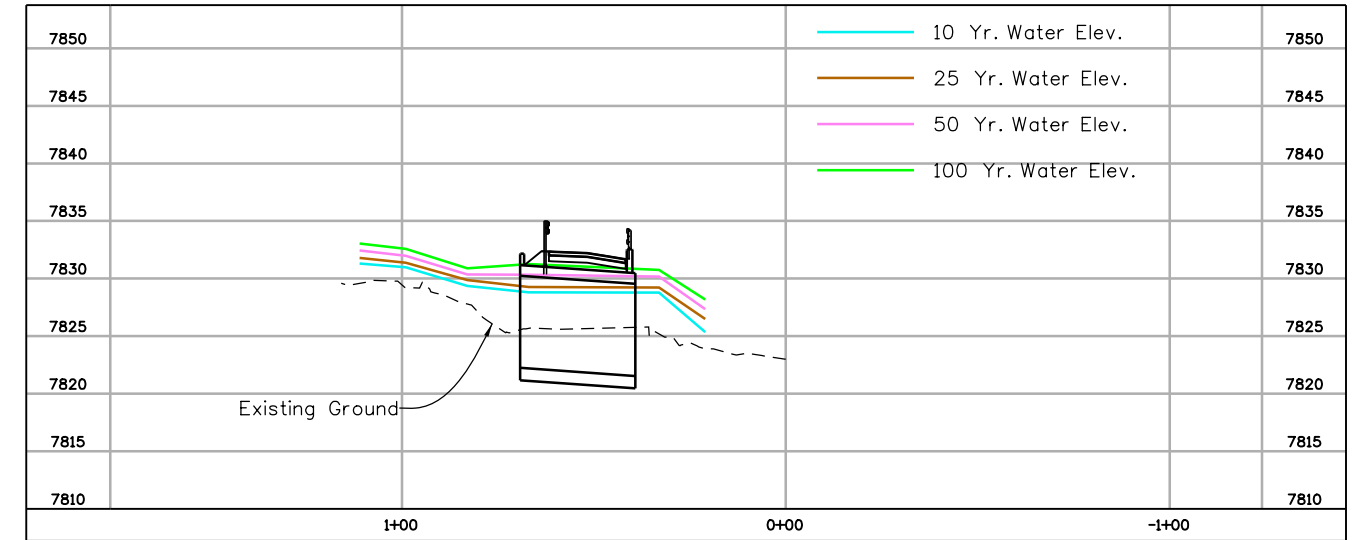
	Velocity (50 yr.) (fps)	Freeboard (50 yr.) (ft.)
Existing	3.92	0.57
Proposed	3.73	1.97

### COMPARISON OF HYDRAULICS (100 Yr.)

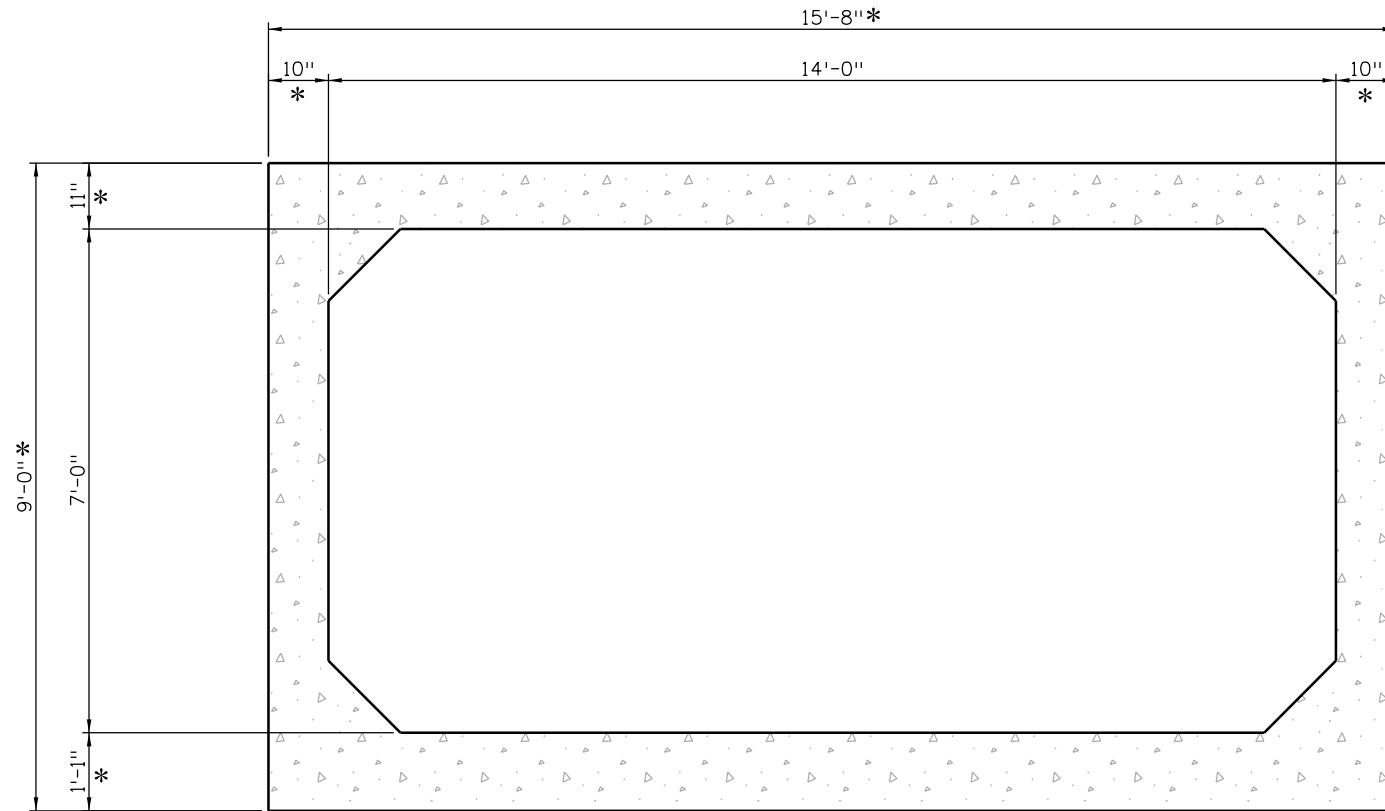
	Velocity (100 yr.) (fps)	Freeboard (100 yr.) (ft.)
Existing	4.52	-0.63
Proposed	5.46	0.64



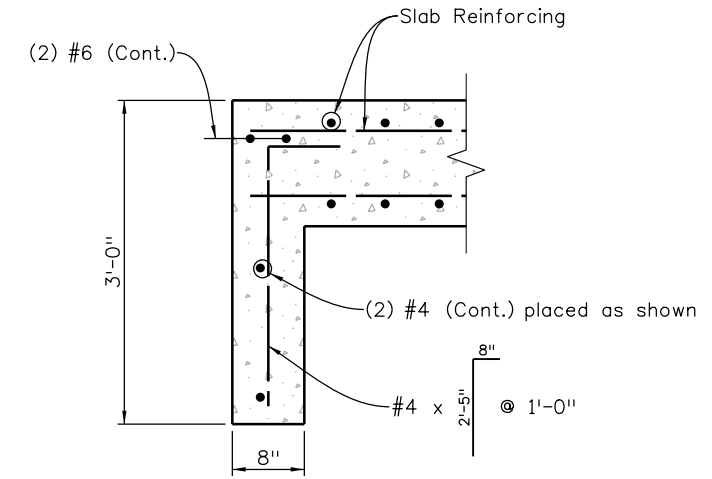
ROADSIDE RIPRAP TYPICAL SECTION



PROFILE OF DESIGN WATER SURFACE



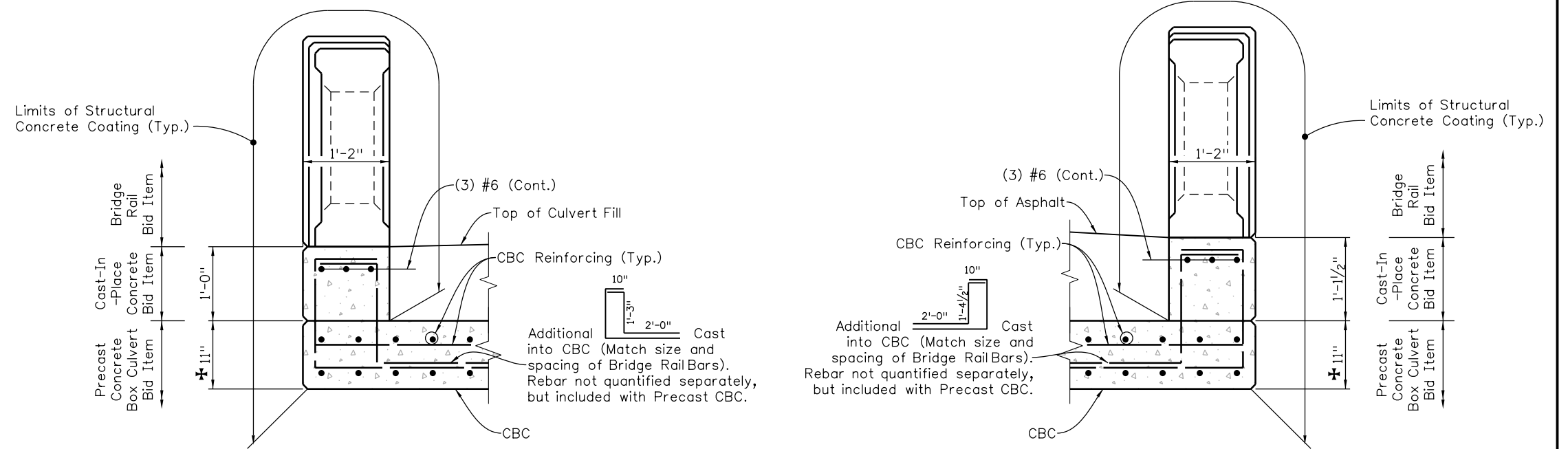
**PRECAST CBC TYPICAL SECTION**



**TYPICAL CAST-IN-PLACE TOE WALL**

\* PRECAST CONCRETE BOX CULVERT SHALL BE IN ACCORDANCE WITH CDDT M-603-3. THE CONTRACTOR SHALL PROVIDE A DESIGN AND A LRFR LOAD RATING FOR THE PRECAST CONCRETE BOX CULVERT THAT CONFORMS TO THE REQUIREMENTS OF ASTM C 1577 AND IS STAMPED AND SIGNED BY A COLORADO LICENSED ENGINEER. THE DESIGN SHALL SPECIFY THE THICKNESS OF TOP AND BOTTOM SLAB, WALLS, AND SIZE AND SPACING OF ALL REINFORCING STEEL. THE DIMENSIONS SHOWN ARE FOR INFORMATION ONLY, BUT INTERIOR DIMENSIONS SHALL BE 14'-0" WIDE X 7'-0" HIGH.

NOTE: A WATERPROOFING MEMBRANE OR 30 ML THICK GEOMEMBRANE SHALL BE PROVIDED FOR THE TOP OF THE TOP SLAB AND 18 INCHES DOWN ALONG THE TOPS OF THE EXTERIOR WALLS.



**UPSTREAM HEADWALL REINFORCING**

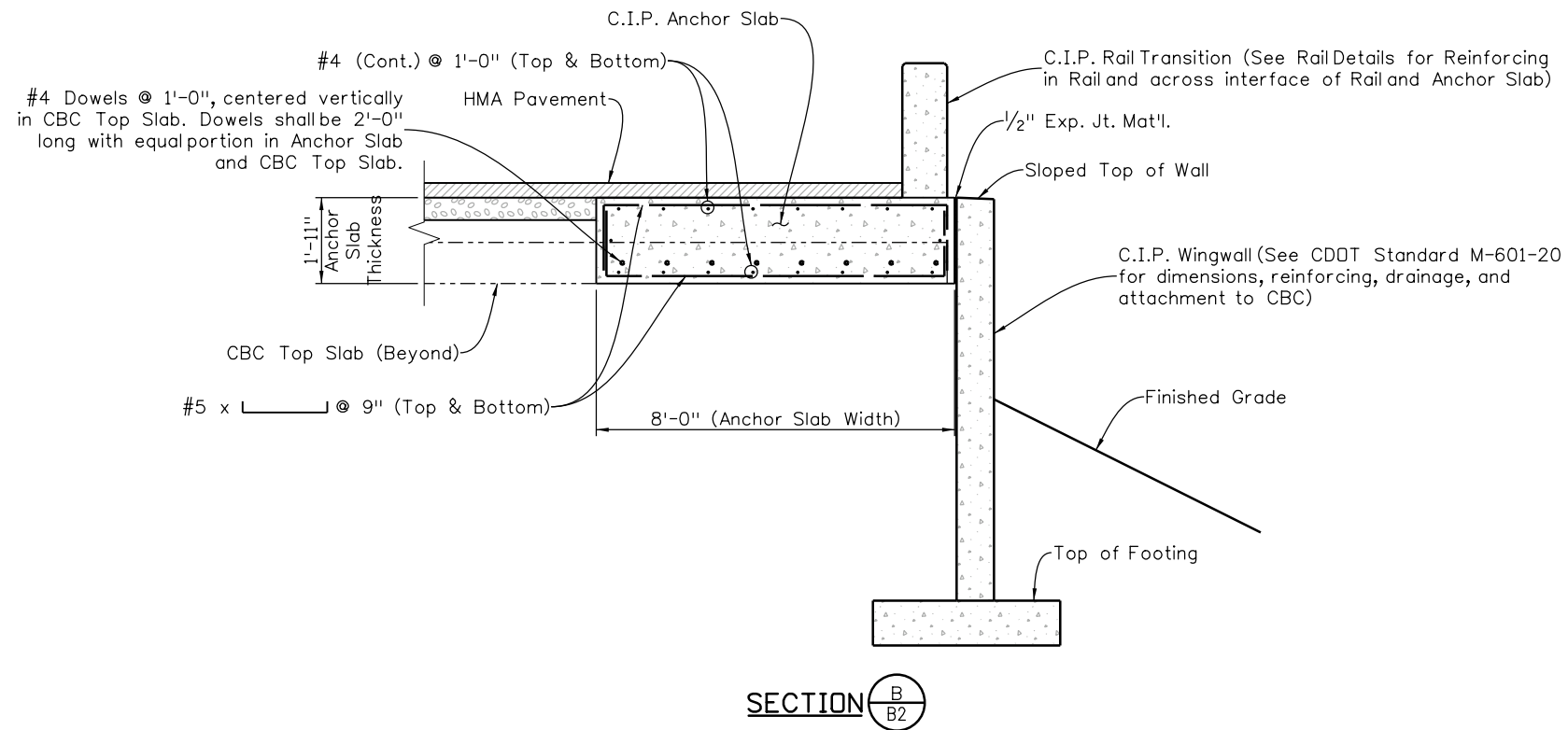
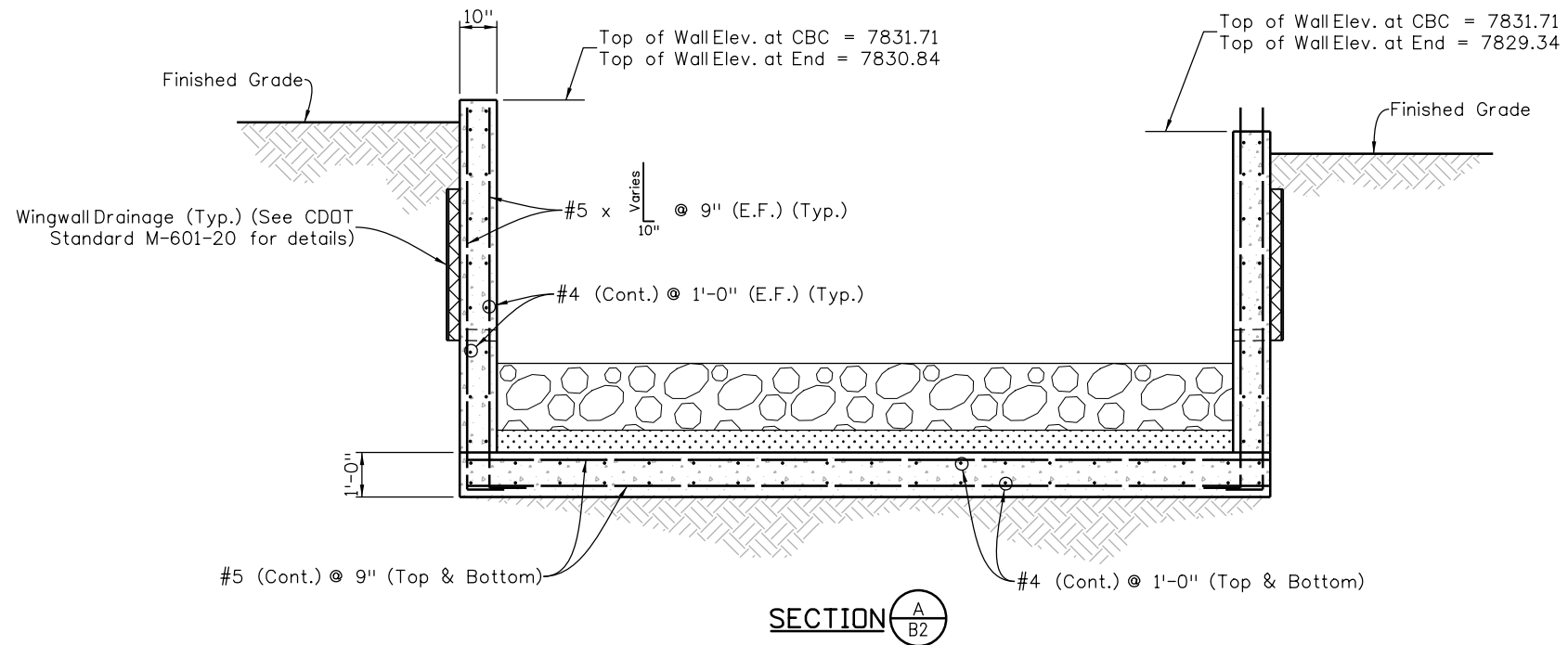
**DOWNSTREAM HEADWALL REINFORCING**

✦ Verify with Final Precast Box Design

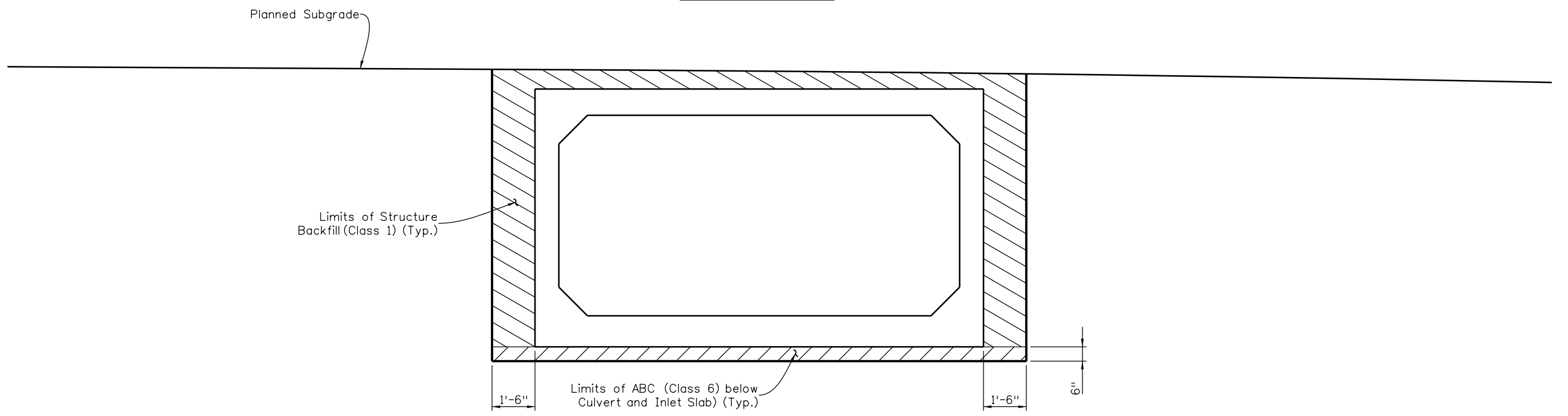
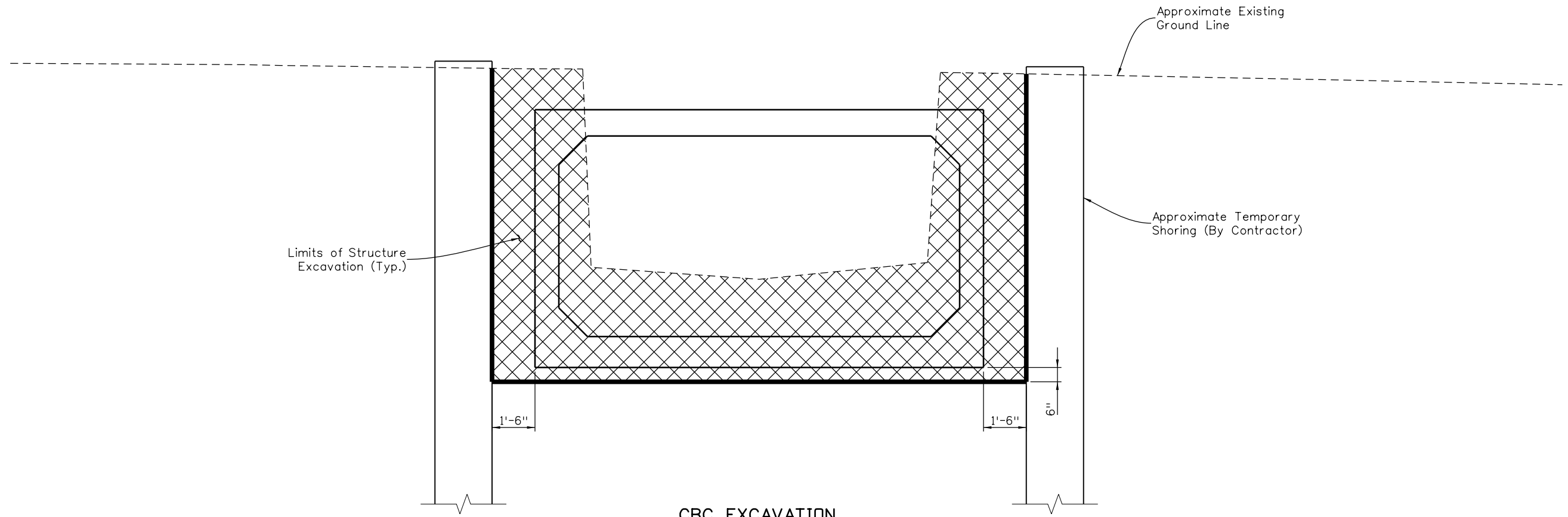
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		DESIGNED: SEK	CAD/C3D: DWS	CHECKED: SEK	DATE: 7/7/2023		<b>CBC DETAILS</b>			
						PROJECT NO: <b>BC-103-009</b>		SHEET NO: <b>31</b>		



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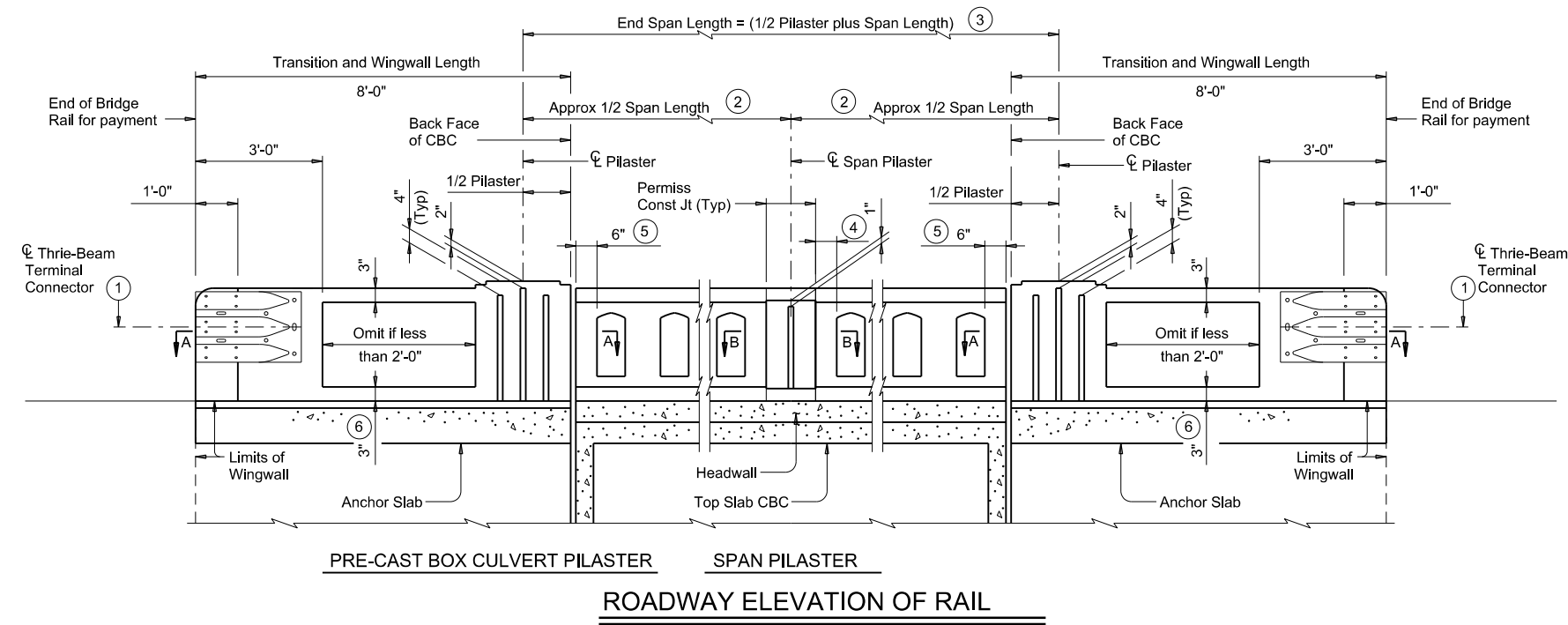


<b>FINAL</b>	<p>CALL UTILITY NOTIFICATION CENTER OF COLORADO CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES</p>	NO.	DATE	REVISION DESCRIPTION:	<p><b>BOULDER COUNTY PUBLIC WORKS ENGINEERING DIVISION</b></p>	RIVERSIDE DR. STRUCTURE REPLACEMENT		
		DESIGNED:	CAD/C3D:	CHECKED:		DATE:	<b>CBC DETAILS</b>	
		SEK	DWS	SEK		7/7/2023	PROJECT NO: <b>BC-103-009</b>	SHEET NO: <b>32</b>

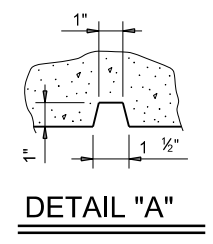
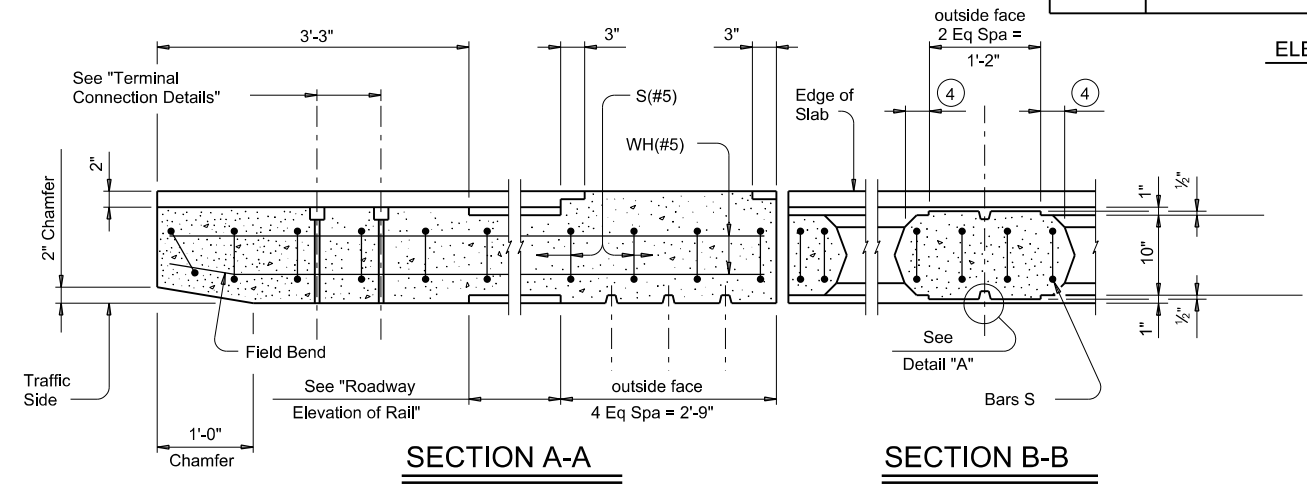
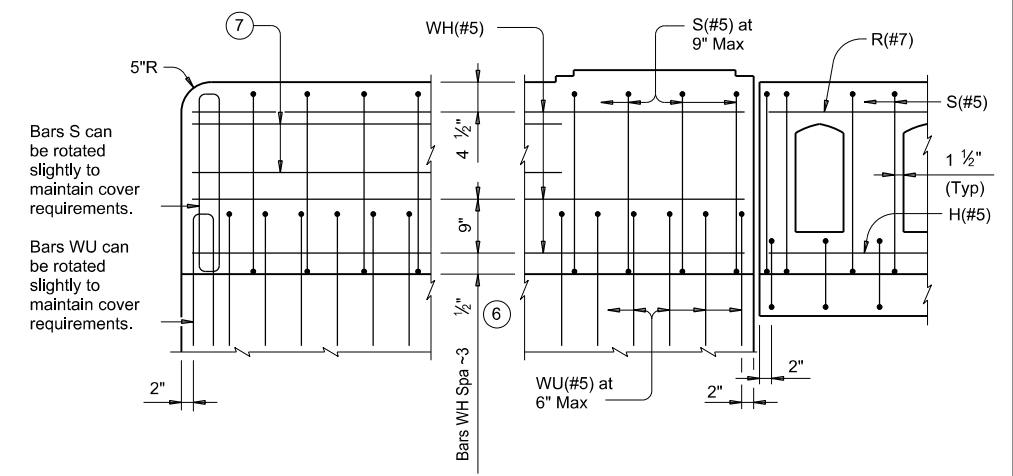
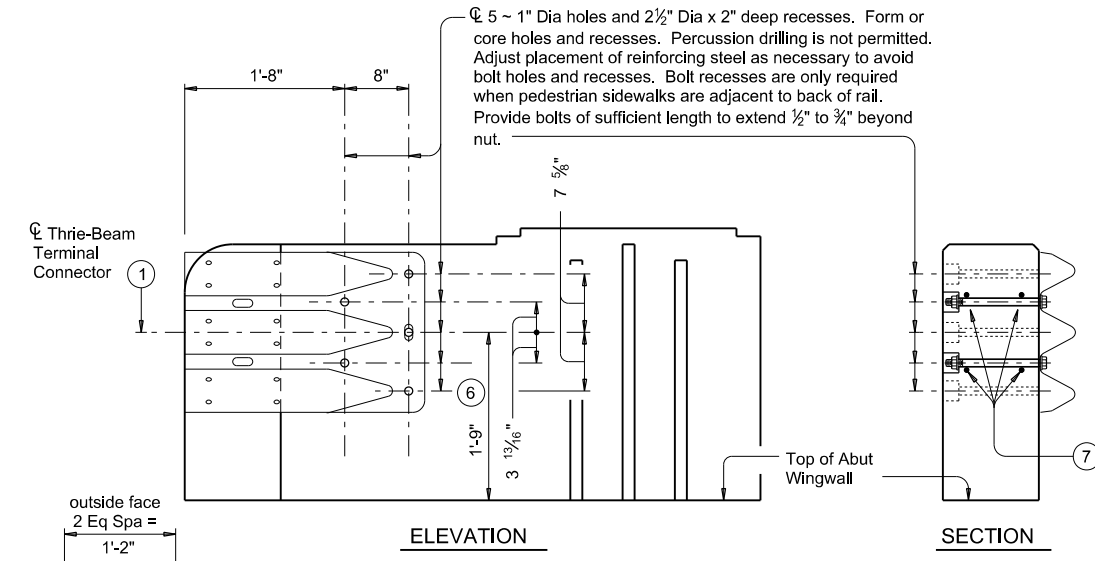


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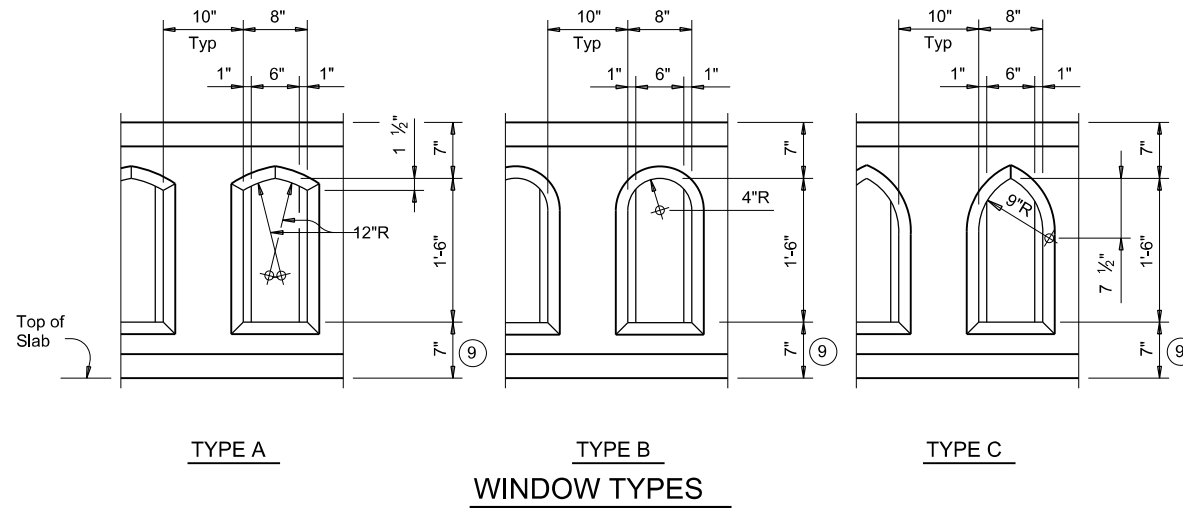
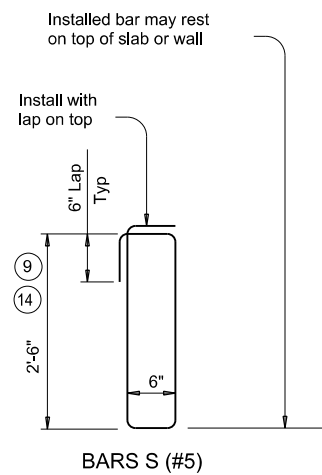
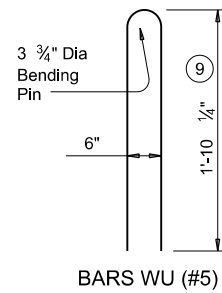


- ① Terminal Connectors and associated hardware are to be paid for under the Transition Items. Attach Transitions to the bridge unless otherwise shown in the plans.
- ② Number of windows in exterior bays are equal.
- ③ Space Span Pilasters at 1/2 span length (Approx).
- ④ Dimension is the same for all posts adjacent to Span Pilasters in a span. Dimension may vary from span to span. Min = 3", Max = 7 1/2".
- ⑤ Min = 6", Max = 1'-3".
- ⑥ Increase 2" for structures with overlay.
- ⑦ Place 4 additional Bars WH(#5) 3'-8" in length inside Bars S(#5) and centered 2'-0" from end of rail when Terminal Connections are required. Field bend as needed.



**ELEVATION SHOWING TYPICAL REINFORCING PLACEMENT**

The use of this railing is restricted to speeds of 45 mph or less.



**CONSTRUCTION NOTES:**  
 Face of rail and pilasters, parapet must be plumb unless otherwise approved.  
 Apply a one rub finish to all railing surfaces unless otherwise shown elsewhere on the plans.

**MATERIAL NOTES:**  
 Provide Class "S" concrete for railing.  
 Provide Grade 60 reinforcing steel.  
 Provide bar laps, where required, as follows:  
 Uncoated ~ #5 = 2'-0"  
 Uncoated ~ #7 = 2'-11"  
 Epoxy coated ~ #5 = 3'-0"  
 Epoxy coated ~ #7 = 4'-4"

**GENERAL NOTES:**  
 This rail has been evaluated and approved to be of equal strength to railing with like geometry, which have been crash tested to meet MASH TL-2 criteria. This rail can be used for speeds of 45 mph and less when a TL-2 or TL-3 rated guard fence transition is used. This rail is only approved for low speed use, speeds of 45 mph and less.

Rail anchorage details shown on this standard may require modification for select structure types. See appropriate details elsewhere in plans for these modifications.

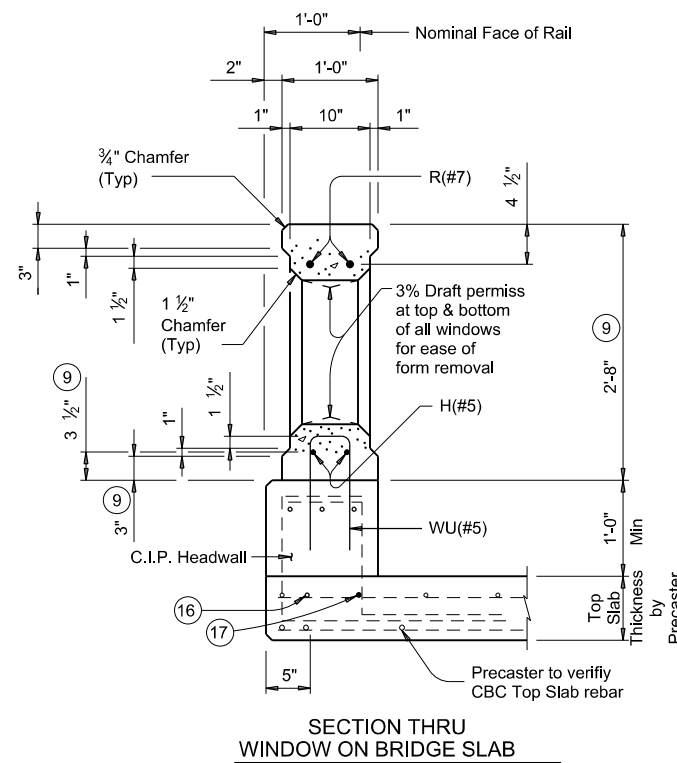
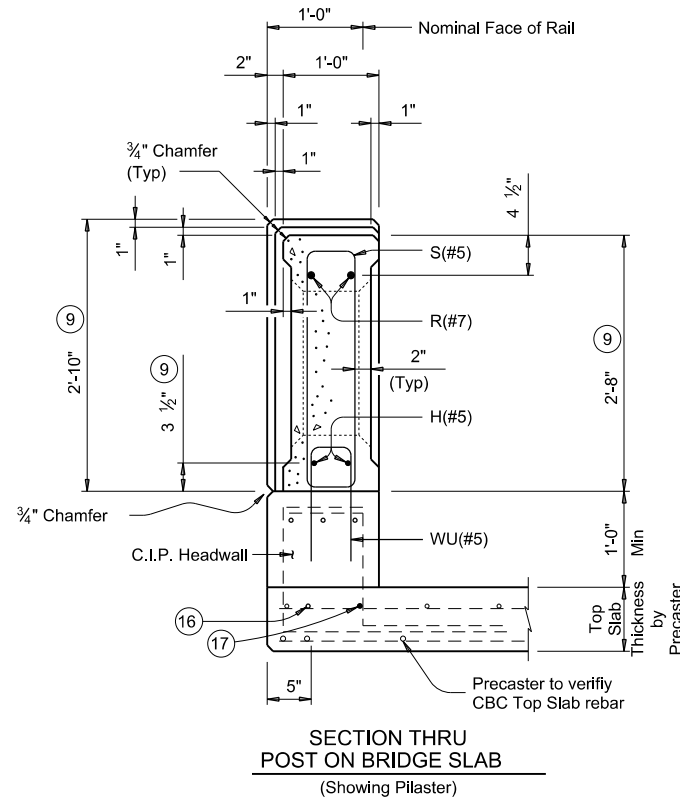
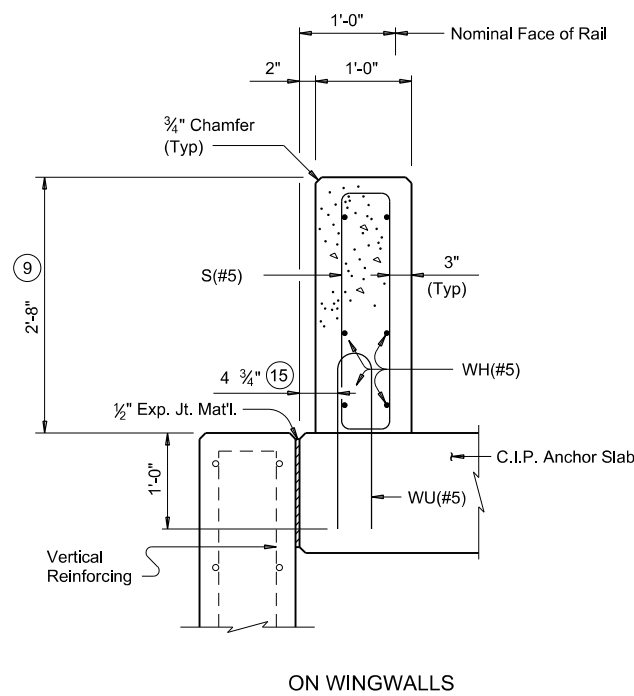
See Bridge Layout or other plan sheets for the following: dimensions with the number of span pilasters, dimensions with the number of windows, window type, inclusion of bronze stars, inclusion of construction year with abutment identity.

Submit erection drawings showing span number, span pilaster locations, number of windows between pilasters and spacing to first window to the Engineer for approval.

Average weight of railing with no overlay increase and no pilasters is 270 plf.

All rebar embedded in precast culvert shall be included in culvert bid item.  
 All rebar in rail and end transition, including dowels between headwall and rail/transition base, shall be included in bridge rail pay item.

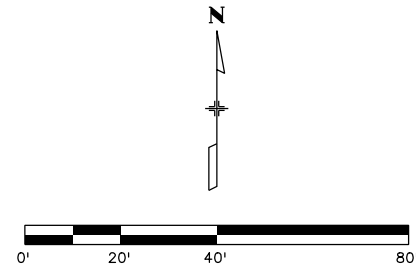
Cover dimensions are clear dimensions, unless noted otherwise.  
 Reinforcing bar dimensions shown are out-to-out of bar.



**SECTIONS THRU RAIL**

- 7 Provide rail joints at ends of all spans the same width as Slab joint opening, except that Rail Joints over construction joints must be 1/4" Min to 3/4" Max in width. Joints must be open if slab joint opening is not sealed. Joints over construction joints and over sealed deck joints must be plugged. Forming material used in joints may be left in place if it is light in color and compressible, such as the following materials: polystyrene, molded cork granules, sponge rubber sheet, etc. If forming material is not left in place, plug the bottom 6" with slab joint sealing compound to prevent drainage and staining.
- 9 Increase 2" for structures with overlay.
- 13 Dimensions must be the same on each side of joint.
- 14 Reduce by 2" or field bend over Preformed Bituminous Fiber Material to gain cover.
- 15 5 1/4" when vertical reinforcing has closer clear cover over horizontal reinforcing in abutment wingwalls or retaining walls on traffic side of wall.
- 16 As an aid in supporting reinforcement, additional longitudinal bars may be used in the slab with the approval of the Engineer. Such bars must be furnished at the Contractor's expense.
- 17 Top longitudinal slab bar may be adjusted laterally 3" plus or minus to tie reinforcing.

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EXISTING OVERHEAD ELECTRIC LINE (TO REMAIN IN PLACE DURING CONSTRUCTION). OVERHEAD LINE CLEARANCE IS SUFFICIENT TO CONSTRUCT PROJECT WITHOUT CONFLICT.

EXISTING TELECOM PEDESTAL (TO REMAIN IN PLACE)

EXISTING POWER POLE (TO REMAIN IN PLACE) (TYP.)

EXISTING TELEPHONE AND FIBER OPTIC LINES TO REMAIN IN PLACE DURING CONSTRUCTION. CONTRACTOR SHALL PROVIDE TEMPORARY SUPPORT, RELOCATION. CONTRACTOR SHALL ACCOMMODATE UTILITY OWNER FLOW FILL ENCASEMENT AFTER RELOCATION.

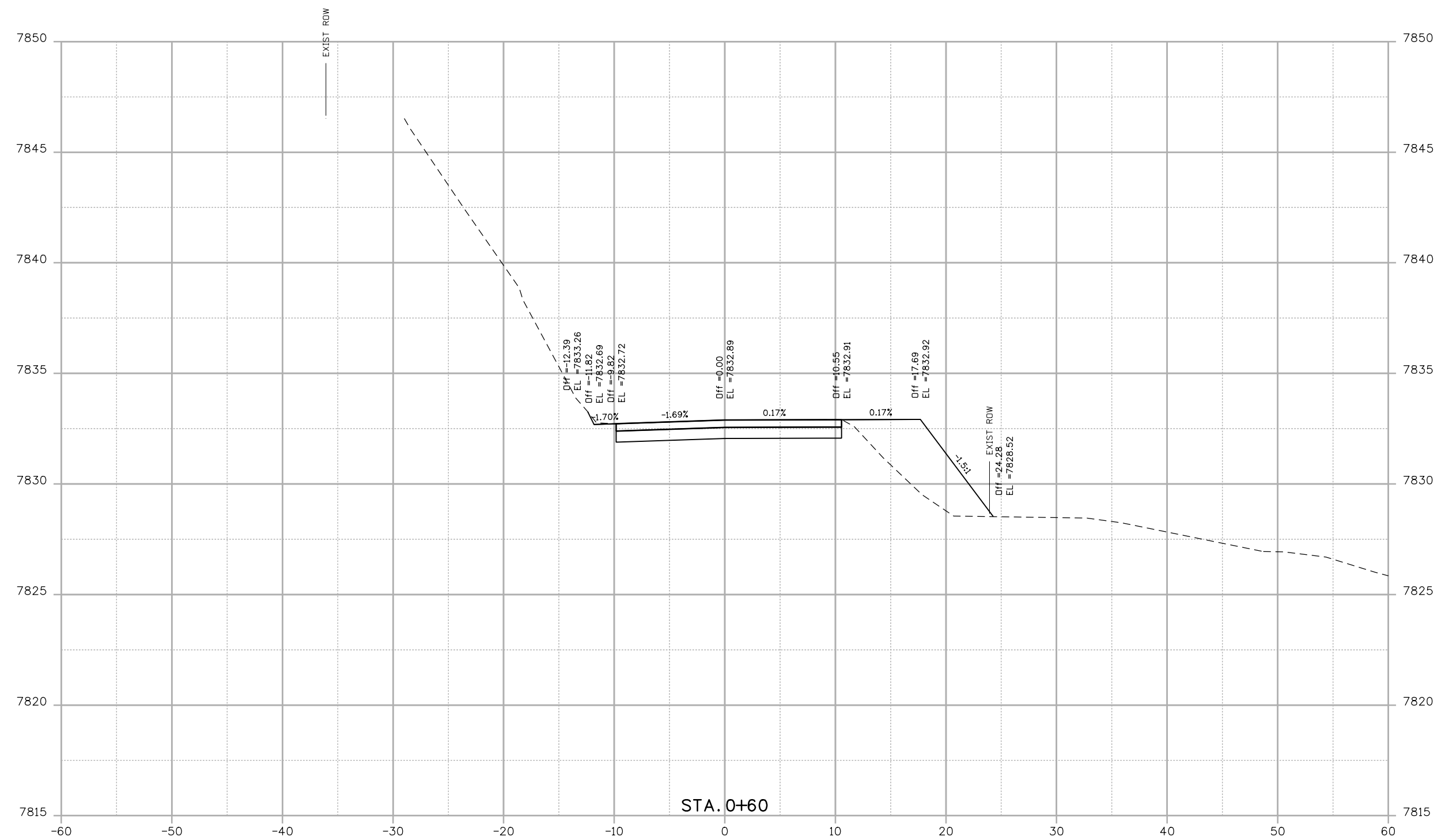
LEGEND	
	EXISTING R.O.W.
	EXISTING LOT/PROPERTY LINE
	EXISTING UTILITY EASEMENT
	EXISTING OVERHEAD ELECTRIC LINE
	EXISTING BURIED TELEPHONE LINE
	EXISTING BURIED FIBER OPTIC LINE

FOR UTILITY OWNER INFORMATION, SEE SUE PLANS.

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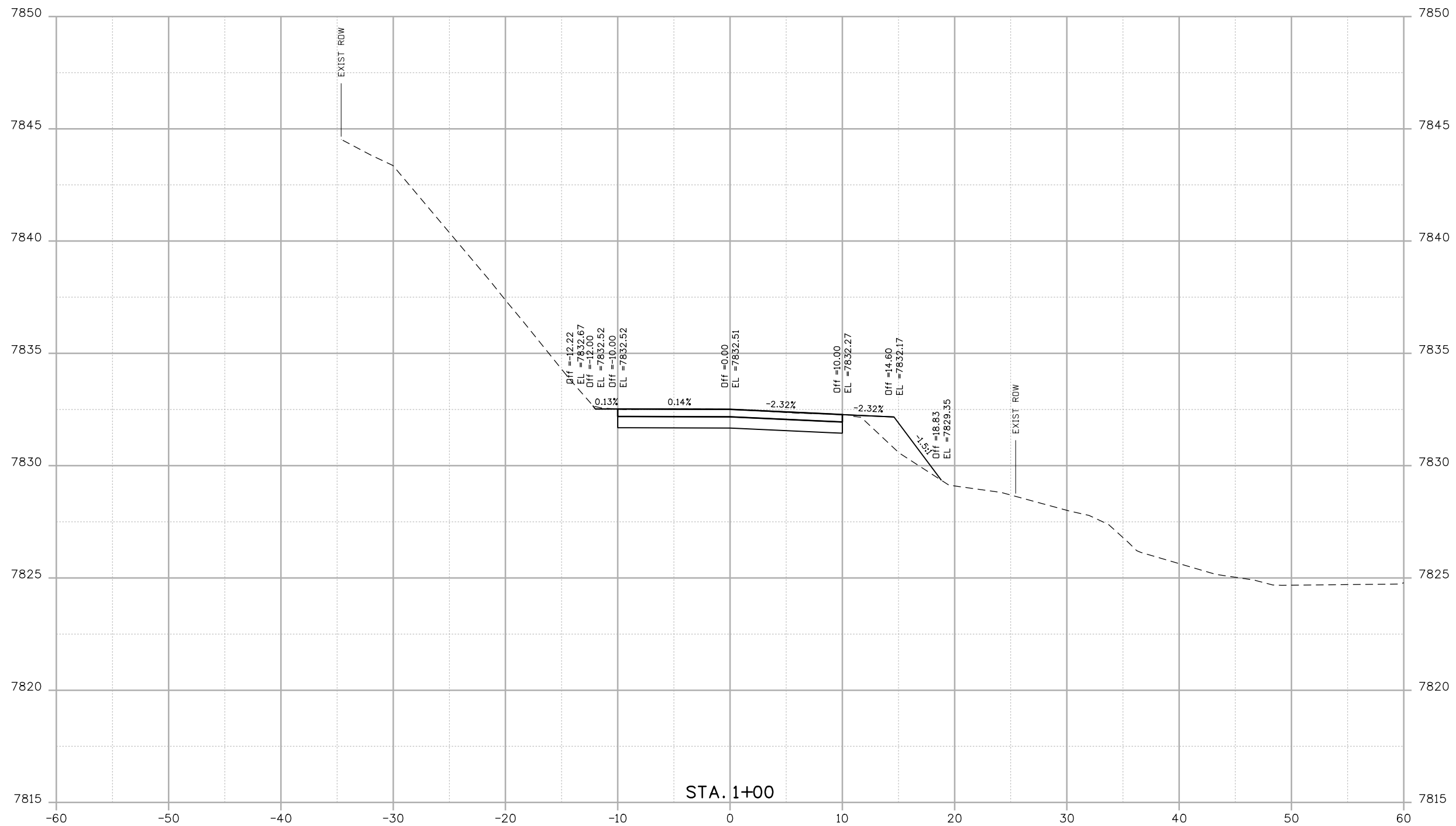
<b>FINAL</b>	<p>CALL UTILITY NOTIFICATION CENTER OF COLORADO CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES</p>	<p>REVISIONS:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 5%;">NO.</th> <th style="width: 10%;">DATE</th> <th style="width: 85%;">REVISION DESCRIPTION:</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>	NO.	DATE	REVISION DESCRIPTION:										<p><b>BOULDER COUNTY PUBLIC WORKS ENGINEERING DIVISION</b></p>	<p>RIVERSIDE DR. STRUCTURE REPLACEMENT</p> <p><b>UTILITY PLAN</b></p>
			NO.	DATE	REVISION DESCRIPTION:											
<p>DESIGNED: SEK CAD/C3D: DWS CHECKED: SEK DATE: 7/7/2023</p>	<p>PROJECT NO: <b>BC-103-009</b> SHEET NO: <b>36</b></p>															

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<b>FINAL</b>	 <small>CALL UTILITY NOTIFICATION CENTER OF COLORADO CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES</small>	<b>REVISIONS:</b>	<b>NO.</b>	<b>DATE</b>	<b>REVISION DESCRIPTION:</b>	 <b>BOULDER COUNTY PUBLIC WORKS ENGINEERING DIVISION</b>	<small>RIVERSIDE DR. STRUCTURE REPLACEMENT</small> <b>ROADWAY CROSS SECTIONS</b>	
		DESIGNED:	CAD/C3D:	CHECKED:	DATE:		PROJECT NO:	SHEET NO:
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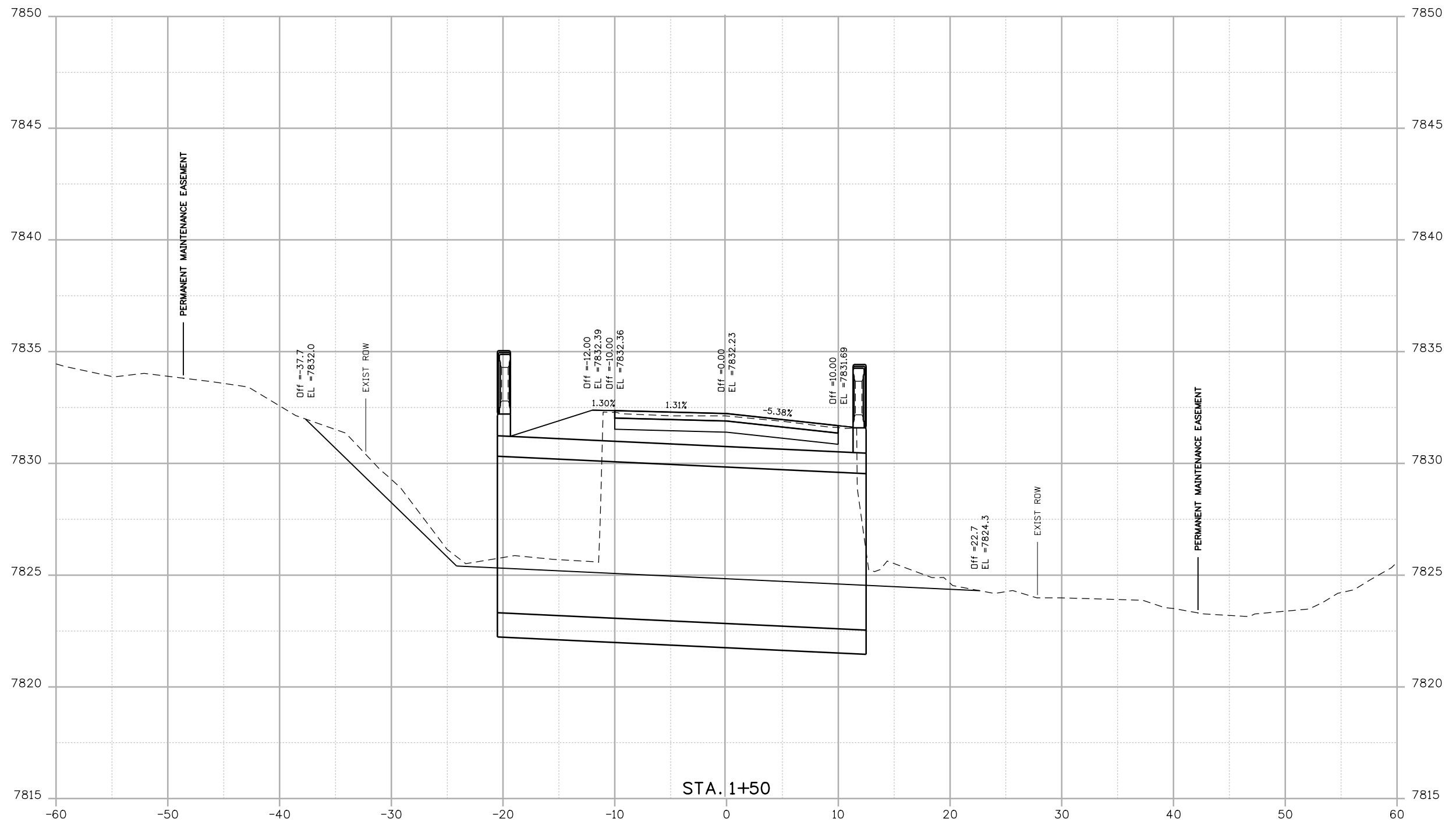
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<b>FINAL</b>	 <small>CALL UTILITY NOTIFICATION CENTER OF COLORADO CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES</small>	<b>REVISIONS:</b>	<b>NO.</b>	<b>DATE</b>	<b>REVISION DESCRIPTION:</b>	 <b>BOULDER COUNTY PUBLIC WORKS ENGINEERING DIVISION</b>	<b>RIVERSIDE DR. STRUCTURE REPLACEMENT</b>		
							<small>DESIGNED: CAD/C3D: CHECKED: DATE:</small> SEK DWS SEK 9-27-2022	<b>ROADWAY CROSS SECTIONS</b>	
						<small>PROJECT NO:</small> <b>BC-103-009</b>	<small>SHEET NO:</small> <b>38</b>		

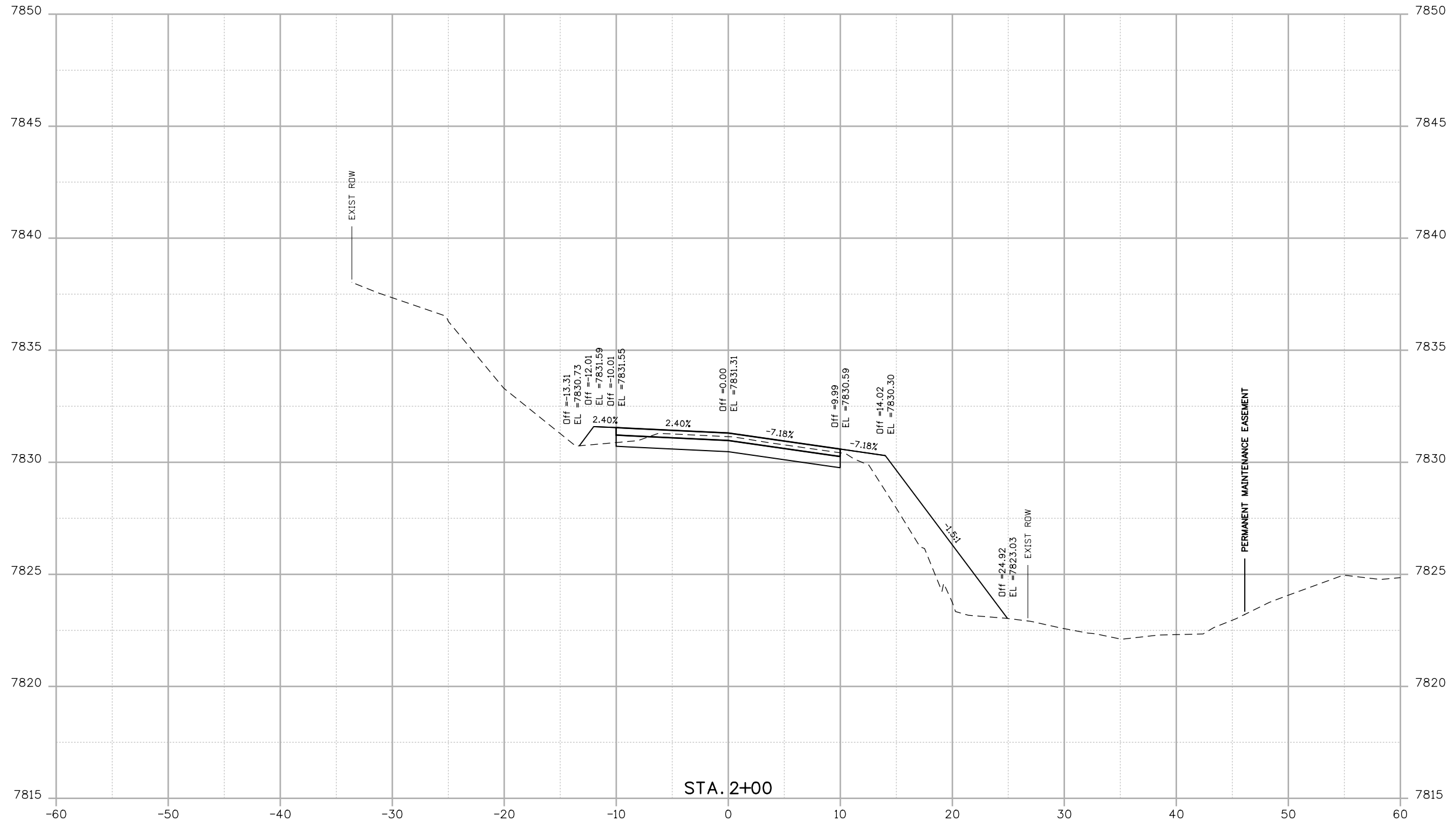
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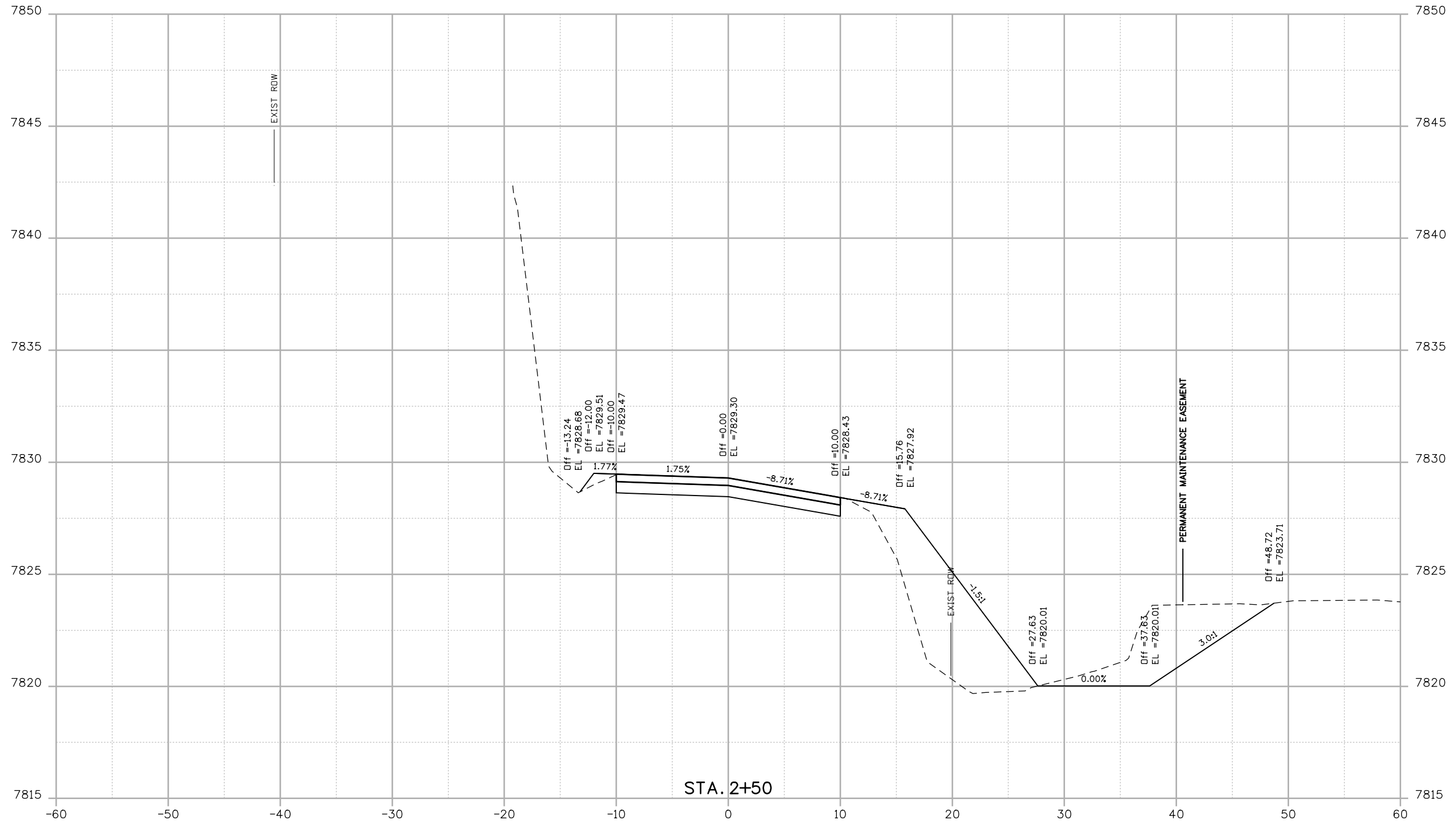


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<b>FINAL</b>	 <small>CALL UTILITY NOTIFICATION CENTER OF COLORADO CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES</small>	<b>REVISIONS:</b>	<b>NO.</b>	<b>DATE</b>	<b>REVISION DESCRIPTION:</b>	 <b>BOULDER COUNTY PUBLIC WORKS ENGINEERING DIVISION</b>	<small>RIVERSIDE DR. STRUCTURE REPLACEMENT</small> <b>ROADWAY CROSS SECTIONS</b>			<small>PROJECT NO: <b>BC-103-009</b> SHEET NO: <b>40</b></small>
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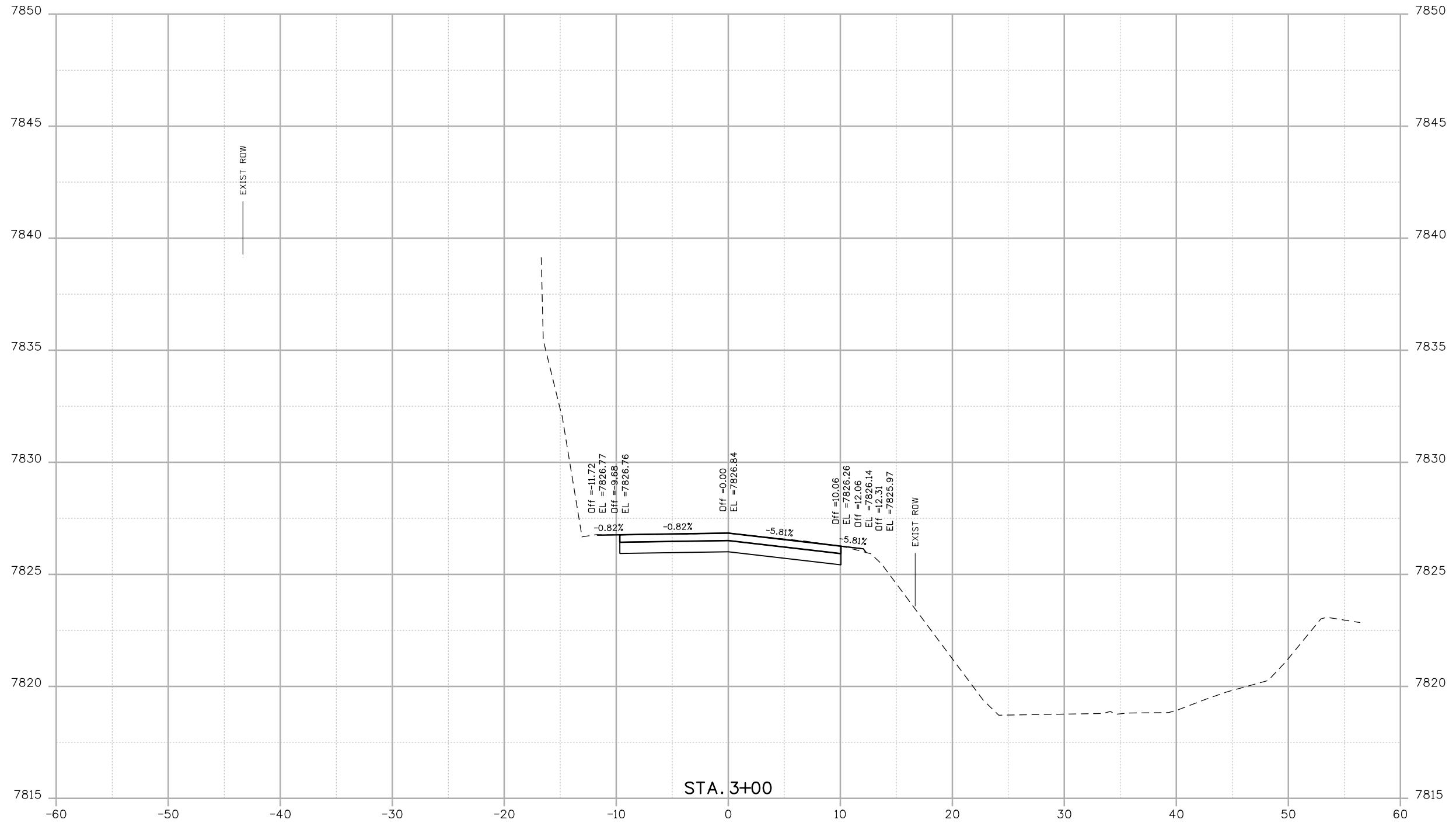
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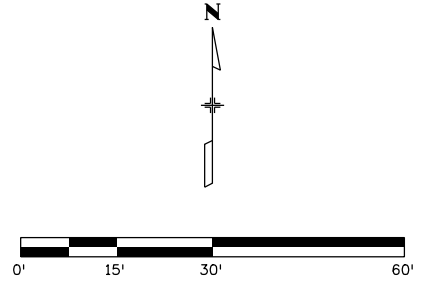
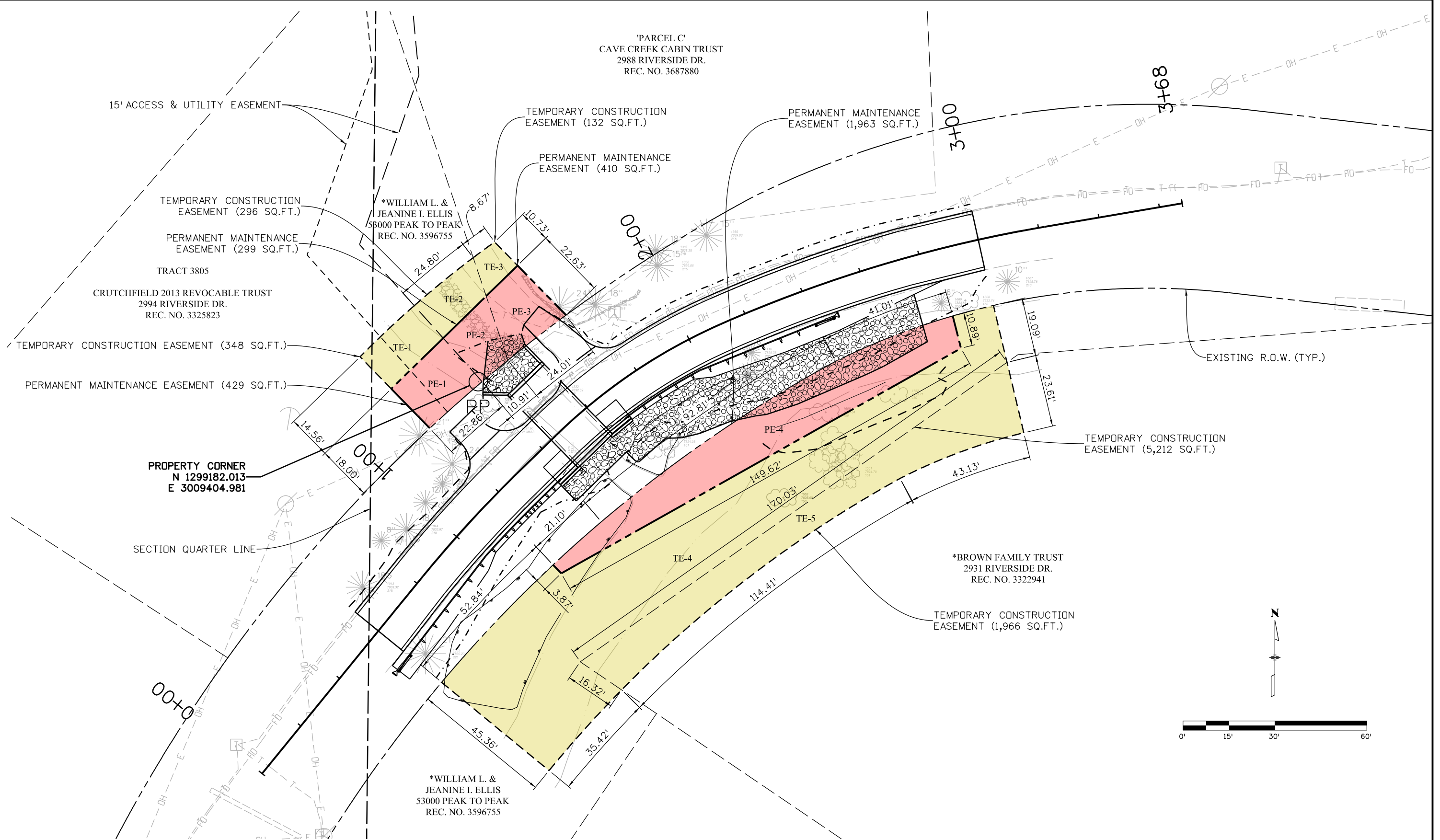
<b>FINAL</b>	 <small>CALL UTILITY NOTIFICATION CENTER OF COLORADO CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES</small>	<b>REVISIONS:</b>	<b>NO.</b>	<b>DATE</b>	<b>REVISION DESCRIPTION:</b>	 <b>BOULDER COUNTY PUBLIC WORKS ENGINEERING DIVISION</b>	<small>RIVERSIDE DR. STRUCTURE REPLACEMENT</small> <b>ROADWAY CROSS SECTIONS</b>	
		DESIGNED:	CAD/C3D:	CHECKED:	DATE:		PROJECT NO:	SHEET NO:
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<b>FINAL</b>	 <small>CALL UTILITY NOTIFICATION CENTER OF COLORADO</small> <small>CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES</small>	<small>REVISIONS:</small>	<small>NO.</small>	<small>DATE</small>	<small>REVISION DESCRIPTION:</small>	 <b>BOULDER COUNTY PUBLIC WORKS</b> <b>ENGINEERING DIVISION</b>	<small>RIVERSIDE DR. STRUCTURE REPLACEMENT</small>		
							<small>DESIGNED:</small> SEK <small>CAD/C3D:</small> DWS <small>CHECKED:</small> SEK <small>DATE:</small> 9-27-2022	<b>ROADWAY CROSS SECTIONS</b>	
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<b>FINAL</b>	<p>CALL UTILITY NOTIFICATION CENTER OF COLORADO CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES</p>	NO.	DATE	REVISION DESCRIPTION:	<p><b>BOULDER COUNTY PUBLIC WORKS ENGINEERING DIVISION</b></p>	DESIGNED: SEK CAD/C3D: DWS CHECKED: SEK DATE: 7/7/2023		RIVERSIDE DR. STRUCTURE REPLACEMENT	
						PROJECT NO: <b>BC-103-009</b>		SHEET NO: <b>43</b>	



**Boulder County Purchasing**  
**1325 Pearl Street**  
**Boulder, CO 80302**  
[purchasing@bouldercounty.gov](mailto:purchasing@bouldercounty.gov)

## **INSURANCE AND W-9 REQUIREMENTS**

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### **PAYMENT & PERFORMANCE BONDS**

**Both a payment and a performance bond are required for this project and must each equal 100% of the proposed cost. Please include the cost of this bonding into the total proposed cost.**

### **INSURANCE REQUIREMENTS**

#### **i. Commercial General Liability**

This coverage should be provided on an Occurrence Form, ISO CG001 or equivalent, with Minimum limits of \$1,000,000 Each Occurrence, \$2,000,000 General Aggregate and \$2,000,000 Products Completed Operations Aggregate.

#### **ii. Automobile Liability**

Bodily Injury and Property Damage for any owned, hired, and non-owned vehicles used in the performance of the Contract. Minimum limits \$1,000,000 Each Accident.

#### **iii. Workers' Compensation and Employer's Liability**

Workers' Compensation must be maintained with the statutory limits. Employer's Liability is required for minimum limits of \$100,000 Each Accident/\$500,000 Disease-Policy Limit/\$100,000 Disease-Each Employee.

#### **iv. Umbrella / Excess Insurance**

Umbrella/Excess Liability insurance in the amount \$3,000,000.00, following form.

#### **v. Pollution Liability**

Coverage pay for those sums the Contractor becomes legally obligated to pay as damages because of Bodily Injury, Property Damage or environmental Damage arising out of a pollution incident caused by the Contractor's work including Completed Operations. Coverage shall include emergency response expenses, pollution liability during transportation (if applicable) and at Non-Owned Waste Disposal Site (if applicable). The Minimum limits required are \$1,000,000 Per Occurrence/Loss and \$1,000,000 Policy Aggregate. If the coverage is written on a claims-made basis, the Contractor warrants that any retroactive date applicable to coverage under the policy precedes the effective date of this Contract; and that continuous coverage will be maintained or an extended discovery

period will be exercised for a period of three (3) years beginning from the time that work under this contract is completed. County shall be named as an additional insured for ongoing operations and completed operations.

**Additional Insured: Boulder County shall be named as an additional insured for General Liability, Umbrella/Excess Liability, and Pollution Liability, as designated in this Contract. Additional insured shall be endorsed to the policy.**

**THE ADDITIONAL INSURED WORDING SHOULD BE AS FOLLOWS: County of Boulder, State of Colorado, a body corporate and politic, is named as Additional Insureds.**

**In regards to General Liability, Umbrella/Excess Liability, and Pollution Liability:  
If any or all of these coverages are required above, additional insured status will be required at the time a contract is executed.**

**Note that the above insurance amounts are the minimum required for this project. Proof of current insurance must be provided with your proposal in the form of a sample certificate. You are NOT required to include additional insured status until the time a contract is executed.**

**If you require a waiver of insurance requirements you may request one in your response with an explanation.**

#### **W-9 REQUIREMENT**

Provide a copy of your business's W-9 with your proposal.



**Boulder County Purchasing**  
**1325 Pearl Street**  
**Boulder, CO 80302**  
[purchasing@bouldercounty.gov](mailto:purchasing@bouldercounty.gov)

**SUBMITTAL SECTION**

The bidder’s attention is especially called to the items listed below, which must be submitted in full as part of the BID. Failure to submit any of the documents listed below as a part of your BID, or failure to acknowledge any addendum in writing with your BID, or submitting a bid on any condition, limitation or provision not officially invited in this Invitation to Bid (BID) may be cause for rejection of the BID.

**THIS CHECKLIST MUST BE SUBMITTED AS PART OF YOUR BID PACKAGE:** Bidder will check each box indicating compliance:

INCLUDED	ITEM
	Name and Address of the Partners and Subcontractors if applicable
	A detailed project schedule with an all-inclusive total cost
	Information on the relevant experience of key personnel
	State your compliance with the Terms and Conditions in the Sample Contract contained in this BID. Specifically list any deviations and provide justification for each deviation.
	Submit three references for similar projects your company has completed within the last three years and contact information. Boulder County will review all contractor evaluation forms from previous County projects.
	Insurance Certificate
	W-9
	Signature Page
	Addendum Acknowledgement(s) (If Applicable)

**THIS QUESTION MUST BE ANSWERED AS PART OF YOUR BID PACKAGE:** Bidder will answer Yes or No indicating compliance:

<b>YES OR NO</b>	<b>ITEM</b>
	Do you customarily keep line-item pricing information, such as the information being submitted with this proposal, confidential or closely-held?





**Boulder County Purchasing**  
**1325 Pearl Street**  
**Boulder, CO 80302**  
[purchasing@bouldercounty.gov](mailto:purchasing@bouldercounty.gov)

**BID TAB**

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**See Excel Spread Sheet included with the Advertisement.**



**Boulder County Purchasing**  
**1325 Pearl Street**  
**Boulder, CO 80302**  
[purchasing@bouldercounty.gov](mailto:purchasing@bouldercounty.gov)

**SIGNATURE PAGE**

Contact Information	Response
Company Name including DBA	
List Type of Organization (Corporation, Partnership, etc.)	
Name, Title, and Email Address of Person Authorized to Contract with Boulder County	
Company Address	
Company Phone Number	
Company Website	

**By signing below I certify that:**

- I am authorized to bid on my company’s behalf.
- I am not currently an employee of Boulder County.
- None of my employees or agents is currently an employee of Boulder County.
- I am not related to any Boulder County employee or Elected Official.
- (Sole Proprietorships Only) I am not a Public Employees’ Retirement Association (PERA) retiree.

\_\_\_\_\_  
**Signature of Person Authorized to Bid on  
 Company’s Behalf**

\_\_\_\_\_  
**Date**

Note: If you cannot certify the above statements, please explain in a statement of explanation.

## Contract

DETAILS SUMMARY	
<b>Document Type</b>	Choose an item.
OFS Number-Version	
<b>County Contact Information</b>	
Boulder County Legal Entity	Choose an item.
Department	
Division/Program	
Mailing Address	
Contract Contact – <i>Name, email</i>	
Invoice Contact – <i>Name, email</i>	
<b>Contractor Contact Information</b>	
Contractor Name	
Contractor Mailing Address	
Contact 1- <i>Name, title, email</i>	
Contact 2- <i>Name, title, email</i>	
<b>Contract Term</b>	
Start Date	
Expiration Date	
Final End Date	
<b>Contract Amount</b>	
Contract Amount	
Fixed Price or Not-to-Exceed?	Choose an item.
<b>Brief Description of Work</b>	
<b>Contract Documents</b>	
a. Formal Procurement (RFP/Bid/SOQ) No. Bid Variable (the "Bid Documents") b. Contractor's proposal in response to the Bid Documents (the "Proposal") c. Project Details, including project-specific terms and a Scope of Work, attached as Exhibit A (the "Scope of Work") d. Fee Schedule, attached as Exhibit B (the "Fee Schedule")	
<b>Purchasing Details – <i>County Internal Use Only</i></b>	
Grant Funded?	Yes or No
Bid Number	
Award Date	
If no Bid No., bid process used	Choose an item.
COVID-19	YES or NO
Project #	
Purchasing Notes <i>(optional)</i>	
<b>Contract Notes</b>	
<i>Additional information not included above</i>	

THIS CONTRACT ("Contract") is entered into by and between the Board of County Commissioners on behalf of the County of Boulder, State of Colorado, a body corporate and politic, for the benefit of the [Department] ("County") and [Supplier] ("Contractor"). County and Contractor are each a "Party," and collectively the "Parties."

In consideration of the mutual covenants contained in this Contract, the receipt and sufficiency of which is hereby acknowledged, the Parties agree as follows:

1. **Incorporation into Contract:** The **Details Summary** is incorporated into this Contract. The **Contract Documents** are incorporated into this Contract by reference, except to the extent that the Proposal, if any is incorporated, contains any obligations placed upon County and not otherwise contained in this Contract.

2. **Work to be Performed:** Contractor will provide all labor and equipment and do all tasks necessary and incidental to performing the work as described in the **Details Summary** and **Contract Documents** (the "Work"). Contractor will perform the Work (i) in a good and workmanlike manner, (ii) at its own cost and expense, (iii) in accordance with recognized industry standards of care, skill and diligence for the type of work being performed, and (iv) in strict accordance with the Contract. County and its representatives shall have access to the Work at all times.

a. Contractor shall supervise and direct the Work and shall be solely responsible for all construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract.

b. Contractor shall provide and pay for all labor, materials, equipment, tools, construction equipment and machinery, transportation, and other facilities and services necessary for the proper execution and completion of the Work. Contractor warrants that all materials incorporated into the Work will be new unless otherwise specified.

c. Contractor shall at all times enforce good order among its employees and shall not employ on the Work any unfit person or anyone not skilled in the task assigned to such person. Contractor shall initiate, maintain, and supervise all safety precautions and programs in connection with the Work to ensure safe conditions on the premises at all times. Contractor shall comply with all laws, regulations, ordinances, rules, and orders of any public authority bearing on the safety of persons and property. In the event that County notifies Contractor of any unsafe conditions or practices, Contractor shall immediately take all actions required to remediate them at no expense to County. County reserves the right to immediately suspend the Work in the event of imminent hazard, as determined by County.

d. At all times, Contractor shall keep the premises free from accumulation of waste materials or rubbish caused by Contractor's operations. Upon completion of the Work, Contractor shall remove all of its waste materials and rubbish from the premises, as well as its tools, construction equipment, machinery and surplus materials.

e. Contractor shall confine operations on the premises to areas permitted by law, ordinances, permits, this Contract, and as directed by County, including storage of any materials or equipment.

f. Any claim for an increase in the **Contract Amount** shall be made and generally described by Contractor in writing and delivered to County promptly, in no event later than thirty (30) days after the occurrence of the event giving rise to the claim. Notice of the amount of the claim with supporting data shall be delivered to County within sixty (60) days after such occurrence and shall be accompanied by Contractor's written statement that the amount claimed covers all known amounts to which Contractor is entitled as a result of the occurrence of said event. All claims for increase in the **Contract Amount** shall be determined by County if the Parties are unable to otherwise reach agreement on the claim.

g. Before ordering any materials or doing any Work, Contractor shall verify all measurements for the Work and shall be responsible for the correctness of same.

3. Term of Contract: The **Contract Term** begins on the **Start Date** and expires on the **Expiration Date**, unless terminated sooner. All the Work must be performed during the **Contract Term**.
4. Payment for Work Performed: In consideration of the Work performed by Contractor, and subject to conditions contained in this Contract, County will pay an amount not to exceed the **Contract Amount** to Contractor in accordance with the **Contract Documents**.
5. Invoicing: Contractor will promptly provide a copy of its Form W-9 and invoice template to County upon request. Contractor must submit an invoice to the County by the fifteenth (15th) day of the month for completion of any Work performed in the prior calendar month. All invoices submitted require the following components: Contractor's name and address (submitted W-9 address must match remit address), detailed description of services, dates of services, itemization of labor and materials costs, "Bill to: Boulder County" language, payment remittance address, payer, name and address, date of invoice, unique invoice number, and total amount due. Contractor must send all completed invoices to the **Invoice Contact** in the **Details Summary**. County may require delivery of invoices by email. Failure to submit invoices in a timely manner and in accordance with the terms of this Contract may cause a delay in payment. County may recoup any damages incurred because of Contractor's failure to submit invoices pursuant to the terms of this paragraph. County's acceptance or payment of an invoice will not constitute acceptance of any Work performed under this Contract.
6. Extra Time to Complete the Work (Additional Time only): If Contractor cannot complete the Work by the **Expiration Date**, Contractor may request extra time to complete the Work. County, in its sole discretion, may grant Contractor additional time to complete the Work by sending a written notice of extension to Contractor. An extension of time to complete the Work will not entitle Contractor to additional compensation from County.
7. Extension of Contract Term (Additional Time and Work): Upon mutual agreement of the Parties, this Contract may be extended until the **Final End Date**. During any extended **Contract Term**, the terms of this Contract will remain in full force and effect, unless otherwise amended in writing by the Parties. Where the Contractor will provide additional services for additional compensation beyond the initial **Contract Amount**, the Parties must execute a written amendment before the then-current **Expiration Date**. If necessary, the written amendment will incorporate an updated Scope of Work and updated Fee Schedule as exhibits. Contractor must provide a current Certificate of Insurance to the County that complies with the **Insurance Requirements** of this Contract, if any, prior to any extended **Contract Term**.
8. Schedule of Work: County may designate the hours (on a daily or weekly basis) during which Contractor may perform the Work, strictly for the purposes of minimizing inconvenience to the County and interference with County operations. Contractor will otherwise set its own work schedule. Contractor shall promptly notify County of any aspect of the Work that will not be delivered or accomplished according to the initial schedule.
9. Indemnity: Contractor will be liable for any damages to persons or property caused by or arising out of the actions, obligations, or omissions of Contractor, its employees, agents, representatives or other persons acting under Contractor's direction or control in performing or failing to perform the Work under this Contract. Contractor will indemnify and hold harmless County, its elected officials and appointed department heads, and its employees, agents and representatives (the "indemnified parties"), from any and all liability, claims, demands, actions, damages, losses, judgments, costs or expenses, including attorneys' fees, which may be made or brought or which may result against any of the indemnified parties as a result or on account of the actions or omissions of Contractor, its employees, agents or representatives, or other persons acting under Contractor's direction or control. This indemnification obligation will extend to claims based on Contractor's unauthorized use or disclosure of confidential information and intellectual property infringement. County will not be obligated to indemnify or defend Contractor under any circumstances. Contractor's obligations under this provision shall survive expiration or termination of this Contract. Nothing contained in this Contract or the **Contract Documents** is intended to limit or restrict the indemnification

rights or obligations of any Party under this provision, or damages available for breaches of the obligations herein.

10. Nondiscrimination: Contractor will comply with the Colorado Anti-Discrimination Act, C.R.S. § 24-34-401, et seq., as amended, and all applicable local, State and Federal laws concerning discrimination and unfair employment practices. County prohibits unlawful discrimination on the basis of race, color, religion, gender, gender identity, national origin, age 40 and over, disability, socio-economic status, sexual orientation, genetic information, or any other status protected by applicable Federal, State or local law. Contractor must require that its subcontractors, if any, similarly comply with all applicable laws concerning discrimination and unfair employment practices.

11. Information and Reports: Contractor will provide to authorized County, State, and Federal government representatives all information and reports that may be required for any purpose authorized by law. Contractor will permit access to such representatives to Contractor's facilities, books, records, accounts, and any other relevant sources of information. Where information required by a representative is in the exclusive possession of a person or entity other than Contractor, Contractor must so certify to the County and explain what efforts it has made to obtain the information.

12. Independent Contractor: **Contractor is an independent contractor for all purposes in performing the Work. None of Contractor, its agents, personnel or subcontractors are employees of the County for any purpose, including the Federal Insurance Contribution Act, the Social Security Act, the Federal Unemployment Tax Act, the provisions of the Internal Revenue Code, the Colorado Workers' Compensation Act, the Colorado Unemployment Insurance Act, and the Public Employees Retirement Association. Accordingly, County will not withhold or pay any income tax, payroll tax, or retirement contribution of any kind on behalf of Contractor or Contractor's employees. As an independent contractor, Contractor is responsible for employing and directing such personnel and agents as it requires to perform the Work. Contractor will exercise complete authority over its personnel and agents and will be fully responsible for their actions.**

13. Termination

a. Breach: Either Party's failure to perform any of its material obligations under this Contract, in whole or in part or in a timely or satisfactory manner, will be a breach. The institution of proceedings under any bankruptcy, insolvency, reorganization or similar law, by or against Contractor, or the appointment of a receiver or similar officer for Contractor or any of its property, which is not vacated or fully stayed within thirty (30) days after the institution of such proceeding, will also constitute a breach. In the event of a breach, the non-breaching Party may provide written notice of the breach to the other Party. If the breaching Party does not cure the breach, at its sole expense, as reasonably determined by the non-breaching Party in its sole discretion, within thirty (30) days after delivery of notice, the non-breaching Party may exercise any of its remedies provided under this Contract or at law, including immediate termination of this Contract.

b. Non-Appropriation: The other provisions of this Contract notwithstanding, County is prohibited by law from making commitments beyond the current fiscal year. Payment to Contractor beyond the current fiscal year is contingent on the appropriation and continuing availability of funding in any subsequent year. County has reason to believe that sufficient funds will be available for the full **Contract Term**. Where, however, funds are not allocated for any fiscal period beyond the current fiscal year, County may terminate this Contract without penalty by providing seven (7) days' written notice to Contractor.

c. Convenience: In addition to any other right to terminate under this Section 13, County may terminate this Contract, in whole or in part, for any or no reason, upon seven (7) days' advance written notice to Contractor.

14. Contractor Obligations upon Termination or Expiration: By the **Expiration Date** or effective date of termination, if earlier, Contractor must (1) remove from County property all of its personnel, equipment,

supplies, trash and any hazards created by Contractor, (2) protect any serviceable materials belonging to the County, and (3) take any other action necessary to leave a safe and healthful worksite. Any items remaining on County property after the Expiration Date or the effective date of termination, if earlier, will be deemed abandoned by Contractor.

15. Payable Costs in Event of Early Termination: If County terminates this Contract before the **Expiration Date**, Contractor's payments (and any damages associated with any lawsuit brought by Contractor) are limited to only (1) payment for Work satisfactorily executed and fully and finally completed, as determined by County in its sole discretion, prior to delivery of the notice to terminate, and (2) the reasonable and actual costs Contractor incurred in connection with performing the Work prior to delivery of the notice to terminate. Contractor explicitly waives all claims it may have against the County for any other compensation, such as anticipatory profits or any other consequential, special, incidental, punitive or indirect damages.

16. Remedies for Non-Performance: If Contractor fails to perform any of its obligations under this Contract, County may, at its sole discretion, exercise one or more of the following remedies (in addition to any other remedies provided by law or in this Contract), which shall survive expiration or termination of this Contract:

a. Suspend Performance: County may require that Contractor suspend performance of all or any portion of the Work pending necessary corrective action specified by the County and without entitling Contractor to an increase in compensation or extension of the performance schedule. Contractor must promptly stop performance and incurring costs upon delivery of a notice of suspension by the County.

b. Withhold Payment Pending Corrections: County may permit Contractor to correct any rejected Work at the County's discretion. Upon County's request, Contractor must correct rejected work at Contractor's sole expense within the time frame established by the County. Upon full and final completion of the corrections satisfactory to the County, County will remit payment to Contractor.

c. Deny Payment: County may deny payment for any Work that does not comply with the requirements of the Contract or that Contractor otherwise fails to provide or fully and finally complete, as determined by the County in its sole discretion. Upon County request, Contractor will promptly refund any amounts prepaid by the County with respect to such non-compliant Work.

d. Removal: Upon County's request, Contractor will remove any of its employees or agents from performance of the Work, if County, in its sole discretion, deems any such person to be incompetent, careless, unsuitable, or otherwise unacceptable.

17. Binding Arbitration Prohibited: County does not agree to binding arbitration by any extra-judicial body or person.

18. Conflicts of Interest: Contractor may not engage in any business or personal activities or practices or maintain any relationships that conflict in any way with the full performance of Contractor's obligations.

19. Notices: All notices provided under this Contract must be in writing and sent by Certified U.S. Mail (Return Receipt Requested), electronic mail, or hand-delivery to the other Party's **Contact** at the address specified in the **Details Summary**. For certified mailings, notice periods will begin to run on the day after the postmarked date of mailing. For electronic mail or hand-delivery, notice periods will begin to run on the date of delivery.

20. Statutory Requirements: This Contract is subject to all statutory requirements that are or may become applicable to counties or political subdivisions of the State of Colorado generally, including but not limited to: C.R.S. § 38-26-107, which requires withholding funds where the County receives a claim for payment from a supplier or subcontractor of Contractor upon notice of final settlement (required for public

works contracts that exceed \$150,000); C.R.S. § 8-17-101 et seq.; C.R.S. § 18-8-301, et seq.; and C.R.S. § 18-8-401, et seq.

21. Legal Interpretation. Each Party recognizes that this Contract is legally binding and acknowledges that it has had the opportunity to consult with legal counsel of its choice about this Contract. The rule of construction providing that any ambiguities are resolved against the drafting Party will not apply in interpreting the terms of this Contract.

22. Entire Agreement/Binding Effect/Amendments: This Contract represents the complete agreement between the Parties and is fully binding upon them and their successors, heirs, and assigns, if any. This Contract terminates any prior agreements, whether written or oral in whole or in part, between the Parties relating to the Work. This Contract may be amended only by a written agreement signed by both Parties.

23. Assignment/Subcontractors: This Contract may not be assigned or subcontracted by Contractor without the prior written consent of the County. If Contractor subcontracts any of its obligations under this Contract, Contractor will remain liable to the County for those obligations and will also be responsible for subcontractor's performance under, and compliance with, this Contract. Contractor shall not contract with a person or entity to whom County has made a reasonable objection.

24. Governing Law/Venue: The laws of the State of Colorado govern the construction, interpretation, performance, and enforcement of this Contract. Any claim relating to this Contract or breach thereof may only be brought exclusively in the Courts of the 20<sup>th</sup> Judicial District of the State of Colorado and the applicable Colorado Appellate Courts.

25. Breach: The failure of either Party to exercise any of its rights under this Contract will not be deemed to be a waiver of such rights or a waiver of any breach of the Contract. All remedies available to a Party in this Contract are cumulative and in addition to every other remedy provided by law.

26. Severability: If any provision of this Contract becomes inoperable for any reason but the fundamental terms and conditions continue to be legal and enforceable, then the remainder of the Contract will continue to be operative and binding on the Parties.

27. Third-Party Beneficiary: Enforcement of the terms and conditions and all rights and obligations of this Contract are reserved to the Parties. Any other person receiving services or benefits under this Contract is an incidental beneficiary only and has no rights under this Contract. Notwithstanding, where the beneficiary **Department** is led by an Elected Official, such Elected Official shall be considered a third-party beneficiary.

28. Colorado Open Records Act: County may disclose any records that are subject to public release under the Colorado Open Records Act, C.R.S. § 24-72-200.1, et seq.

29. Conflict of Provisions: If there is any conflict between the terms of the main body of this Contract and the terms of any of the **Contract Documents**, the terms of the main body of the Contract will control.

30. Governmental Immunity: Nothing in this Contract shall be construed in any way to be a waiver of the County's immunity protection under the Colorado Governmental Immunity Act, C.R.S. § 24-10-101, et seq., as amended.

31. Representations and Warranties: Contractor represents and warrants the following:

- a. Execution of this Contract and performance thereof is within Contractor's duly authorized powers;
- b. The individual executing this Contract is authorized to do so by Contractor;
- c. Contractor is authorized to do business in the State of Colorado and is properly licensed by all necessary governmental and public and quasi-public authorities having jurisdiction over the Work and the Contractor; and



- d. Contractor and its subcontractors, if any, are financially solvent, able to pay all debts as they mature, and have sufficient working capital to complete the Work and perform all obligations under the Contract.
32. Legal Compliance: Contractor assumes full responsibility for obtaining and maintaining any permits and licenses required to perform the Work. Contractor is solely responsible for insuring that its performance under this Contract and the Work itself will comply with all Federal, State, and local laws, regulations, ordinances and codes. Contractor shall promptly notify County if any drawings or specifications are at variance with any laws, regulations, ordinances, or codes. If Contractor performs any Work contrary to such laws, regulations, ordinances, or codes, Contractor shall bear all costs arising therefrom. County approval of the Work or any aspect of Contractor's performance, such as drawings, specifications, plans, designs, or other Contractor-drafted documents, shall not be interpreted to mean that Contractor has satisfied its obligations under this Section.
33. Litigation Reporting: Contractor is not currently involved in any action before a court or other administrative decision-making body that could affect Contractor's ability to perform the Work. Contractor will promptly notify the County if Contractor is served with a pleading or other document in connection with any such action.
34. Tax Exemption: County is exempt from payment of Federal, State, and local government taxes. Contractor shall collect no tax from the County, and the County shall not be liable to pay any taxes imposed on Contractor. County shall provide its tax exemption status information to Contractor upon request.
35. Delegation of Authority: The Parties acknowledge that the Board of County Commissioners has delegated authority to the Department Head or Elected Official that leads the beneficiary **Department** and their designees to act on behalf of the County under the terms of this Contract, including but not limited to the authority to terminate this Contract.
36. Ownership of Work Product: All work product, property, data, documentation, information or materials conceived, discovered, developed or created by Contractor pursuant to this Contract ("Work Product") will be owned exclusively by the County. To the extent possible, any Work Product will be deemed to be a work made for hire. Contractor unconditionally and irrevocably transfers and assigns to the County all right, title and interest in and to any Work Product.
37. Publicity Releases: Contractor will not refer to this Contract or the County in commercial advertising without prior written consent of the County. This provision shall survive expiration or termination of this Contract.
38. Execution by Counterparts; Electronic Signatures: This Contract may be executed in multiple counterparts, each of which will be deemed an original, but all of which will constitute one agreement. The Parties approve the use of electronic signatures, governed by the Uniform Electronic Transactions Act, C.R.S. §§ 24 71.3 101 to 121. The Parties will not deny the legal effect or enforceability of this Contract solely because it is in electronic form or because an electronic record was used in its creation. The Parties will not object to the admissibility of this Contract in the form of electronic record, or paper copy of an electronic document, or paper copy of a document bearing an electronic signature, because it is not in its original form or is not an original.
39. Limitation on Public Statements and Lobbying Activity. During the term of this Contract, Contractor may receive from the County its confidential data, work product, or other privileged or confidential information that is protected by law. To maintain the fact and appearance of absolute objectivity, Contractor shall not, without the prior written consent of the County, which shall not be unreasonably withheld, do any of the following: (a) disclose information obtained because of this contractual relationship to any third party; (b) lobby any State or Federal agency on any pending matter while this Contract is effective; or (c) make any public statements or appear at any time to give testimony at any public meeting on the subject matters regarding which Contractor is or was retained by the County. County may set reasonable conditions on any

disclosure authorized by the County under this provision. Notwithstanding, Contractor may make disclosures as required by law, and to law enforcement officials in connection with any criminal justice investigation.

40. Sustainability: All construction, deconstruction, remodel, and office move projects are required to follow construction waste procedure modeled off of Boulder County BuildSmart Code, International Green Construction Code (IGCC), International Energy Conservation Code (IECC), and Leadership in Energy and Environmental Design (LEED) certification, as an effort to achieve maximum jobsite waste diversion, energy efficiency, and water conservation. All ‘demolition projects’ are to follow deconstruction procedures. Instead of demolition project materials being crushed and primarily sent to the landfill, these projects should be systematically dismantled, typically in the opposite order they were constructed, in order to maximize the salvage of materials. Any hazardous materials encountered should follow state and federal standards, and contractor shall leverage the Boulder County Hazardous Materials Management facility for hazardous materials. The development of a project diversion plan is encouraged to include material types and volume/weight estimations as well as planned destinations. Projects must track all jobsite waste.

41. Limitation of Liability: COUNTY SHALL NOT BE LIABLE TO CONTRACTOR FOR ANY SPECIAL, CONSEQUENTIAL, INCIDENTAL, PUNITIVE, OR INDIRECT DAMAGES ARISING FROM OR RELATING TO THIS CONTRACT, REGARDLESS OF ANY NOTICE OF THE POSSIBILITY OF SUCH DAMAGES. COUNTY’S AGGREGATE LIABILITY, IF ANY, ARISING FROM OR RELATED TO THIS CONTRACT, WHETHER IN CONTRACT, OR IN TORT, OR OTHERWISE, IS LIMITED TO, AND SHALL NOT EXCEED, THE AMOUNTS PAID OR PAYABLE HEREUNDER BY COUNTY TO CONTRACTOR. ANY CONTRACTUAL LANGUAGE LIMITING CONTRACTOR’S LIABILITY SHALL BE VOID.

42. County Opportunity to Review: Contractor shall provide County with the opportunity to review and approve or take other appropriate action upon the Contractor’s submittals, such as Shop Drawings, Product Data, and Samples, but only for conformance with the design concept of the Work and with the information given in the Contract Documents.

43. Notice to Proceed: The Parties agree that time is of the essence and work will begin after a “Notice to Proceed” has been issued by the County and in accordance with the terms therein.

44. Retainage: County may retain partial payment pending completion and County acceptance of the Work as satisfactory and fully and finally complete. For contracts that exceed \$150,000, the retention rate shall not exceed five percent (5%). C.R.S. § 24-91-103. Contractor is responsible for submitting a final invoice for any retainage held by County. If it becomes necessary for County to take over completion of the Work, all of the amounts owing to Contractor, including the withheld percentage, shall be applied: First, towards completion of the Work; second, towards performance of the withholding requirement set forth in C.R.S. § 38-26-107; third, to the surety furnishing bonds for the Work, to the extent such surety has incurred liability or expense in competing the Work or made payments pursuant to C.R.S. § 38-26-106; then, to Contractor. Such retained percentage as may be due to Contractor shall be due and payable as provided by C.R.S. § 38-26-107.

45. Bonds: Upon County’s request, Contractor shall obtain and deliver to County payment and performance bonds each equal to 100% of the total Contract. Bonds shall be executed by a qualified corporate surety and must be acceptable to County. County reserves the right to accept other acceptable forms of surety in lieu of a bond, and to reduce the bond requirements set forth herein consistent with C.R.S. § 38-26-106.

46. Change Orders: If unforeseen modifications or changes are required, Contractor may submit a Change Order request to County, which must include a complete description, timeline, and fee schedule for the proposed work. Change Orders are not effective until approved by County in writing.

47. No Suspension or Debarment: Contractor certifies, and warrants for the duration of this Contract, that neither it nor its principals nor any of its subcontractors are debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this Contract by any Federal or State department or agency. Contractor shall comply, and shall require its subcontractors to comply, with subpart C of 2 C.F.R. § 180.

48. Permits/Licenses/Code Compliance: Prior to starting the Work, Contractor will identify and obtain, and maintain during this Contract, all permits and licenses necessary to perform the Work. Contractor shall comply with all State and local codes. Contractor is responsible for locating all public utilities, as necessary. Contractor shall require its subcontractors to comply with this provision. HVAC, roofing, and general contractors must be licensed through Boulder County Land Use. Electricians and plumbers must be licensed through the State and registered with Boulder County Land Use Building Safety and Inspection Division. Architects, Professional Engineers and Professional Land Surveyors must be fully-licensed through the State. All required permits and licenses must be provided to County prior to Contractor beginning the Work.

49. Stormwater Quality Protection Requirements: Contractor will take all measures necessary to prevent pollutants from entering storm drains and watercourses. To eliminate stormwater pollution, Contractor shall implement effective Best Management Practices (BMPs). BMPs include general good housekeeping practices, appropriate scheduling of activities, operational practices, maintenance procedures and other measures to prevent the discharge of pollutants directly or indirectly to the storm drain system. These BMPs shall be maintained for the duration of this Contract. Contractor shall also be responsible for proper disposal of all waste materials, including wastes generated by the implementation of BMPs. Contractor shall otherwise comply with the Federal Clean Water Act, Colorado Water Quality Control Act, and Boulder County's local Clean Water Act, Illegal Discharge Ordinance (No. 2012-4). For work performed in urbanized areas, Contractor must comply with the requirements of MS4 permit (COR090000), which is available through the Colorado Department of Public Health and Environment.

50. Guaranties and Warranties: Upon completion of the Work, Contractor will provide County with a written guaranty covering all labor, materials and workmanship incorporated into the Work for one (1) year, or within any such longer period of time as may be prescribed by law, the specifications, or any other applicable special warranty required by the **Contract Documents**. Final payment upon full and final completion of the Work will not relieve Contractor of responsibility for faulty material or workmanship, which County may require Contractor to fix at Contractor's sole expense, in addition to County's other remedies. This provision shall apply to Work completed by Contractor's employees and subcontractors.

51. Final Payment: A final inspection of the Work shall be conducted by County. If a list of deficiencies results from such final inspection, Contractor shall promptly rectify all items appearing thereon before final payment will be made. When County indicates acceptance of the Work, Contractor may request final payment from County, including any retained amounts. Final payment shall be subject to C.R.S. § 38-26-107.

52. Notice of Final Settlement: Prior to remitting final payment to Contractor, County shall publish a Notice of Final Settlement in accordance with C.R.S. § 38-26-107. Final payment will be rendered in accordance with the statute and the other terms of this Contract. Final payment will not be rendered until County, in its sole discretion, determines full and final completion of the Work.

53. Geographic Information System (GIS) Data: Contractors agree that the following, specified data formats, shall be used and/or adhered to when submitting required data to the County:

a. All GIS data must be ArcGIS 10.x compatible. Shapefiles may be accepted with written, pre-approval, from the County.

b. All GIS data must have complete metadata, following Boulder County GIS Metadata Standards located at: <https://assets.bouldercounty.org/wpcontent/uploads/2018/03/metadata-standards-contractors.pdf>

c. All Computer Aided Design (CAD) files must have an assigned real world coordinate system to ensure compatible conversion into the County’s GIS system, if necessary.

d. All spatial or georeferenced data will be provided to the county in the following coordinate system:

i. Name:

NAD 1983 HARN State Plane Colorado  
 North FIPS 0501 Feet

ii. Unit:

Foot US

iii. Projection:

Lambert Conformal Conic

iv. Horizontal Datum:

North American Datum 1983 HARN

v. Vertical Datum:

North American Vertical Datum 1988

vi. Spheroid:

GRS 1980

e. Contractors are responsible for capturing section corners or quarter corners for specific projects to be added into the Public Land Survey System (PLSS) project for updating the section corners, Contractors shall provide high-accuracy PLSS monument coordinates for each corner section or quarter corner section monument used as control points or that occur within the project area (“putting it on the cap”) as is reasonable, depending on the difficulty to access the point. All positions to be collected shall be required to use (at a minimum) the Real-Time Kinematic (RTK) method.

54. State Specifications: The Standard Specifications for Road and Bridge Construction 2017, either in whole or as set forth in the Bid Documents, are expressly incorporated into this Contract by reference.

55. Determination of Unit Prices: County will determine the actual quantities and classifications of Unit Price Work performed by Contractor. The Parties will review the County's preliminary determinations before County renders a written decision thereon (by recommendation of an Application for Payment or otherwise), which shall be final and binding upon Contractor. The value of any Unit Price Work covered by a Change Order or claim for an increase or decrease in the Contract Amount shall be determined by applying the unit prices to the quantities of items.

a. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, the Parties agree that the Contract Amount includes the total cost of Unit Price Work, determined by multiplying the quantity of each item by its unit price. Initial quantity determinations are estimates, which must be adjusted to reflect actual quantities. Contractor shall make a claim in writing to County for any additional amounts owed where actual quantities exceed estimated quantities. Contractor shall provide such written claim within twenty (20) days of providing the items and shall be accompanied by supporting documentation. The written claim shall include a statement that the claimed amount covers all known amounts (direct, indirect and consequential) to which Contractor is owed. County shall only pay Contractor for actual quantities of items provided hereunder.

b. The Parties agree that each unit price adequately covers Contractor’s overhead and profit for each item.

56. Records Retention/Access/Audits: Contractor shall maintain all records and documents pertaining to this Contract in accordance with the requirements prescribed by County. Such records shall be maintained for a period of five (5) calendar years after the date of Contractor’s final payment from County under this Contract. Contractor agrees that County or their designated representative shall have the right to review and to copy any records and supporting documentation pertaining to the performance of this Contract as necessary and upon request, throughout the term of this Contract, and for five (5) calendar years after the date of the final payment hereunder. Contractor agrees to allow the auditor(s) access to such records during normal business hours and to allow interviews of any employees who might reasonably have information

related to such records. County and Contractor acknowledge that protected information is exempt from this requirement without proper client release.

57. Insurance: Prior to commencing the Work, Contractor will provide a Certificate of Insurance to the County demonstrating adequate insurance coverage as required by this paragraph. All policies evidencing coverage required by the Contract will be issued by insurance companies satisfactory to the County. Contractor will forward Certificates of Insurance directly to the **County Department** and **Contact** listed in the **Details Summary**.

a. Boulder County as Additional Insured: Boulder County shall be named as an additional insured for General Liability, Umbrella/Excess Liability, and Pollution Liability, as designated in this Contract. Additional insured shall be endorsed to the policy.

**THE ADDITIONAL INSURED WORDING SHOULD BE AS FOLLOWS**: *County of Boulder, State of Colorado, a body corporate and politic, is named as Additional Insured.*

b. Notice of Cancellation: Each insurance policy required by this Contract shall provide the required coverage and shall not be suspended, voided or canceled except after thirty (30) days' prior written notice has been given to the County except when cancellation is for non-payment of premium, then ten (10) days' prior notice may be given. If any insurance company refuses to provide the required notice, Contractor or its insurance broker shall notify the County any cancellation, suspension, or nonrenewal of any insurance policy within seven (7) days of receipt of insurers' notification to that effect.

c. Insurance Obligations of County: County is not required to maintain or procure any insurance coverage beyond the coverage maintained by the County in its standard course of business. Any insurance obligations placed on the County in any of the **Contract Documents** shall be null and void.

d. Deductible: Any and all deductibles contained in any insurance policy shall be assumed by and at the sole risk of Contractor.

e. Primacy of Coverage: Coverage required of Contractor and its subcontractors, if any, shall be primary over any insurance or self-insurance program carried by the County.

f. Subrogation Waiver: All insurance policies in any way related to this Contract secured or maintained by Contractor as required herein shall include clauses stating that each carrier shall waive all rights of recovery, under subrogation or otherwise, against County, its organizations, officers, agents, employees, and volunteers.

g. Requirements. For the entire duration of this Contract including any extended or renewed terms, and longer as may be required by this Contract, Contractor shall procure and maintain at its own expense, and without cost to the County, the following kinds and minimum amounts of insurance to insure the liability risks that Contractor has assumed under this Contract:

## **INSURANCE REQUIREMENTS**

### **i. Commercial General Liability**

This coverage should be provided on an Occurrence Form, ISO CG001 or equivalent, with Minimum limits of \$1,000,000 Each Occurrence, \$2,000,000 General Aggregate and \$2,000,000 Products Completed Operations Aggregate.

### **ii. Automobile Liability**

Bodily Injury and Property Damage for any owned, hired, and non-owned vehicles used in the performance of the Contract. Minimum limits \$1,000,000 Each Accident.

### **iii. Workers' Compensation and Employer's Liability**

Workers' Compensation must be maintained with the statutory limits. Employer's Liability is required for minimum limits of \$100,000 Each Accident/\$500,000 Disease-Policy Limit/\$100,000 Disease-Each Employee.

**iv. Umbrella / Excess Insurance**

Umbrella/Excess Liability insurance in the amount \$3,000,000.00, following form.

**v. Pollution Liability**

Coverage pay for those sums the Contractor becomes legally obligated to pay as damages because of Bodily Injury, Property Damage or environmental Damage arising out of a pollution incident caused by the Contractor's work including Completed Operations. Coverage shall include emergency response expenses, pollution liability during transportation (if applicable) and at Non-Owned Waste Disposal Site (if applicable). The Minimum limits required are \$1,000,000 Per Occurrence/Loss and \$1,000,000 Policy Aggregate. If the coverage is written on a claims-made basis, the Contractor warrants that any retroactive date applicable to coverage under the policy precedes the effective date of this Contract; and that continuous coverage will be maintained or an extended discovery period will be exercised for a period of three (3) years beginning from the time that work under this contract is completed. County shall be named as an additional insured for ongoing operations and completed operations.

**[Signature Page to Follow]**

IN WITNESS WHEREOF, the Parties have executed and entered into this Contract as of the latter day and year indicated below.

<b>SIGNED for and on behalf of Boulder County</b>		<b>SIGNED for and on behalf of Contractor</b>	
Signature:		Signature:	
Name:		Name:	
Title:		Title:	
Date:		Date:	
↓↓ <i>For Board-signed documents only</i> ↓↓			
Attest:		<i>Initials</i>	
Attestor Name:			
Attestor Title:			



**DEPARTMENT OF THE ARMY**  
CORPS OF ENGINEERS, OMAHA DISTRICT  
DENVER REGULATORY OFFICE  
9307 SOUTH WADSWORTH BLVD  
LITTLETON, CO 80128-6901

October 06, 2022

**SUBJECT: Nationwide Permit Verification; NWO-2020-01502-DEN, Riverside Drive Bridge Replacement Project near Raymond, CO in Boulder County**

Colton Coughlin  
Boulder County Public Works  
P.O. Box 471  
Boulder, Colorado 80306

Dear Mr. Coughlin:

This letter is in response to your July 27, 2020, Pre-construction Notification (PCN), requesting Department of the Army (DA) Nationwide Permit (NWP) verification for the above-referenced project. The project site is located at Latitude 40.154628°, Longitude -105.466272°, within Section 9, Township 2 N, Range 72 W, Boulder County, Colorado.

For the above-referenced project, you propose to discharge 125 cubic yards of riprap for erosion control and slope stabilization. The project is expected to generate approximately 313 square feet, 0.007 acres of permanent impacts and 1,670 square feet, 0.038 acre of temporary impacts to wetlands.

The U.S. Army Corps of Engineers (Corps) regulates the discharge of dredged and fill material into waters of the United States under Section 404 of the Clean Water Act (CWA) (33 U.S.C. 1344) and structures or work in, over, and under navigable waters of the United States under Section 10 of the Rivers and Harbors Act (RHA) (33 U.S.C. 403). The Corps' regulations are published in the Code of Federal Regulations at 33 CFR parts 320 through 332. NWPs are defined in the Federal Register published on December 27, 2021 (86 FR 73522) and January 13, 2021 (86 FR 2744). Based on a review of the information you furnished and available to us, we have determined the above referenced work requires DA authorization under Section 404 of the CWA.

Based upon the information you provided, we hereby verify that the work described above, which would be performed in accordance with the plans you provided dated July 23, 2020, is authorized by **NWP 14 Linear Transportation Projects**. Please note that deviations from the original plans and specifications of your project could require additional authorization from this office. This NWP and associated Regional and General Conditions are enclosed and can be accessed on our website at: <https://www.nwo.usace.army.mil/Missions/Regulatory-Program/Colorado>. Failure to



comply with the General and Regional Conditions of this NWP, or the project-specific special conditions of this authorization, may result in the suspension or revocation of your authorization, and you may be subject to appropriate enforcement action. You shall comply with all terms and conditions associated with this NWP.

Unless this NWP is suspended, modified, or revoked, it is valid until **March 14, 2026**. It is incumbent upon you to remain informed of changes to this NWP. We will issue a public notice when the NWPs are reissued. Furthermore, if you commence or are under contract to commence this activity before the date that the relevant NWP is modified or revoked, you will have twelve (12) months from the date of the modification or revocation of the NWP to complete the activity under the present terms and conditions of this NWP unless discretionary authority has been exercised on a case-by-case basis to modify, suspend, or revoke the authorization as per 33 CFR 330.6(b). Any project specific conditions listed in this letter continue to remain in effect after the NWP verification expires unless the district engineer removes those conditions.

To assist in your compliance with NWP General Condition 30, enclosed is a "Compliance Certification" form, which shall be signed and returned within 30 days of completion of the project, including any required mitigation. Your signature on this form certifies that you have completed the work in accordance with the terms and conditions of the NWP. Activities completed under the authorization of an NWP, which was in effect at the time the activity was completed, continue to be authorized by that NWP.

Authorizations under this NWP does not relieve permittees from obtaining permits or other authorizations from any required federal, state, or local agency.

If you have any questions, please contact David Liccione via email at [David.J.Liccione@USACE.Army.Mil](mailto:David.J.Liccione@USACE.Army.Mil), by mail at the address above, or by phone at 720-922-3841.

Sincerely,



Kiel Downing  
Chief, Denver Regulatory Office

Enclosures

cc:

U.S. Fish and Wildlife Service  
Colorado Department of Public Health and Environment  
Colorado Parks and Wildlife  
Environmental Protection Agency

The Omaha District, Regulatory Branch is committed to providing quality and timely service to our customers. In an effort to improve customer service, please take a moment to complete our Customer Service Survey found on our website at: <https://regulatory.ops.usace.army.mil/customer-service-survey/>.

**COMPLIANCE CERTIFICATION**

**USACE File Number:** NWO-2020-01502-DEN  
**Permit Type:** NWP 14 Linear Transportation Projects  
**Name of Permittee:** Colton Coughlin, Boulder County Public Works  
**County:** Boulder County, Colorado  
**Date of Issuance:** October 06, 2022  
**Project Manager:** David Liccione

Upon completion of the activity authorized by this permit and any mitigation required by the permit, sign this certification and return it to:  
DenverRegulatoryMailbox@USACE.Army.Mil or the following address:

**CORPS OF ENGINEERS, OMAHA DISTRICT  
DENVER REGULATORY OFFICE  
9307 SOUTH WADSWORTH BLVD  
LITTLETON, CO 80128-6901**

Please note that your permitted activity is subject to a compliance inspection by a U.S. Army Corps of Engineers representative. If you fail to comply with the conditions of this permit, you are subject to permit suspension, modification, or revocation.

-----

I hereby certify that the work authorized by the above referenced permit has been completed in accordance with the terms and conditions of the said permit, and required mitigation was completed in accordance with the permit conditions.

\_\_\_\_\_  
Signature of Permittee

\_\_\_\_\_  
Date



**COMMUNITY PLANNING &  
PERMITTING DEPARTMENT**  
2045 13th Street · Boulder CO 80302  
PO Box 471 · Boulder CO 80306  
Phone: 303-441-3930  
floodplainadmin@bouldercounty.org

**OFFICE USE**  
Floodplain Permit Number: FDP-23-005  
Building Permit Number:  
Docket Number:  
Effective Date: 4/6/2023

**FLOODPLAIN DEVELOPMENT PERMIT**

OWNER AND PROPERTY INFORMATION			
Applicant/Owner Name: Boulder County Public Works		Phone:	
Address:		Fax:	
City: BOULDER	State: CO	Zip:	
Engineer/Contractor Name: Short Elliott Hendrickson Inc.		Phone: 720-540-6847	
Address: 2000 S Colorado Boulevard, Suite 6000		Fax:	
City: Denver	State: CO	Zip: 80222	
PROJECT INFORMATION			
Location of Development: 0 RIVERSIDE DRIVE		City: UNINCORPORATED	
Section/Township/Range: 9/2N/72			
Permit Category: Bridge/Culvert			
Description of Development: The existing stone and concrete Riverside Drive bridge over Cave Creek will be replaced by a concrete box culvert. Minor changes to roadway geometry will be made requiring a small amount of fill in the adjacent Middle St. Vrain Creek. A small amount of excavation will be made in MSVC to compensate for the fill.			
REMODELS AND REDEVELOPMENT ONLY			
Cost of Improvement for this project:			
Value of Structure: (submit current (within 1 year) appraiser's valuation of structure)			
Percent Improvement:			
Substantial Improvement:		<input type="checkbox"/> Yes	<input type="checkbox"/> No (Yes, if cost of project ≥ 50% of appraised valuation)
If no, have other improvements been made to the structure since Sept. 11, 2013?		<input type="checkbox"/> Yes	<input type="checkbox"/> No
Cumulative Percent of All Improvements:			
Substantial Improvement:		<input type="checkbox"/> Yes	<input type="checkbox"/> No (Yes, if cost of improvements since Sept. 11, 2013 ≥ 50% of appraised valuation)
FLOODPLAIN INFORMATION			
Floodplain Name: <input type="checkbox"/> FEMA <input type="checkbox"/> Boulder County <input type="checkbox"/> Other		Flooding Source: Middle St. Vrain Creek	
Flood Zone Designation: A, AE, AO - 1% annual chance floodplain			
Base Flood Elevation:		<input type="checkbox"/> NGVD (29)	<input checked="" type="checkbox"/> NAVD (88)
Flood Protection Elevation:		<input type="checkbox"/> NGVD (29)	<input checked="" type="checkbox"/> NAVD (88)
Floodway: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (If yes, please submit Engineers report addressing those standards set forth in Article 4-404.2E)			
<input type="checkbox"/> Title Report		<input type="checkbox"/> Floodway Analysis	<input type="checkbox"/> Permit Advertised <input type="checkbox"/> Cross Section
<input type="checkbox"/> Description of extent to which water course will be altered			

REGULATORY REQUIREMENTS				
Structure is:	<input type="checkbox"/> Elevated	<input type="checkbox"/> Floodproofed	<input type="checkbox"/> Vented	<input type="checkbox"/> n/a
Elevation and/or Floodproofing Certificate:	<input type="checkbox"/> Yes	<input type="checkbox"/> No		
If floodproofed, describe method:				
Lowest floor elevation:	<input type="checkbox"/> NGVD (29)		<input type="checkbox"/> NAVD (88)	
Elevation of garage slab:	<input type="checkbox"/> NGVD (29)		<input type="checkbox"/> NAVD (88)	
Lowest elevation of HVAC equipment (and other mechanical equipment):	<input type="checkbox"/> NGVD (29)		<input type="checkbox"/> NAVD (88)	
Enclosed area (not floodproof or elevated): square feet				
Number of Vents:		Area of vents: square inches		
<b>FOR STRUCTURES: Attach building plans showing foundation design, flood elevation, floor elevations, HVAC and other mechanical equipment elevations, size and location of vents, floodproofing design and other relevant information that address those standards set forth in Article 4-400.</b>				
<b>FOR SITE WORK: Attach site and grading plans and other relevant information. All plans must be stamped and signed by a Colorado Registered Professional Engineer</b>				
CONDITIONS				
<p>1. This Floodplain Development Permit (FDP) shall expire two years after the date of issuance if the permittee has not commenced construction under the permit.</p> <p>2. The permittee shall obtain approval of all necessary local, state, and federal permits prior to beginning work.</p> <p>3. All work must be constructed in accordance with all federal, state, and local regulations, including without limitation, Boulder County Land Use Code, the Boulder County Storm Drainage Criteria Manual, and the Boulder County Multimodal Transportation Standards. Applicant is responsible for determining and following all applicable regulations and requirements not specifically listed.</p> <p>4. Construction equipment, material, and waste shall be located outside the regulatory floodplain when not in use.</p> <p>5. The Project shall be constructed in accordance with and limited to the work contained in the submitted plans entitled "Minor Structure Replacement of Riverside Drive Over Cave Creek" signed and stamped by Stephen E. Kaye, P.E. dated 3/24/23, "Revised Hydraulic Report – Riverside Drive Bridge Over Cave Creek" signed and stamped by David J. Hoesley dated 3/23/2023, and the Certificate of No-Rise in the Floodway signed and stamped by Jennifer M. Russell, P.E., dated 7/14/2020. Additional work adjacent to or in the vicinity of this permitted work but not a part of the approved project will require a separate Floodplain Development Permit.</p> <p>6. Upon project completion, the permittee shall submit a Final Certification Letter from a Colorado Registered Professional Engineer to the Floodplain Management Program in the Community Planning &amp; Permitting Department (floodplainadmin@bouldercounty.org) certifying whether the project was constructed and installed substantially according to the approved design plans. The letter must be supported by as-built drawings. The letter and drawings must document and approve any deviations from the permitted design plans. If the P.E. certifies that no changes are needed to the hydraulic modeling based on as-built conditions, then closeout requirements such as a Letter of Map Revision (LOMR) will be determined based on the hydraulic model submitted for permitting. If the P.E. cannot certify that no changes are needed to the hydraulic modeling submitted for permitting based on as-built conditions, then an as-built hydraulic model and accompanying report and plans representing post-project conditions shall be submitted to the Floodplain Management Group. Closeout requirements such as a LOMR or any required mitigation will be determined based on the as-built hydraulic modeling.</p>				
REQUIRED FOR PERMIT CLOSEOUT				
<input checked="" type="checkbox"/> As-built survey with PE/PLS stamp	<input checked="" type="checkbox"/> Letter with PE/PLS stamp	<input type="checkbox"/> Letter		
<input type="checkbox"/> Photographs	<input type="checkbox"/> FEMA Elevation Certificate	<input type="checkbox"/> Other		
<input checked="" type="checkbox"/> LOMR	Other:			
CERTIFICATION				
<p>By accepting this final permit, I agree to construct the project in accordance with all site plans, building plans and specifications submitted herewith, and in strict compliance with all provisions of the Land Use Code, Building Code, and Public Health Regulations of Boulder County.</p> <p>The applicant may begin work under this permit as of the date the permit is signed and issued by the Floodplain Administrator. If the applicant begins work during the 30 days immediately following permit issuance (permit appeal period under Article 4-408 of the Land Use Code), the applicant does so at their own risk, as some or all of the work may need to be modified or removed at the applicant's expense in the event of appeal.</p>				
Floodplain Administrator Approval				
Floodplain Administrator:	Kelly Watson		Date:	4/6/2023

# **GEOCAL**

**GEOSCIENCES & ENGINEERING**  
7290 South Fraser Street  
Centennial, Colorado 80112-4286  
Phone: 303-337-0338  
Fax: 303-337-0247



## **SUBSURFACE EXPLORATION REPORT**

### **Boulder County Minor Structures Replacement Riverside Drive over Cave Creek Boulder County, Colorado**



**Prepared For**

**Short Elliot Hendrickson, Inc.**  
Mr. Steve Kaye, P.E.  
2000 S. Colorado Blvd.  
Tower 1, Suite 6000  
Denver, CO 80222

**December 15, 2020**

# GEOCAL

GEOSCIENCES & ENGINEERING  
7290 South Fraser Street  
Centennial, Colorado 80112-4286  
Phone: 303-337-0338  
Fax: 303-337-0247



## SUBSURFACE EXPLORATION REPORT

### Boulder County Minor Structures Replacement Riverside Drive over Cave Creek Boulder County, Colorado

By: Matthew B. Coen, E.I.  
Staff Engineer



And By: Walter J. Zitz, P.E.  
Project Manager

Reviewed By: Nur Hossain, Ph.D., P.E.  
Principal Engineer

Prepared For

Short Elliot Hendrickson, Inc.  
Mr. Steve Kaye, P.E.  
2000 S. Colorado Blvd.  
Tower 1, Suite 6000  
Denver, CO 80222

December 15, 2020  
G18.1853.000

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## 1.0 PURPOSE AND SCOPE

This report contains the results of a subsurface exploration conducted for the replacement of the Riverside Drive bridge over Cave Creek, located near Raymond, in Boulder County Colorado. The subsurface exploration was conducted to obtain information regarding the soil, bedrock, and groundwater conditions. Soil and bedrock samples collected were visually classified, and selected samples were laboratory tested to evaluate strength, classification, and other engineering properties. The results of the field and laboratory testing programs were evaluated to develop geotechnical recommendations for the proposed foundation and pavement design.

This report has been prepared to summarize the data and to present our conclusions and recommendations based on the proposed construction and the subsurface conditions encountered. Design parameters and a discussion of geotechnical engineering considerations related to design of the proposed structure are included. We were initially tasked with drilling one boring at the Riverside Drive Bridge and one boring at the Overland Road Bridge. The results of the subsurface exploration at the Overland Road Bridge are addressed in a separate report. Environmental considerations related to hazardous materials are beyond the scope of this study. The exploration was conducted in accordance with Geocal's agreement for professional services with SEH, Inc. (SEH), dated November 28, 2018.

## 2.0 PROPOSED CONSTRUCTION

Geocal reviewed the Final Construction Plans, dated October 2020, provided by SEH. We understand that the proposed construction will include the replacement of the Riverside Drive bridge over Cave Creek (Boulder County Structure # BC-010301-0.9). The new structure along Riverside Drive is expected to consist of a 14-foot wide by 7-foot tall (interior dimensions) concrete box culvert (CBC) with cast-in-place concrete headwalls, wingwalls, and toewalls. The Riverside Drive pavement in the area of the new bridge is expected to be replaced. If the proposed construction or conditions are significantly different from that described, this office should be notified to re-evaluate the recommendations contained in this report.

### 3.0 SITE CONDITIONS

The Riverside Drive bridge is located approximately 1 mile east of Highway 72 near Raymond, Colorado, and approximately 6 miles northeast of the Town of Ward. The bridge carries Riverside Drive over Cave Creek, which flows to the south into to the adjacent Middle Saint Vrain Creek, approximately 30 feet south of the bridge. Riverside Drive is an asphalt-paved, 2-lane local roadway. The existing bridge was constructed in 1930 and consists of a single-span concrete slab bearing on stone masonry abutments. The bridge has a span length of approximately 12 feet with a deck width of about 20 feet. We understand that abutment masonry is severely degraded and cracked with loose and missing stones in the wingwalls and abutments. There was minimal observed pavement distress in the asphalt pavement on the bridge deck (mainly widely spaced unsealed transverse cracks at the junction of the abutment and approach slab). At the time of our field work, approximately 2 feet of water was flowing in the channel. Granite boulders up to 3 feet in diameter were observed in the channel at the time of drilling. The roadway over the bridge was approximately 7 feet above the existing stream channel. A general view of the bridge and roadway is shown in the following Figures A and B.



Figure A: General view Riverside Drive over Cave Creek



Figure B: Elevation view of upstream side

## 4.0 GEOLOGY

The project area is located in a stream valley within the physiographic province classified as the Front Range. This province is characterized by narrow ridges with deep canyons that widen upstream. Large valleys characterized as rolling uplands are carved out by glaciation and streams in the mountains.

The bridge is located at the base of a south facing slope within the floodplain of the Middle Saint Vrain Creek (near confluence with Cave Creek). The geologic map does not indicate that surficial soils are present at the bridge location, however, based on Geocal's field observations, about 15 feet of loose to dense, brown, silty sand with some occasionally coarser grained material (alluvium) was encountered at the bridge location. The unconsolidated surficial soils extend down to bedrock. Geologic mapping indicates a brecciated zone near the drilling area which could generate the sandy overburden as well as large boulders composed of material similar to the local bedrock. Bedrock in the area is Silver Plume Granite which is composed of gray to orange-pink, hard to very hard, fine to coarse grained rock with variable amounts of phenocrysts. The rock is generally composed of quartz and oligoclase with lesser amounts of microcline, biotite, and other accessory minerals. Groundwater is typically encountered above the bedrock, approximately 5 feet to 10 feet below grade within the stream valleys. The water level is dependent upon the seasonal weather variations and the water level in Cave Creek.

## 5.0 SUBSURFACE EXPLORATION

The subsurface exploration for the project was conducted on July 3, 2019 and consisted of drilling one boring (Boring B-2) at the approximate location shown on Figure 1, Location of Exploratory Boring. Boring B-1 was drilled for the Overland Road Bridge which is addressed in a separate report. The boring was drilled to approximately 23 feet with a truck-mounted drill rig equipped with 4-inch diameter ODEX core bits.

Soil and bedrock samples were collected using a nominal 2-inch I.D. Modified California spoon sampler (ASTM D3550), or a 1½ inch I.D. split spoon sampler (ASTM D1586). The penetration resistance values, when properly evaluated, indicate the relative consistency or density of the soils or bedrock hardness. Samples were obtained at approximately 5-foot depth intervals. The boring was logged by a representative of Geocal, Inc.

Samples collected from the boring were transported to our laboratory for review by our Project Engineer, and selected samples were programmed for laboratory testing.

The log of the subsurface conditions encountered, including depths at which samples were collected, penetration resistance values, and groundwater information, is shown on Figure 2, Fence Diagram of Exploratory Boring. Descriptions of the materials encountered and notes regarding the symbols used are presented on Figure 3, Legend and Notes for the Exploratory Boring. The individual boring log is provided in Appendix A.

## 6.0 SUBSURFACE CONDITIONS

Boring B-2 was drilled from the westbound lane of Riverside Drive near the west abutment and encountered 5 inches of asphalt pavement at the surface. Aggregate base course (ABC) was not encountered below the asphalt pavement in the boring. Artificial fill was not encountered in the boring, however, the upper portion of the natural subgrade soils may have been re-worked for roadway construction. Natural soils consisting of loose to dense, grayish-brown silty sands with variable amounts of coarse sand and gravel were encountered under the asphalt pavement and extended down to bedrock. A boulder approximately 2 feet thick was encountered while drilling at a depth of 7 feet. Granitic bedrock was encountered at a depth of approximately 13½ feet. Bedrock was hard to very hard, stratified, light gray, and was moderately to highly weathered in the top 5 feet. The degree of weathering decreased with depth. Possible fault gouge was encountered at approximately 20 feet. Groundwater was encountered at approximately 7 feet below grade during drilling. However, the groundwater level can be expected to fluctuate depending on seasonal weather variations.

## 7.0 LABORATORY TESTING

Laboratory tests conducted on selected soil and bedrock samples consisted of gradation, Atterberg limits (liquid and plastic limits), R-value, and water-soluble chloride. The laboratory test results are presented on Figures 4 and 5 and are summarized in Table 1.

**Gradation and Atterberg Limits:** Soil samples were classified in accordance with the American Association of State Highway and Transportation Officials (AASHTO) and Unified Soil Classification systems. The classification systems are based on the Liquid Limit (ASTM D423), Plastic Limit (ASTM D424) and grain size distribution (ASTM D422). These parameters provide qualitative information on the suitability of the soils for use in civil engineering projects. Gradation and Atterberg limits test results are shown on Figure 4 and are summarized in Table 1. The combined gradation and Atterberg limits test results indicate that the soils tested were predominantly sands with variable amounts of silt and gravel. AASHTO soil classifications for these soils were A-1-a to A-1-b, which is indicative of non-plastic soils.

**Resistance R-value:** The R-value is a measure of the soil's ability to transfer traffic loading laterally. Test results are shown on Figure 5. A bulk sample collected from the upper 5 feet from Boring B-2. The sample classified as silty sand. The soil tested had an R-value of 64 and indicates that the onsite soils have relatively high strength for support of pavements.

**Water-Soluble Sulfate:** The water-soluble sulfate test is a measurement of the potential degree of sulfate attack on concrete exposed to the onsite soils. Sulfate solutions react with tri-calcium aluminate hydrate, which is a normal constituent of Portland cement concrete, forming calcium sulfo-aluminate hydrate with an accompanying substantial volume expansion which causes cracking. Sulfate expansion problems will typically exist when the soils have sulfate concentrations in excess of 0.10%.

The severity of potential exposure is based on a range of Class 0 (negligible) to Class 3 (severe), as presented in Table 601-2 of *Section 601.04 Sulfate Resistance* of the 2019 Colorado Department of Transportation (CDOT) *Standard Specifications for Road and Bridge Construction* (CDOT Standard Specifications). Water-soluble sulfates were not detected in the samples tested. The test results indicate that a Class 0 "Severity of Sulfate Exposure" is applicable for concrete exposed to the onsite soils and bedrock.

## 8.0 FOUNDATION RECOMMENDATIONS

Based on our understanding of the proposed construction and the subsurface conditions encountered, the proposed 4-sided CBC may be supported by a mat foundation (bottom of the box) below the scour depth. Shallow spread footings bearing on dense natural sands at least 3 feet below the scour depth may also be considered for

foundation support. Alternatively, the structure may be supported by deep foundations such as driven H-piles or drilled shafts (caissons) bearing in the underlying granite bedrock. Wingwalls that are continuous with the abutments should be supported by the same foundation type used to support the abutments. The following design and construction recommendations for mat foundations, conventional spread footings, driven H-piles, and drilled shafts are provided.

## 8.1 MAT FOUNDATION FOR CONCRETE BOX CULVERT (CBC)

The expected replacement structure is expected to consist of a 4-sided CBC, therefore, a mat foundation (bottom of the box) bearing on dense natural sands may be used for foundation support. The bearing elevation for a mat foundation should be at least 3 feet below the design scour depth. Any existing fill below the mat foundation bearing elevation should be replaced with new engineered fill materials as described in Section 12.0 of this report. The following additional geotechnical recommendations should be observed for a conventional mat type foundation.

- 1) Mat foundations should be placed on the natural dense to very dense sands or new engineered fill and be designed for a nominal bearing pressure of 2,000 pounds per square foot (psf). A modulus of subgrade reaction of 70 pounds per cubic inch (pci) may be used. The modulus is for a 1 square foot area and should be adjusted based on the mat size and proximity from the center of the mat. A resistance factor of 0.45 should be applied to the nominal bearing pressure.
- 2) Old artificial fill and any soft or deleterious material encountered in the foundation excavations should be removed and replaced with new engineered fill material. The bearing surface for mat foundations should be compacted with a heavy vibratory roller prior to forming for concrete. This will require that the contractor lower the groundwater level sufficiently to allow for compaction to occur, which can help mitigate liquefaction of the soils and help maintain the stability of the excavation. The contractor should be experienced with construction below ground water level. Dewatering should be done from outside the work area and may require the installation of deep well points. The contractor should anticipate that dewatering to a depth of at least 3 feet below the bottom of the excavation or more may be needed.
- 3) Mat foundations should be provided with at least 4 feet of soil cover above their bearing elevation for frost protection.
- 4) Settlement of mat foundations should be generally less than 1-inch total and  $\frac{3}{4}$  inch differential between opposite mat corners.
- 5) The lateral resistance of the mat foundation will be a combination of the sliding resistance of the mat on the fill and passive earth pressure against the sides of the footing. Sliding friction at the bottom of mat foundations may be calculated using a coefficient of friction of 0.3.
- 6) Passive pressure against the sides of the mat may be calculated using the values given for earth pressures in Section 9.0 of this report. Compacted fill placed against the sides of the mat to resist lateral loads may consist of the on-site sands placed in maximum 8-inch thick lifts, moisture conditioned and compacted in accordance with the CDOT Standard Specifications.

- 7) Groundwater should be lowered sufficiently to provide stable conditions prior to and during foundation excavation and concrete placement.
- 8) A representative of this office should observe the foundation excavations prior to concrete placement to confirm suitable bearing conditions.

## 8.2 Spread Footings

The dense natural sands similar to that encountered in our boring, Boring B-2, should be suitable for direct support of spread footings. The bearing elevation for spread footings should be at least 3 feet below the design scour depth. The following design and construction recommendations should be observed for a spread footing foundation system.

- 1) Footings placed on new engineered fill or natural dense, coarse granular soils should be designed for a nominal soil bearing pressure of 9,000 pounds per square foot (psf). A resistance factor of 0.45 should be applied and assumes the use of 1.35 load factor according to LRFD strength limit state methodology. The factored nominal value should be equivalent to a maximum allowable soil bearing pressure of 3,000 psf for Allowable Stress Design (ASD) methodology.
- 2) Spread footings for abutments should be placed on the natural dense to very dense sands or new engineered fill. Any soft or deleterious material encountered in the footing excavations should be removed and replaced with suitable onsite granular material or engineered fill. New fill should be placed in uniform lifts and be compacted to at least 95% of the maximum Modified Proctor density at moisture contents within 2% of optimum, as defined by AASHTO T-180. The bearing surface for spread footings should be compacted with a heavy vibratory roller prior to forming for concrete. This may require that the contractor lower the groundwater level sufficiently to allow for compaction to occur, which can help mitigate liquefaction of the soils and help maintain the stability of the excavation. The contractor should be experienced with construction below ground water level. Dewatering should be done from outside the work area and may require the installation of deep well points. The contractor should anticipate that dewatering to a depth of at least 3 feet below the bottom of the excavation or more may be needed.
- 3) Resistance to sliding for footings supported by the onsite granular soils or new engineered fill may be calculated using a coefficient of friction of 0.57. In accordance with the LRFD methodology, a resistance factor of 0.80 should be applied.
- 4) Settlement of footings designed and constructed as discussed in this section should be less than 1 inch total and  $\frac{3}{4}$  inch differential, and should occur during construction.
- 5) Boulder sized material could create a hard spot and result in differential settlement of footing. Therefore boulders exposed at bearing elevation may need to be removed depending on rock size and potential influence on the footing. This should be evaluated during construction.
- 6) Spread footing foundations should be provided with at least 4 feet of soil cover for frost protection.
- 7) Onsite observation of the bearing materials should be performed by a representative of this office.

### 8.3 DRIVEN H-PILES

Bedrock was encountered in Boring B-2 at a depth of approximately 13½ feet. H-piles driven to refusal in bedrock may be considered for support of the new bridge from a geotechnical perspective. Installation of driven piles should be in accordance with Section 502 "Piling" of the CDOT Standard Specifications and applicable Standard Special Provisions.

- 1) Piles should consist of heavy steel H-sections consisting of Grade A50 steel or higher and be driven to refusal in the underlying bedrock. Refusal criteria should be determined during construction using the Pile Driving Analyzer (PDA) in accordance with Section 502 of the CDOT Standard Specifications.
- 2) H-piles driven to refusal in the underlying bedrock may be designed for the structural capacity of the pile. A combined side shear and end bearing nominal capacity of 38 kips per square inch (ksi) times the cross-sectional area may be used for grade A50 steel. A resistance factor of 0.65 should be applied. The estimated pile tip elevation for the proposed structure is 7,817 feet.
- 3) H-piles are expected to encounter refusal within the upper few feet of bedrock penetration, although some variation in the bedrock surface elevation and penetration should be expected. If pile tip elevations are required to extend into bedrock, pre-drilling will be needed. Pre-drilling should be done in accordance with CDOT specifications, and the contractor should expect that diamond tipped rotary, percussion drilling, coring or other equipment will be needed to predrill the bedrock.
- 4) A large boulder was encountered at a depth of 7 feet in Boring B-2, and similar large boulders were observed at the ground surface. Large boulders may cause refusal to H-pile penetration. If refusal to penetration occurs above the estimated pile tip elevation or in a boulder, then the contractor may need to predrill the pile location to the bedrock surface.
- 5) Settlement of properly constructed driven piles is expected to be nominal, on the order of ½ inch or less.
- 6) Lateral parameters are provided in Section 8.5 "Deep Foundation Lateral Capacity Parameters". Additional resistance to horizontal forces can be provided with battered piles. The vertical and horizontal components of the load will depend on the batter inclinations. Batter should not exceed 1H:4V (horizontal to vertical) inclination.
- 7) Uplift resistance should be limited to the soil/pile interface and side shear friction of the soil starting 4 feet below the scour level and the portion of the pile penetrating bedrock. The side shear friction value should be assumed to start 4 feet below the scour depth and increase linearly from 0 psf to a nominal value of 400 psf at a depth of 10 feet in the natural sands, and remain constant to the bedrock surface. A nominal frictional resistance in the hard to very hard granitic bedrock of 1,500 psf may be assumed. No side shear uplift capacity should be assumed for the section of pile above design scour elevation. A Resistance Factor of 0.35 should be applied to the nominal value for uplift. Pile and pile cap weights may be included in the dead load resistance to uplift forces.
- 8) Pile groups will require an appropriate reduction in axial capacity, based on the effective envelope of the pile group. For axial and uplift, this reduction can be avoided by spacing the piles no closer than 3 diameters from center to center. Piles spaced closer than 3 diameters should be evaluated on an individual basis to establish the appropriate reduction in the design parameters.



- 9) The contractor should submit the equipment proposed for use along with the results of a dynamic wave equation analysis that matches the equipment with the pile blow count related to the pile capacity. During construction, the pile capacity estimated by the wave equation analyses should be confirmed with a Pile Driving Analyzer (PDA) on at least two piles from each abutment.
- 10) The pile driving operations should be observed by Geocal personnel on a full-time basis. Piles should be observed and checked for buckling, crimping, and alignment in addition to recording penetration resistance and general pile driving operations. The observer should be qualified and have a good understanding of the subsurface conditions.

## 8.4 Drilled Shafts

Drilled shafts should be drilled into and supported by the underlying granite bedrock. Some oversized and very hard material, potentially boulder-sized, may be encountered in the overburden soils. These materials may interfere with drilling, casing installation, and shaft construction. A contractor familiar and experienced with these kinds of subsurface conditions should be used. The design and construction criteria presented below should be observed for a drilled shaft foundation system. Installation should be in accordance with Section 503 – Drilled Caissons of the CDOT Standard Specifications.

- 1) Drilled shafts should be designed for the nominal base resistance and side shear resistance values in kips per square foot (ksf) as shown in the following table:

<u>Nominal Base Resistance (ksf)</u>	<u>Nominal Side Shear Resistance (ksf)</u>
101.8	10.2

The above values are for that portion of the shaft in very hard granitic bedrock. The upper 3 feet of bedrock penetration should be neglected to account for weathering. A resistance factor of 0.55 should be applied to the nominal base resistance, 0.55 should be applied for side shear, and 0.40 should be applied for side shear resistance to resist uplift.

- 2) Drilled shafts should penetrate at least 6 feet into very hard bedrock below the scour depth and have a minimum length of at least 17 feet for the capacities presented above in Item 1 to be valid. These are geotechnical parameters. Greater penetration depths may be needed based on the structural requirements.
- 3) Settlement of properly constructed drilled shafts is expected to be on the order of ½ inch.
- 4) The minimum spacing requirements between drilled shafts should be 3 diameters from center to center. At this spacing, no reduction in axial design parameters is required. Drilled shafts grouped less than 3 diameters center to center (B) should be studied on an individual basis to evaluate the appropriate reduction in axial capacity. Article 10.7.3.9 of the AASHTO LRFD Bridge Design Specifications, 8<sup>th</sup> Edition, provides efficiency factors which should be applied to the axial capacity of each individual shaft depending on the center-to-center spacing of the shafts.

- 5) Drilled shaft holes should be properly cleaned prior to placement of reinforcing steel or concrete. A maximum length to diameter ratio of 25 is recommended to facilitate cleaning and observation of the shaft hole.
- 6) Concrete utilized in the drilled shafts should be a fluid mix with sufficient slump so it will fill the voids between reinforcing steel and the shaft hole. Concrete, as specified by the CDOT Standard Specifications, for Class BZ mix is recommended.
- 7) Concrete should be placed in the holes the same day they are drilled. The presence of water will likely require concrete to be placed immediately after the shaft hole is completed. Failure to place concrete the day of drilling will result in degradation of bedrock and a requirement for additional bedrock penetration. The amount of additional bedrock penetration will be a function of how long the hole is left open and whether or not water accumulates during the inactive period. If holes are left open over-night, this office should be contacted for additional bedrock penetration requirements.
- 8) The presence of groundwater and granular soils with potential for caving indicates that casing and/or mud slurry methods will likely be required to help control groundwater and caving. If water cannot be removed prior to placement of concrete, then concrete should be placed using an approved tremie method. The drilling contractor should be aware that water may be encountered in the bedrock as well as the overburden soils. Concrete should be placed after the hole has been well cleaned and approved. In no case should concrete be placed through more than 2 inches of water.
- 9) A sufficient head of concrete should be maintained inside the casing during casing removal to help prevent voids being formed in the concrete. The concrete level should not be allowed to rise during casing removal. If it becomes apparent that voids may have formed during shaft installation, the contractor should be required to perform non-destructive tests, such as sonic echo tests, to evaluate the continuity and integrity of the shaft.
- 10) The drilling contractor should be prepared to encounter large cobbles and boulders within the overburden materials, and the contractor should mobilize equipment of sufficient size, type, and operating condition to penetrate the overburden material and very hard bedrock to achieve the required bedrock penetration. The use of coring bits, rotary, down-hole percussion or other types of drilling may be needed to achieve the required bedrock penetration.
- 11) Bedrock penetration should be measured down from the bottom of the casing or top of hard bedrock, whichever is the lower elevation.
- 12) Cross hole sonic logging is recommended for drilled shafts 3 feet in diameter or greater.
- 13) Installation of drilled shafts should be observed by a representative of this office.

## 8.5 DEEP FOUNDATION LATERAL CAPACITY PARAMETERS

The following recommendations for deep foundations are based on geotechnical design practices. Values presented below should be considered ultimate values and may be used for lateral loading analyses for deep

foundations for the Riverside Drive bridge. Resistance to lateral loads should be assumed zero above the elevation represented by 4 feet below proposed final grade due to potential loss of support from frost penetration, scour, or other shallow ground disturbances. The following recommendations are provided for a lateral capacity analysis using the LPILE Plus 6.0 computer program.

Material Type (p-y Curve Model Type)	Total Unit Weight (pcf)	Cohesion $C_u$ (psf)	Friction angle (deg)	k-static (pci)	k-cyclic (pci)	$\epsilon_{50}$
Artificial Fill (Sand, Reese)	130	--	25	90	--	--
Natural Sand Above Water Table (Sand, Reese)	130	--	30	100	--	--
Natural Sand Below Water Table (Sand, Reese)	125	--	30	60	--	--

The unit weight of water should be subtracted from the total unit weight for the submerged condition.

$\epsilon_{50}$  = strain at 50% of peak strength

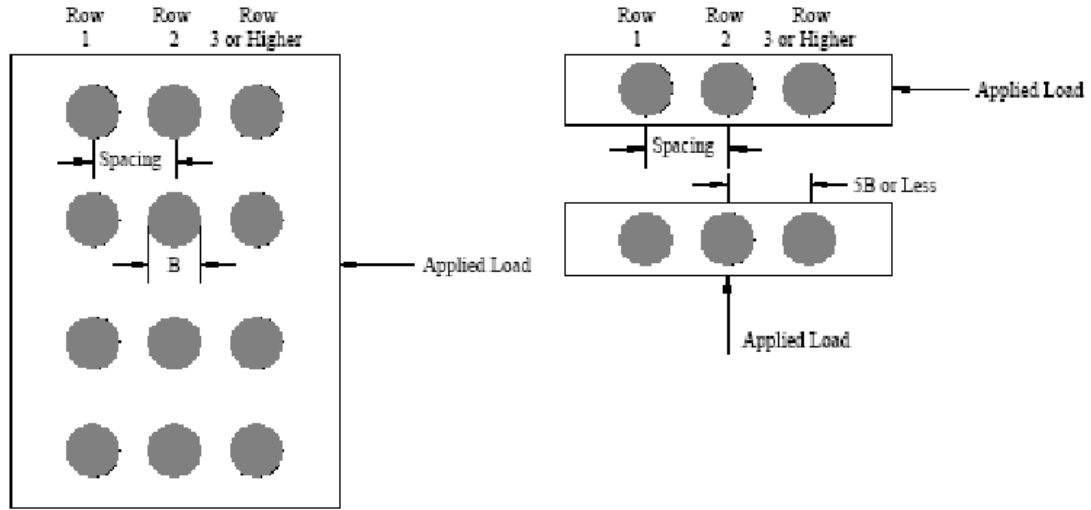
Material Type (p-y curve model type)	Total Unit Weight (pcf)	Uniaxial Compressive Strength (psi)	Friction angle degrees ( $\phi$ )	Initial Mass Modulus (psi)	RQD (%)	krm
Bedrock (Weak Rock, Reese)	145	750	35	550,000	30	0.0005

Reductions in lateral capacity for loading perpendicular to the line of shafts or piles will not be required if center to center spacing of 5 pile diameters or more between adjacent drilled shafts or piles is maintained. LPILE uses p-multipliers to account for reduced capacity of closely spaced drilled shafts or piles for loading in either direction. The following data is from Article 10.7.2.4 of the AASHTO LRFD Bridge Design Specifications, 8<sup>th</sup> Edition Manual. A sketch of the loading and how the rows are referenced is also shown.

#### P-Multipliers for Driven Piles or Drilled Shaft Foundations

Center to Center Spacing in Direction of Loading	p-multiplier for LPILE		
	Row 1	Row 2	Row 3 and Higher
3B	0.80	0.40	0.30
5B	1.00	0.85	0.70

B= Diameter of Shaft or Pile



## 9.0 LATERAL EARTH PRESSURES

Wingwalls and retaining structures which are laterally supported and can be expected to undergo only a slight amount of deflection should be designed for lateral earth pressures based on the "at-rest" earth pressure condition. Cantilevered or gravity retaining structures which rotate and/or deflect sufficiently to mobilize the internal soil strength of the wall backfill may be designed for the "active" earth pressure condition. The following ultimate earth pressure coefficients are recommended for imported CDOT Class 1 Structural Backfill material, as well as the onsite soils.

Material	Active ( $K_a$ )	At-Rest ( $K_0$ )	Passive ( $K_p$ )	$\gamma_T$ – Total Unit Weight (pcf)	$\phi$ – Friction Angle (deg)
Imported Class 1 Structural Backfill	0.28	0.44	3.53	135	34
Onsite Sands	0.33	0.50	3.00	125	30

The above values are for backfill placed and compacted in accordance with the CDOT Standard Specifications, and for the onsite soils at their in-situ condition for lateral earth pressure calculations for walls retaining or embedded in these soils. Fine grained soils (i.e. clays and silts) produce excessive earth pressures on walls and are not recommended for use as structure backfill. For granular backfill, lateral wall movements or rotation equal to 1% of the wall height is typically required to develop the full active case, whereas lateral movement equal to at least 2% of the wall height is required to establish full passive resistance. Suitable factors of safety should be

applied to the above ultimate values to limit strain needed to reach ultimate strength, particularly in the case of passive resistance where large strains are needed to mobilize resistance.

Imported Class 1 Structure Backfill material should meet CDOT Standard Specifications. Onsite sands used as backfill should meet the following gradation:

<u>Sieve Size</u>	<u>Percent Passing (%)</u>
3-inch diameter	100
No. 200	≤ 20

A sufficient number of laboratory tests such as gradation should be performed during construction to confirm that backfill material meets the friction angle requirements. Natural borrow sources often have wider grading variability than plant mixes and will require that more frequent tests be done.

Equivalent fluid unit weights may be taken as follows:

Above groundwater:	$\gamma_{eq}$	=	$\gamma_T \times K_{a,o,p}$
Below groundwater:	$\gamma_{eq}$	=	$(\gamma_T - 62.4) \times K_{a,o,p}$
where:	$\gamma_T$	=	soil total unit weight
	$K_{a,o,p}$	=	appropriate earth pressure coefficient

The above parameters are for a horizontal backfill and no surcharge loading. Retaining structures should be designed for appropriate surcharge pressures such as from traffic, etc. The buildup of water behind a wall or an upward sloping backfill surface will increase the lateral pressure imposed on retaining structures. An underdrain should be provided to help reduce unbalanced hydrostatic pressure buildup unless the wall is designed to accommodate the additional pressure. Care should be taken not to over-compact the backfill or use large equipment adjacent to the wall because this could cause excessive lateral wall loading. Settlement of wall backfill is estimated at approximately 1% to 2% of the total fill height. Most of that settlement should occur during construction assuming CDOT Class 1 Structure Backfill material is used.

## 10.0 SEISMIC DESIGN PARAMETERS

The subsurface conditions encountered at the bridge location generally consisted of sands overlying granite bedrock at a depth of approximately 13½ feet. Based on the American Association of State Highway and

Transportation Officials (AASHTO) 2009 Guide Specifications for LRFD Seismic Bridge Design requirements and considering the amount of overburden soils present and penetration test results, Seismic Site Class C (Very Dense Soil and Soft Rock) should be used for design. The following Site Class C factors should be utilized for design:

<u>Parameter</u>	<u>Value</u>
Approximate Latitude (degrees).....	40.154593
Approximate Longitude (degrees).....	-105.466299
Peak Ground Acceleration (PGA).....	0.067 g
Spectral Acceleration Coefficient at 0.2 Second Period ( $S_s$ ).....	0.140 g
Spectral Acceleration Coefficient at 1.0 Second Period ( $S_1$ ).....	0.036 g
Site Factor ( $F_{PGA}$ ).....	1.2
Site Factor ( $F_a$ ).....	1.2
Site Factor ( $F_v$ ).....	1.7
Modified Peak Ground Acceleration ( $A_s$ ).....	0.080 g
Modified Spectral Acceleration Coefficient at 0.2 Second Period ( $S_{DS}$ )..	0.168 g
Modified Spectral Acceleration Coefficient at 1.0 Second Period ( $S_{D1}$ )..	0.060 g

## 11.0 UNDERDRAIN SYSTEM

Below grade structures (wingwalls) should be provided with an underdrain system which will help prevent buildup of hydrostatic pressure. The underdrain system should consist of a perforated PVC pipe surrounded by free draining granular material placed at the bottom of the wall backfill and sloped at a minimum 2% grade to a suitable gravity outlet. Free draining granular material used in the drain system should conform to the requirements for Class B filter material as specified in the CDOT Standard Specifications. Animal guards should be considered for use at the pipe outlets.

## 12.0 SITE GRADING AND EXCAVATIONS

The onsite soils encountered generally consist of sands with variable amounts of silt and gravel. Based on the boring and site observations, there is the potential for some cobbles and boulders to exist within the overburden soils. Excavation of the onsite soils should be possible with conventional heavy-duty equipment. The re-use of onsite materials will be a function of where the material is taken from and what the intended use is. Existing

vegetation, debris, and deleterious materials should be stripped and removed from all proposed pavement and fill areas. Exposed surfaces should be free of mounds and depressions which could prevent uniform compaction. Fill should be placed and compacted according to CDOT Standard Specifications (compacted to a minimum 95% of Modified Proctor (AASHTO T-180) within  $\pm 2\%$  of optimum moisture content). The existing onsite, granular, non-expansive soils should be suitable for use as engineered fill for support of pavements, foundations, and for common embankments. If encountered, oversized material (greater than 3 inches) should be omitted as engineered fill. Structure backfill materials meeting CDOT Class 1 grading may need to be imported, although some of the onsite granular soils may meet the CDOT Class 1 specification.

Permanent fill slopes up to 15 feet high should be constructed no steeper than 3:1 (horizontal to vertical) grade provided the fills are properly compacted and drained. The ground surface underlying proposed fills should be carefully prepared by removing all organic matter and oversized material (greater than 6 inches maximum dimension), scarifying to a depth of 8 inches, and re-compacted in accordance with the CDOT Standard Specifications. Settlement of properly compacted embankments constructed of material similar to that encountered onsite should be on the order of 1% to 2% of the embankment height (depending on the embankment materials used) and should occur during construction.

Proper surface drainage should be provided around all permanent cuts to direct surface runoff away from the cut face. Cut slopes and other stripped areas should be protected against erosion by re-vegetation or other methods. Permanent cut slopes up to 10 feet high should be possible provided the slopes do not exceed 3 horizontal to 1 vertical (3H:1V), and provided that seepage is not encountered. No formal stability analyses were performed to evaluate the slopes recommended above. Published literature and our experience with similar cuts and fills indicate the recommended slopes have adequate factors of safety. If seepage is encountered, we should be advised for further evaluations.

Excavations are particularly susceptible to localized instabilities if seepage is encountered, and the contractor should be aware of potential groundwater, excavation stability, and safety for workers. Sloped excavations should conform to applicable OSHA regulations, and the contractor should assume responsibility for excavations that are safe for workers.

**Dewatering:** Groundwater was encountered at an approximate depth of 7 feet below existing grade. Depending on the depth of excavation, seasonal conditions, and water level in Cave Creek, groundwater may be encountered in the excavations. If excavations are conducted during the spring and early summer months, seasonal runoff may rapidly increase the groundwater elevations and the contractor may need to be prepared with sufficient

equipment to accommodate a rapid rise of groundwater. The contractor should anticipate that groundwater flow rates into excavations that are below the groundwater level will be high, and that the material could be flowing. The contractor may need to install appropriate well points on either side of the excavation to maintain stability.

## 13.0 PAVEMENT DESIGN RECOMMENDATIONS

A pavement section is a layered system designed to distribute concentrated traffic loads to the subgrade without overstressing the subgrade soils. Performance of the pavement structure is a function of a number of factors including, but not limited to, the physical properties of the subgrade soils, drainage, and traffic loading. The pavement section presented in this section for Riverside Drive is based on the Boulder County Multimodal Transportation Standards, 2012 pavement design procedures. Hot Mix Asphalt Pavement (HMAP) pavement thickness sections were calculated using WinPAS 12 computer software, based on the AASHTO 1993 Pavement Design methodology. Printouts are included in Appendix B.

**Subgrade Soil Strength:** Laboratory test results indicate an R-value of 64 for the sample of silty sand collected from Boring B-2. For design, an R-value of 40 was assumed to account for subgrade variability.

The following design parameters were used for the pavement design:

<u>General</u>	<u>Value</u>
Initial Serviceability	4.5
Terminal Serviceability	2.0
Reliability Level	90%
Overall Standard Deviation	0.44
<u>Soils</u>	
R-Value	40
Resilient Modulus	9,497 psi
<u>Asphalt</u>	
Structural Coefficient, HMAP	0.44
Structural Coefficient, Class 6 Aggregate Base Course (ABC)	0.12
Drainage Coefficient	1.0

**Traffic Loading and ESAL Calculations:** The 18-kip Equivalent Single Axle Load (ESAL) is the equivalent 18,000-pound single axle loading for different vehicle types, and the design period ESALs is the total equivalent



loading applied to the pavement for the design period. The flexible pavement thickness calculation is based on a 20-year design life. The design ESAL calculations were based on the traffic information in the 2018 Structure Inspection Report prepared by SEH, Inc. The Bridge Inspection Report provided a 2014 average daily traffic count (ADT) of 90 vehicles per day (vpd), a future 2034 ADT of 152 vpd, and 4% truck traffic. We assumed that the improvements would be completed, and the roadway put into service in 2020. We calculated a 2.7% annual growth rate and a 20-year design ADT of 141 vpd.

We assumed that construction would be complete, and the bridge would be put into service in 2020. We also assumed a truck traffic distribution of 2.0% single unit trucks and 2.0% combination units. A design lane factor of 60% was applied, based on our understanding that Riverside Drive will remain a two-lane roadway. A 20-year design ESAL of 19,329 was calculated. A copy of the ESAL calculations is provided in Appendix B.

**Pavement Thickness Recommendations:** The pavement sections presented in this section were calculated using AASHTO procedures and the WinPAS 12 computer modeling software. The calculated composite pavement section (HMAP over ABC) is summarized in the following table.

Pavement Section	Thickness of New HMAP (inches)	Thickness of New ABC (inches)
HMAP over ABC	3	4

The calculated pavement section is less than the pavement section encountered in the exploratory boring. Alternatively, matching the existing pavement section would be acceptable. A functional overlay (mill at least 2 inches of the existing asphalt and replace with new asphalt), may be considered for the transitional zone between the new pavements and the existing pavements. Functional overlays provide temporary ride quality improvements with a minimal extension of the design life. Pavement design software printouts are included in Appendix B.

**Hot Mix Asphalt Pavement (HMAP):** HMAP materials should consist of a bituminous plant mix composed of a mixture of aggregate and bituminous material that meets the requirements of a job-mix formula established by a qualified engineer. Grading type SX (50) and binder grade PG 64-22 are recommended for all HMAP lifts for this project. Grading SX has a nominal ½ aggregate gradation and may help reduce surface water penetration and oxidation of the HMA surface, which in turn may help reduce long-term maintenance.

**Aggregate Base Course (ABC):** ABC material should meet the CDOT Standard Specifications for Class 6 aggregate base course and have a minimum R-value of 78. The material should be placed and compacted in accordance with the CDOT Standard Specifications.

**Subgrade Preparation:** The onsite soils should be predominantly granular and should be suitable for pavement support. In the area of new roadway reconstruction, the subgrade should be uniformly scarified to at least 8 inches and compacted to at least 95% of the maximum standard Proctor dry density at moisture contents within 2% of optimum. Areas that are noticeably dry should be moisture conditioned and recompact. Any otherwise unsuitable materials should be removed and wasted. Engineered fill placed to support new pavements should be non-expansive, granular, and have minimum R-value of 40. The engineered fill should be moisture conditioned and compacted per CDOT Standard Specifications. The contractor should anticipate subgrade conditions that vary from optimum moisture, and the addition of water or drying of the subgrade soils to achieve proper moisture conditions may be needed.

**Proof-Roll:** Prior to paving, the subgrade should be proof-rolled in accordance with Section 203.09 of the CDOT Standard Specifications. Areas of the subgrade that rut or deflect excessively under the wheel loads should be stabilized prior to paving. Proof-rolled areas should be paved within 48 hours unless affected by precipitation, construction traffic, or otherwise disturbed, in which case the area should be repaired and proof-rolled again.

**Drainage, Frost Potential, and Utilities:** The collection and diversion of surface drainage away from paved areas is extremely important for the satisfactory performance of the pavement. The design of surface drainage should be carefully considered to remove all water from the roadway paved areas. Groundwater was encountered during drilling; however, the soils are granular, and a separate pavement subsurface drain should not be needed. The predominant soil types are silty sands with gravel that are moderately susceptible to frost heave. However, frost heave potential may be reduced with proper surface drainage and construction control. Major utilities, such as gas, water, and sewer should be placed prior to paving. Trench backfill should be properly placed and compacted to reduce differential settlement and subsequent distress to the pavement structure.

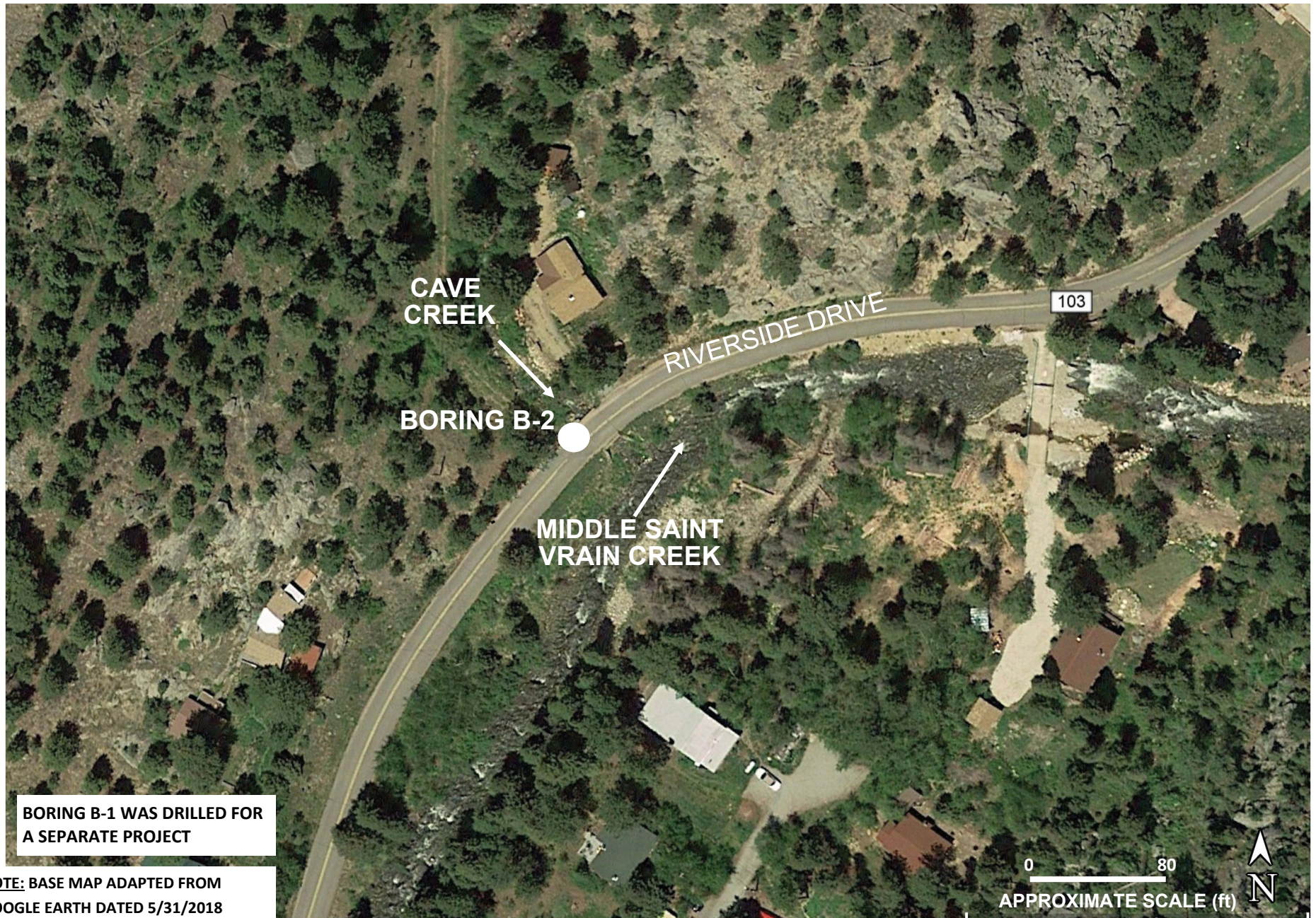
**Maintenance:** Periodic maintenance of paved areas will extend pavement life. Crack sealing should be performed on a frequent basis as new cracks appear. Chip seals, fog seals, or slurry seals applied at approximate 3 year to 5-year intervals will help reduce oxidative embrittlement problems associated with asphalt pavements. As conditions warrant, it may be necessary to perform full depth patching, milling, and overlays at approximate 10 year intervals or more frequently.

## 14.0 LIMITATIONS

This report has been prepared in accordance with generally accepted geotechnical engineering practices used in this area and has been prepared for design purposes. The conclusions and recommendations are based upon the data obtained from the boring drilled at the approximate location shown on Figure 1 and the proposed construction. The nature and extent of the variations between the borings may not become evident until excavation is performed. If during construction, soil, bedrock, fill, or groundwater conditions appear to be different from those described, this office should be advised so that re-evaluation of our recommendations may be made. Onsite observation of foundation bearing materials and testing of fill placement by a representative of this office are recommended.

Our professional services were performed using that degree of care and skill ordinarily exercised, under similar circumstances, by reputable geotechnical engineers practicing in this or similar localities, at the time this report was prepared. No warranty, expressed or implied, is made. We prepared the report as an aid in design of the proposed project. This report is not a bidding document. Any contractor reviewing this report must draw his or her own conclusions regarding site conditions and specific construction techniques to be used.

Explorations into the occurrence or potential occurrence of hazardous materials, or other environmental assessments that may be applicable to the site are beyond the scope of services represented by this report.



**BORING B-1 WAS DRILLED FOR A SEPARATE PROJECT**

**NOTE: BASE MAP ADAPTED FROM GOOGLE EARTH DATED 5/31/2018**

**GEOCAL PROJECT NO.**  
G18.1853.000

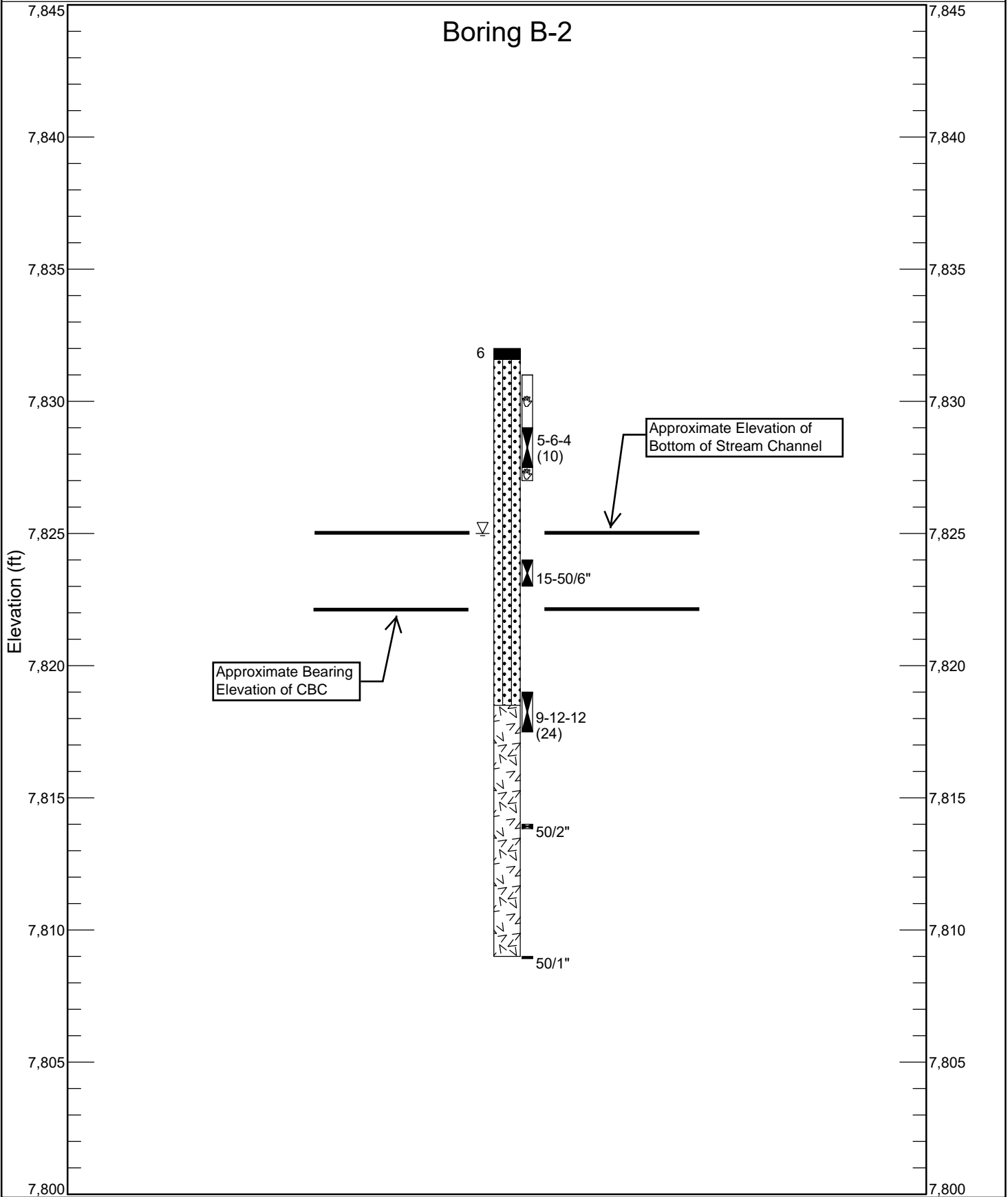


**BOULDER COUNTY MINOR STRUCTURES  
LOCATIONS OF EXPLORATORY BORINGS**

**FIGURE 1**

CLIENT SEH Inc. PROJECT NAME Boulder County Minor Structures Replacements  
 PROJECT NUMBER G18.1853.000 PROJECT LOCATION Boulder County




STRATIGRAPHY & GW - D (8-1/2 X 11 VERT) - GINT STD US LAB.GDT - 12/11/20 16:08 - WAENGINEERING\CLIENTS\SEH INC\2019 PROJECTS\BOULDER COUNTY BRIDGES\GINT\BOULDER COUNTY BRIDGES.GPJ







CLIENT SEH Inc. PROJECT NAME Boulder County Minor Structures Replacements  
 PROJECT NUMBER G18.1853.000 PROJECT LOCATION Boulder County

**LITHOLOGIC SYMBOLS**

*(Unified Soil Classification System)*

- 5  ASPHALT, thickness in inches to left of log
-  SILTY SAND, SILTY SAND with GRAVEL (SM)
-  GRANITE BEDROCK, hard to very hard, weathered in top 5 feet

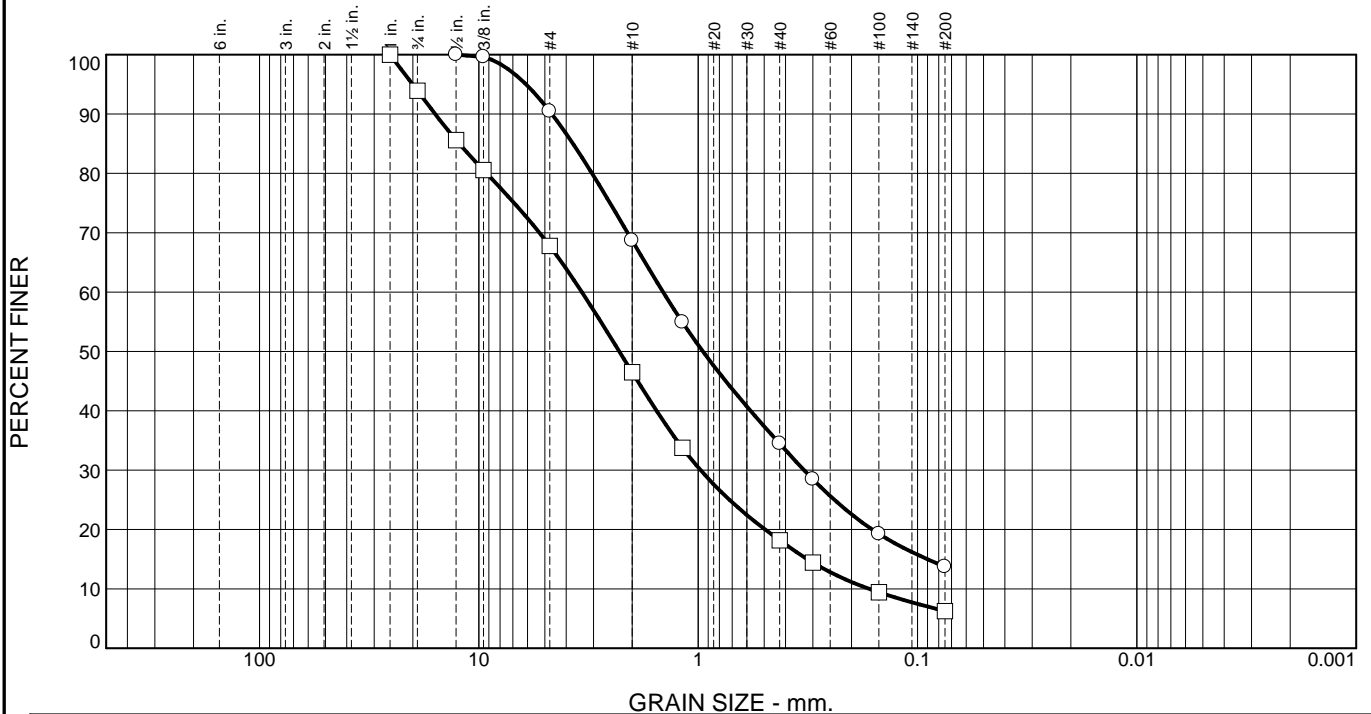
**SAMPLER SYMBOLS**

-  Grab Sample
-  Modified California Sampler
-  Standard Penetration Test
- 50/2" The symbol 50/2" indicates that 50 blows from a 140-pound hammer were required to drive a Modified California Sampler 2 inches.
- 5-6-4 (10) The symbol (10) indicates that 10 blows from a 140-pound hammer were required to drive an SPT Sampler 12 inches.
-  Groundwater Level at Time of Drilling

**NOTES**

- 1) Borings were drilled with a truck-mounted drill rig equipped with ODEX.
- 2) Locations of borings shown on Figure 1 are approximate.
- 3) The lines between strata represent approximate boundaries between material types. Transitions between materials may actually be gradual.
- 4) Fluctuations in the water level may occur with time.
- 5) Borings are drawn to elevation estimated from US Geological Survey Raymond quadrangle (2016): NGA Ref No. USGSX24K37204.

# Gradation Test Results



	% +3"	% Gravel	% Sand		% Fines					
			Coarse	Fine	Silt	Clay				
<input type="radio"/>	0	31	35	20	14					
<input type="checkbox"/>	0	54	28	12	6					
<input type="checkbox"/>	<b>LL</b>	<b>PL</b>	<b>D85</b>	<b>D60</b>	<b>D50</b>	<b>D30</b>	<b>D15</b>	<b>D10</b>	<b>C<sub>c</sub></b>	<b>C<sub>u</sub></b>
<input type="radio"/>	NV	NP	3.7240	1.4452	0.9515	0.3292	0.0901			
<input type="checkbox"/>	NV	NP	12.2953	3.3912	2.2895	0.9749	0.3180	0.1662	1.69	20.41

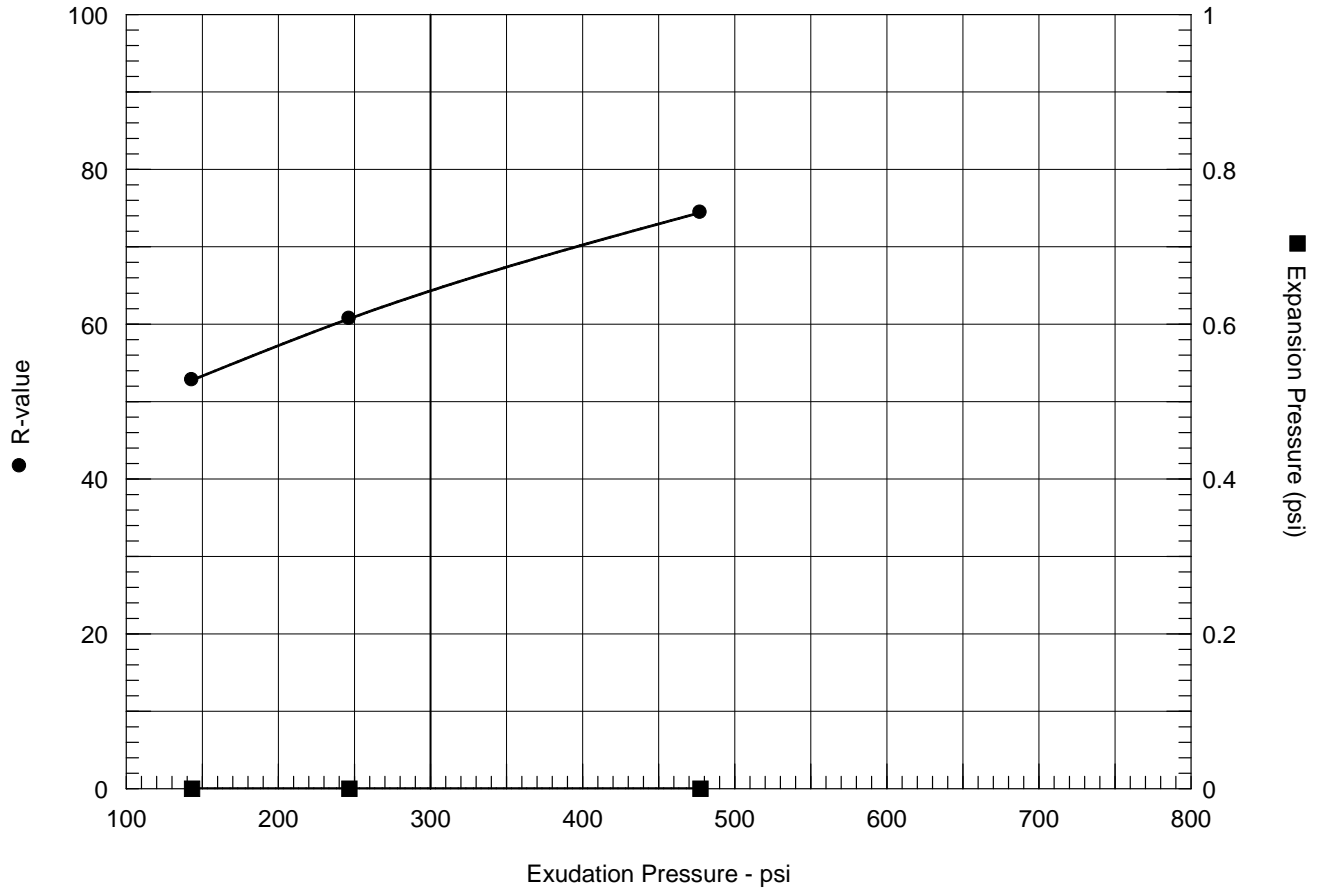
Material Description	USCS	AASHTO
<input type="radio"/> silty sand	SM	A-1-b
<input type="checkbox"/> well-graded sand with silt and gravel	SW-SM	A-1-a

**Project No.** G18.1853.000 **Client:** SEH  
**Project:** Boulder County Minor Structures Replacement Riverside Dr.  
 **Location:** Boring B-2      **Depth:** 1-5 feet      **Sample Number:** 8352-4  
 **Location:** Boring B-2      **Depth:** 13 feet      **Sample Number:** 8352-5

**Remarks:**

**GEOCAL, INC.**

# R-VALUE TEST REPORT



**Resistance R-Value and Expansion Pressure - AASHTO T 190**

No.	Compact. Pressure psi	Density pcf	Moist. %	Expansion Pressure psi	Horizontal Press. psi @ 160 psi	Sample Height in.	Exud. Pressure psi	R Value	R Value Corr.
1	350	123.7	8.0	0.00	28	2.50	477	74	74
2	300	124.6	9.1	0.00	34	2.44	247	62	61
3	230	126.2	9.1	0.00	36	2.40	143	55	53

Test Results	Material Description
<p>R-value at 300 psi exudation pressure = 64</p> <p>Exp. pressure at 300 psi exudation pressure = 0.00 psi</p>	silty sand
<p><b>Project No.:</b> G18.1853.000</p> <p><b>Project:</b> Boulder County Minor Structures Replacement Riverside Dr.</p> <p><b>Location:</b> Boring B-2</p> <p><b>Sample Number:</b> 8352-4      <b>Depth:</b> 1-5 feet</p> <p><b>Date:</b> 11/30/2020</p>	<p><b>Tested by:</b> D.Houston</p> <p><b>Checked by:</b> M.Wegelin</p> <p><b>Remarks:</b></p>
<p><b>R-VALUE TEST REPORT</b></p> <p><b>GEOCAL, INC.</b></p>	

**Figure 5**





# APPENDIX A

INDIVIDUAL LOG OF EXPLORATORY BORING

<b>CLIENT</b> <u>SEH Inc.</u>	<b>PROJECT NAME</b> <u>Boulder County Minor Structures Replacements</u>
<b>PROJECT NUMBER</b> <u>G18.1853.000</u>	<b>PROJECT LOCATION</b> <u>Boulder County</u>
<b>DATE STARTED</b> <u>7/3/19</u> <b>COMPLETED</b> <u>7/3/19</u>	<b>GROUND ELEVATION</b> <u>7832 ft</u> <b>NORTH</b> _____
<b>DRILLING CONTRACTOR</b> <u>Elite Drilling Services</u>	<b>GROUND WATER LEVELS:</b> <b>EAST</b> _____
<b>DRILLING METHOD</b> <u>ODEX</u> <b>HOLE SIZE</b> <u>4 inches</u>	▽ <b>AT TIME OF DRILLING</b> <u>7.00 ft / Elev 7825.00 ft</u>
<b>LOGGED BY</b> <u>Ani Galvan</u> <b>CHECKED BY</b> <u>Nur Hossain</u>	<b>AT END OF DRILLING</b> <u>---</u>
<b>NOTES</b> <u>Riverside Drive at Cave Creek, Westbound/Center, West Abutment</u>	<b>AFTER DRILLING</b> <u>---</u>

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	UNCONFINED COMP. STRENGTH (psf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)	% Swell (+) or Consol (-)/ Swell Pressure (psf)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX		
0	ASPHALT PAVEMENT, 5 inches thick												
0 - 7	(SM) SILTY SAND (SM), loose to dense, slightly moist to wet, grayish-brown, mostly fine to medium sand, some coarse sand, few fine to coarse gravel, grades coarser with depth, approximately 2-foot thick boulder at 7 feet depth, clayey layer at 13.5 feet		GB						NP	NP	NP	14	
5	▽		SPT	6	5-6-4 (10)								
10			SPT	17	15-50/6"								
15	GRANITE BEDROCK, hard to very hard, slightly moist, light gray, stratified, moderately to heavily weathered in the top 5 feet, degree of weathering decreases with depth, possible fault at approximately 20 feet		SPT	44	9-12-12 (24)			13.9	NP	NP	NP	6	
20			MC	25	50/2"								
Bottom of boring at 23.0 feet.			MC	0	50/1"								

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# APPENDIX B

ESAL CALCULATIONS  
PAVEMENT DESIGN CALCULATIONS

# Design Lane ESAL Calculations

Geocal design based on available information

Riverside Drive at Cave Creek	Vehicle Type/Classification (%)			
	Cars & Pickups	Single Unit Trucks	Combination Unit Trucks	
Vehicle Type Load Factor (Flexible Pavement)	0.003	0.249	1.087	
Assumed Growth Rate = 2.7				
Number of Lanes (per direction) = 1		% in Design Lane= 60%		
<i>Percent of types</i>	<i>100.00%</i>	<i>96.00%</i>	<i>2.00%</i>	<i>2.00%</i>
2014 ADT (from Bridge Inspection Report)	90	86	2	2
Projected 2020 ADT	109	105	2	2
2034 ADT (from Bridge Inspection Report)	152	146	3	3
Projected 2040 ADT	171	164	3	3
20-Yr Design ADT	141	135	3	3
Roadway ESAL	32,215	2,957	5,453	23,805
Design Lane ESAL <sub>20</sub>	<i>19,329</i>			

# WinPAS

Pavement Thickness Design According to  
**1993 AASHTO Guide for Design of Pavements Structures**  
American Concrete Pavement Association

## Flexible Design Inputs

Project Name: Boulder County Minor Structures Replacement  
Route: Riverside Drive at Cave Creek  
Location:  
Owner/Agency: Boulder County  
Design Engineer:

## Flexible Pavement Design/Evaluation

<b>Structural Number</b>	1.62	<b>Subgrade Resilient Modulus</b>	9,497.00 psi
<b>Total Flexible ESALs</b>	20,000	<b>Initial Serviceability</b>	4.50
<b>Reliability</b>	90.00 percent	<b>Terminal Serviceability</b>	2.00
<b>Overall Standard Deviation</b>	0.44		

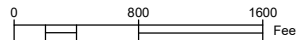
## Layer Pavement Design/Evaluation

Layer Material	Layer Coefficient	Drainage Coefficient	Layer Thickness	Layer SN
Asphalt Cement Concrete	0.44	1.00	2.59	1.14
Graded Stone Base	0.12	1.00	4.00	0.48
			$\Sigma$ SN	1.62

# Minor Structures Replacement Design Riverside Drive at Cave Creek SUE Utility Map





**PROJECT LOCATION MAP**



<u>SHEET NO.</u>	<u>INDEX OF SHEETS</u>
1	TITLE SHEET
2	GENERAL NOTES AND MAP KEY
3	PLAN UTILITY DRAWING



Print Date: 8/5/2019		<table border="1"> <thead> <tr> <th colspan="3">Sheet Revisions</th> </tr> <tr> <th>Date:</th> <th>Comments</th> <th>Init.</th> </tr> </thead> <tbody> <tr> <td>8/5/19</td> <td>Original</td> <td>ZW</td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>			Sheet Revisions			Date:	Comments	Init.	8/5/19	Original	ZW										 <p>Boulder County Transportation Department 2525 13th Street Suite #203 Boulder, Colorado 80304</p>		Project No./Code	
Sheet Revisions																										
Date:	Comments	Init.																								
8/5/19	Original	ZW																								
File Name: Riverside Drive_SUE_Exit.dwg Horiz. Scale: 1"=800'      Horiz. Scale: As Noted Unit Information      Unit Leader: k3@msj		 UTILITY MAPPING SERVICES 15065 W. 44th Ave Golden, CO 80403 (406)933-5300		Sheet Number      1																						

**Survey Information:**

This plan set shows subsurface and aerial utilities as of July 2019 and are subject to change. The engineering survey of the surface features and field delineated buried utilities was completed by UMS, Inc personnel. Boulder County Transportation Department approved survey control was used to tie all survey data to the project coordinate system. The transcription of survey data to the CADD plans was completed by UMS, Inc.

**Subsurface Utility Engineering (SUE) Notes:**

For this project, UMS Inc. was responsible for the field designating of the existing buried utilities to the extent practical and as detailed in the authorized scope of work for this project. Users of this data set must understand and adhere to the limitations associated with the designated Quality Levels assigned to the depicted facilities. UMS, Inc. recommends that vacuum excavations or other nondestructive methods are used to obtain 3D data on utilities in potential conflict with proposed design and construction. UMS, Inc. strongly recommends users of this data become orientated with the CI/ASCE 38-02 standard guidelines and the corresponding data limitations inferred by the designated Quality Levels prior to employing the data set for design purposes. In addition, the SUE report(s) for this project must always accompany the existing utility reference CADD file to ensure proper interpretation and usage of the data set.

**SUE Quality Levels:**

SUE Phase I (Designating) and Phase II (Locating) activities allow for the assignment of CI/ASCE 38-02 "Quality Levels" to the mapped underground utilities. The following four Quality Levels are used to identify the degree of accuracy to which the utilities are mapped: Quality Level D (QL D): Information derived from existing records and/or oral recollections. This information is adequate for rudimentary planning or background purposes only. Quality Level C (QL C): Information obtained by surveying and plotting visible above ground utility features and by using professional judgment in correlating this information to QL D data. Use of this information alone may result in 15 - 30% of underground utilities omitted or mapped with more than two feet of error, according to FHWA studies. Quality Level B (QL B): Information obtained through the application of appropriate surface geophysical methods to determine the existence and approximate horizontal position of subsurface utilities. QL B data should be reproducible by surface geophysics at any point of their depiction. This information is surveyed to applicable tolerances defined by the work scope and reduced onto plan documents. Quality Level A (QL A): Precise horizontal and vertical location of utilities obtained by the actual exposure (or verification of previously exposed and surveyed utilities) and subsequent measurement of the subsurface utility at a specific point. Vacuum excavation equipment is typically used to minimize the potential for utility damage. A precise horizontal and vertical location as well as other utility attributes are shown on plan documents. Note - QL B results (the position of the designating marks (i.e. paint)) can be influenced by factors beyond UMS's control, such as conductivity of materials and their surroundings, moisture, proximity of other underground utilities or structures, utility depth, etc.

**Disclaimer:**

A possibility exists that abandoned, forgotten, non-detectable, undocumented or newly installed utilities may not get mapped using standard geophysical survey procedures. This information is for design purposes only. Markings placed on the ground by UMS personnel are not intended to be used for excavation purposes. The use of this information by others does not relieve a contractor from the duty to comply with applicable utility prevention damage laws and regulations, including but not limited to, giving notifications to utility owners or "One Call / Call Before You Dig (811)" prior to construction. Refer to ASCE/CI 38-02 Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data for more detailed information and descriptions regarding the SUE process.

- \* All UMS survey information obtained during the SUE investigation is based on an Engineering Survey.
- \*\* Unless otherwise noted, all aerial installation depictions are based on surveyed pole locations and apparent cable/conductor connectivity as observed and logged by UMS field crews.

**UTILITY CONTACT LIST**

Utility	Utility Type	Contact	Telephone/Email
CenturyLink	Telephone	Gary Colebank	303-707-3599
			gary.colebank@centurylink.com
Boulder County	Storm	Jave Webster	720-564-2660
			dwebster@bouldercounty.org
Xcel Energy Distribution	Electric	Gary D. Motsinger	303-571-3186
			gary.d.motsinger@xcelenergy.com

**LEGEND**

- OH — EXISTING OVERHEAD POWER LINE
- COM — EXISTING BURIED COMMUNICATION LINE
- EXISTING BURIED STORM LINE
- ⊗ POWER POLE
- ☐ TELEPHONE PEDESTAL
- ✓ STORM CULVERT
- ↓ GUY WIRE ANCHOR

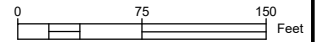
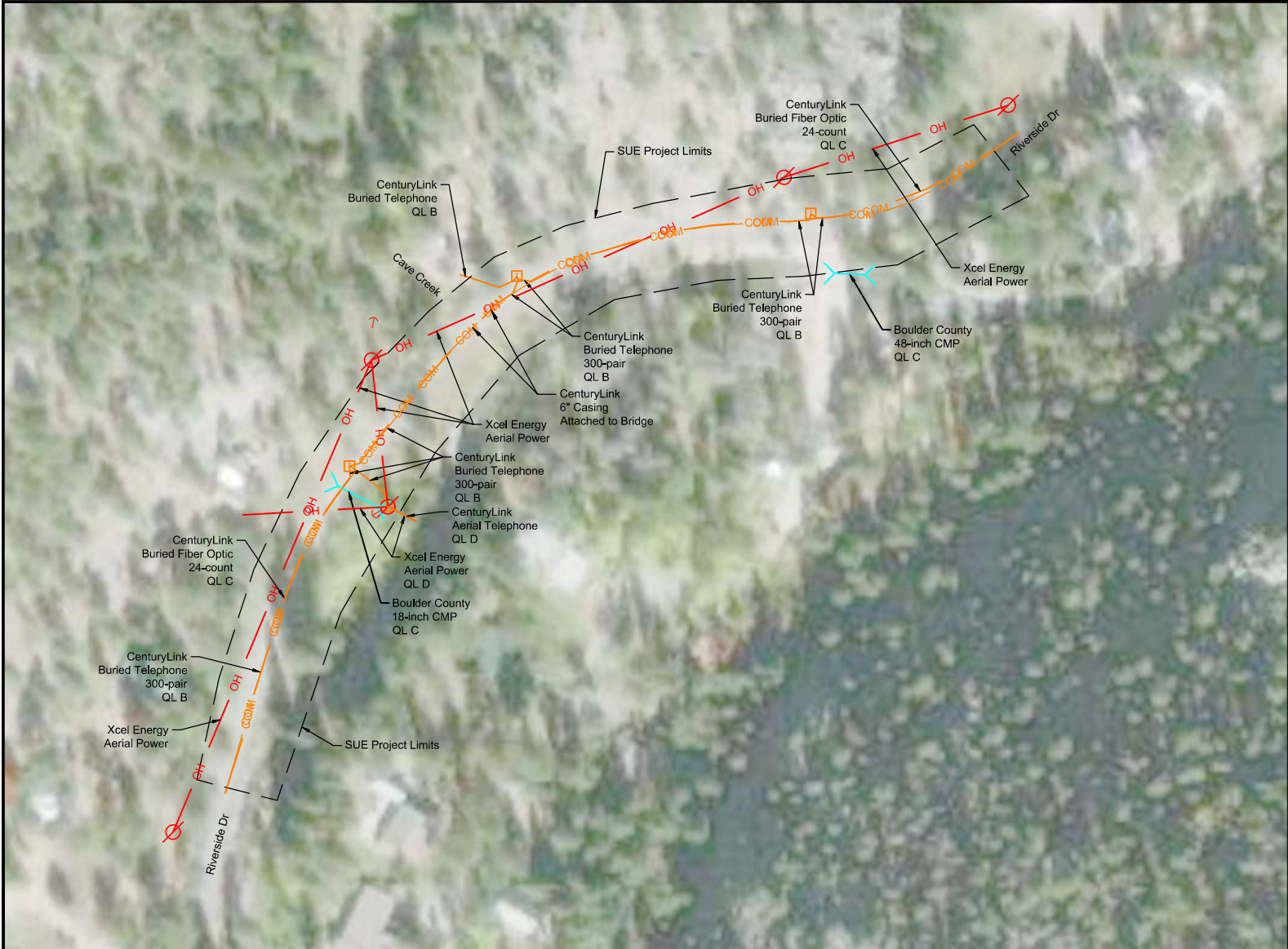
**EQUIPMENT USED**

Radiodetection RD8000 Cable Locator  
 Trimble TSC7 Data Collector  
 Trimble R10 GNSS System



Print Date: 8/5/2019 File Name: Riverside Drive_SUE_Exit1.dwg Horiz. Scale: NA Unit Information: Unit Leader: HJH/als		<b>Sheet Revisions</b>			Boulder County Transportation Department 2525 13th Street Suite #203 Boulder, Colorado 80304	Project No./Code	
Horiz. Scale: As Noted		Date: 8/5/19	Comments: Original	Init.: ZW		Sheet Number 2	
UMS UTILITY MAPPING SERVICES 15065 W. 44th Ave Golden, CO 80403 (406)933-5300		( )	( )	( )		( )	
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Print Date: 8/5/2019	
File Name: Riverside Drive_SUE_Exit.dwg	
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