COLORADO DEPARTMENT OF TRANSPORTATION
SH 92 Stengel's Hill

The 2011 Standard Specifications for Road and Bridge Construction controls construction of this Project. The following technical requirements supersede and take precedence over the Standard Specifications.

Instructions to Proposers and Notice to Bidders	(January 16, 2014)
Technical Requirements – Section 1 – General	(January 16, 2014)
Technical Requirements – Section 1 – General – Project Special Provisions	(January 16, 2014)
Technical Requirements – Section 2 – Project Management	(January 16, 2014)
Technical Requirements – Section 2 – Project Management Project Special Provision	(January 16, 2014)
Technical Requirements – Section 3 – Quality Management	(January 16, 2014)
Technical Requirements – Section 3 – Quality Management Project Special Provision	(January 16, 2014)
Technical Requirements – Section 4 – Public Information	(January 16, 2014)
Technical Requirements – Section 5 – Environmental Requirements	(January 16, 2014)
Technical Requirements – Section 5 – Environmental Requirements Project Special Provisions	(January 16, 2014)
Technical Requirements – Section 6 – Third Party Agreements	(January 16, 2014)
Technical Requirements – Section 7 – Utilities	(January 16, 2014)
Technical Requirements – Section 7 – Project Special Provision	(January 16, 2014)
Technical Requirements – Section 8 – Right-of-Way	(January 16, 2014)
Technical Requirements – Section 9 – Survey	(January 16, 2014)
Technical Requirements – Section 9 – Project Special Provision	(January 16, 2014)
Technical Requirements – Section 10 – Geotechnical and Roadway Pavements	(January 16, 2014)
Technical Requirements – Section 10 – Geotechnical and Roadway Pavements Project Special Provisions	(January 16, 2014)
Technical Requirements – Section 11 – Earthwork	(January 16, 2014)
Technical Requirements – Section 11 – Earthwork – Project Special Provisions	(January 16, 2014)
Technical Requirements – Section 12 – Hydraulics	(January 16, 2014)
Technical Requirements – Section 13 – Roadway Design	(January 16, 2014)
Technical Requirements – Section 13 – Roadway Design – Project Special Provision	(January 16, 2014)
Technical Requirements – Section 14 – Signing, Pavement Marking, Lighting	(January 16, 2014)
Technical Requirements – Section 15 – Structures	(January 16, 2014)
Technical Requirements – Section 15 – Structures Project Special Provisions	(January 16, 2014)
Technical Requirements – Section 16 – Maintenance of Traffic	(January 16, 2014)
Technical Requirements – Section 16 – Maintenance of Traffic – Project Special Provisions	(January 16, 2014)
Technical Requirements – Section 17 – Landscaping	(January 16, 2014)

Technical Requirements – Section 17 – Landscaping – Project Special Provisions	(January 16, 2014)
Technical Requirements – Section 18 – Maintenance During Construction	(January 16, 2014)
Technical Requirements – Section 19 – Modifications to Standard Specifications	(January 16, 2014)

Forms:

Form A – Key Project Personnel Information
Form B – Design Firm Prequalification

Contract Documents

01-ROW Plans
02-ROW_Model (dgn file)
03-ROW_Executed Memorandum of Agreements (MOAs)
04-Standard Special Provisions

Reference Documents

01-General Plan Sheets
02-Utility Plans
03-Demolition/Plan and Profile Sheets
04-Structure Plans
05-Survey Plans
06-Drainage Plans
07-SWMP/Erosion Control Plans
08-Phasing/Traffic Control Plans
09-Pavement Markings/Signing Plans
10-Cross Sections
11-Drainage Report
12-Geotech Reports
13-Pavement Recommendation Letter
14-Structure Selection Report Bridge
15-Structure Selection Report Walls
16-DES_Model File (dgn file)
17-DES_Alignment File (dgn file)
18-BRDG_Model File (dgn file)
19-BRDG_Wall File (dgn file)
20-HYDR_Model File (dgn File
21-TRAF_Model File (dgn file)
22-UTIL_Model_Proposed File (dgn file)
23-SURV_Model_Planimetrics File (dgn file)
24-SURV_Model_Contours File (dgn file)
25-SURV_Model_Codes File (dgn file)
26-SURV_Model_Elevations File (dgn file)
27-SURV_Model_Names File (dgn file)

28-SURV_Model_Notes File (dgn file)
29-SURV_Model_Symbols File (dgn file)
30-SURV_Model_Previous Construction File (dgn file)
31-SH92_Stengels Hill Alignment File (Inroads file)
32-SH92_Existing Digital Terrain Model (Inroads file)
33-Wetland Finding
34-Wetland Delineation Report
35-SB 40 Memorandum of Agreement
36-SB 40 Application
37-SB 40 Guidelines
38-404 Permit Report
39-404 Permit
40-UPRR Draft C&M Agreement
41-UPRR Right of Entry Application
42-UPRR Conceptual Submittal
43-UPRR Conceptual Submittal Comments
44-UPRR 30% Comments (2/1/13)
45-UPRR 30% Comments (4/16/13)
46-UPRR Response to Comments
47-UPRR Grade Separation Guidelines
48-Irrigation Agreement

Project: SH 92 Stengel's Hill
Project Sub Acct. No: 17772
January 16, 2014
Technical Requirements

Section 1 – General

Project Description

The existing facility is a two-lane rural highway consisting of non-standard shoulders, deteriorating asphalt surface, non-compliant sight distances and an at-grade railroad crossing.

The intent of the proposed Project is to increase safety and mobility by providing a grade separated railroad crossing structure (I-05-Z), providing an Eastbound climbing lane, providing acceleration /deceleration lanes at Pleasure Park, providing standard shoulder widths, approach road reconstruction and drainage improvements. This will include roadway re-construction, widening and horizontal and vertical alignment shifts to comply with the geometric standards and Union Pacific Railroad requirements outlined in the Contract.

Project Location

The Project is located on SH 92 between Delta, CO and Hotchkiss, CO in Delta County. The project limits have been defined from mile marker (MM) 13.7 to MM 15.5.

Construction Configuration

The Construction Configuration is defined as all Work that the Contractor is required to construct as defined by the Contract documents. Bidders are directed to Project Technical Requirements described within in the Contract.

The Major Elements of the Construction Configuration are as follows**:**

1. Construct structure I-05-Z for the grade separated railroad crossing. See plan details in Reference Documents and accompanying Technical Requirements.

2. Construct roadway approaches/wall structures to accommodate grade separated railroad crossing and horizontal/vertical alignment shifts. See plan details in Reference Documents and accompanying Technical Requirements.

3. Construct roadway re-alignment/reconstruction to accommodate geometric safety standards and railroad crossing. See plan details in Reference Documents and accompanying Technical Requirements.

4. Construct Big Gulch Concrete Arch extension See plan details in Reference Documents and accompanying Technical Requirements.

5. Construct drainage improvements including but not limited to new culverts, culvert replacement, culvert extensions, siphon replacement and drainage ditches. See plan details in Reference Documents and accompanying Technical Requirements.

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6. Construct signing and pavement marking. See plan details in Reference Documents and accompanying Technical Requirements.

7. Implementation of construction staging, traffic detours and traffic control during construction. See plan details in Reference Documents and accompanying Technical Requirements.

8. Preparation of the Storm Water Management Plan, including obtaining Colorado Discharge Permit System-Stormwater Construction Permit and design and construction of all structures to accommodate requirements. See plan details in Reference Documents and accompanying Technical Requirements.

9. All work shall be completed within existing and proposed CDOT ROW, Temporary Easements and Permanent Easements.

10. Coordination of Design and Construction with CDOT, UPRR and Utility Onwers.

The Contractor and its design team may adjust the alignments of Construction Configuration elements within the limits listed below:

A. Any geometric changes must meet all Contract design criteria.
B. Additional permanent Project ROW must not be required to accommodate the Construction Configuration.
C. Meet UPRR Grade Separated Structures Guidelines and Guidelines for Temporary Shoring.

Contract Components

The Contract consists of the following items. Construction shall be governed by the 2011 "CDOT Standard Specifications for Road and Bridge Construction", as revised by the contract:

1. Contractor's Proposal
2. Instructions to Proposers and Notice to Bidders
3. Technical Requirements
    - Section 1 – General
    - Section 2 – Project Management
    - Section 3 – Quality Management
    - Section 4 – Public Information
    - Section 5 – Environmental Requirements
    - Section 6 – Third Party Agreements
    - Section 7 – Utility Relocations
    - Section 8 – Right-of-Way
    - Section 9 – Survey
    - Section 10 – Geotechnical and Roadway Pavements

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Section 11 – Earthwork
Section 12 – Hydraulics
Section 13 – Roadway Design
Section 14 – Signing, Pavement Markings, and Lighting
Section 15 – Structures
Section 16 – Maintenance of Traffic
Section 17 – Landscaping
Section 18 – Maintenance During Construction
Section 19 – Modifications to Standard Specifications

4. Contract Drawings (ROW Plans)
5. Contractor prepared Project Plans, drawings and details
6. 2011 CDOT Standard Specifications for Road and Bridge Construction
7. 2012 M & S Standard Plans with most recent revisions

Contract Hierarchy

Each of the Contract Documents is an essential part of the Contract and a requirement occurring in one is as binding as though occurring in all. The Contract Documents are intended to be complementary and to describe and provide for a complete Contract. If there is any conflict among the Contract Documents, the order of precedence shall be as set forth below:

1. Instructions to Proposers
2. Technical Requirements
3. Standard Special Provisions
4. 2011 CDOT Standard Specification for Road and Bridge Construction
5. M & S Standard Plans
6. The Proposal Documents, to the extent that they meet or exceed the requirements of the other Contract Documents. In other words, if the Proposal Documents include statements that can reasonably be interpreted as offers to provide higher quality items than otherwise required or to perform services in addition to those otherwise required or otherwise contain terms which are more advantageous to CDOT than the requirements of the Contract Documents, the Contractor's obligations hereunder shall include compliance with all such statements, offer, and terms.

Notwithstanding the foregoing, in the event of conflicting requirements involving any requirement within the Contract Documents or reference documents, CDOT shall have the right to determine, in its sole discretion, which requirement(s) apply. The Contractor shall request CDOT's determination respecting the contract hierarchy among conflicting provisions promptly upon becoming aware of any conflict.

Section 1 – General

Design Requirements

Design Surveys

The Contractor shall arrange for all supplemental survey information and utility locations necessary to complete the design and construction. Surveying shall be performed in accordance with the CDOT Survey Manual. Traffic control and permits necessary to complete the survey shall be the responsibility of the Contractor. The Contractor will deliver the data (in InRoads TMOSS survey format) and field notes to CDOT for review upon completion of the survey. Errors and omissions found by the CDOT Project Manager shall be corrected by the Contractor and resubmitted.

General

The Contractor shall perform the design work as described herein. Clarification, if required, will be provided by the CDOT Project Manager. Specific design criteria are required for Professional Engineering Services, including Roadway, Hydraulics, Traffic and Structural elements.

Bidders will not be compensated by CDOT for any design required to prepare the Proposal or the bid for the work, except for the stipend, if awarded. Bidders who will have performed design work before award, but who do not get the award, for any reason, will have performed that work solely at their own cost, not subject to reimbursement by CDOT.

All designs provided by the Contractor shall be completed under the responsible charge of a Professional Engineer registered in the State of Colorado. The designs and plans shall be sealed in accordance with the bylaws and rules of procedure of the Colorado State Board of Registration for Professional Engineers and Professional Land Surveyors by the responsible engineer in charge.

The Contractor shall ensure that the design meets all applicable design criteria including but not limited to the safety and serviceability, as described herein and as shown on the Plans. The Contractor shall use the plans, references and guidelines indicated herein for the design criteria.

Designs predicated on any errors or omissions in the Contract will be rejected. If any such error, omission or discrepancy is discovered, the Contractor shall notify CDOT immediately. Failure to notify CDOT will constitute a waiver of all claims for misunderstandings, ambiguities, or other situations resulting from error, omission, or discrepancy.

Major structure designs provided by the Contractor shall include an independent design review and check by an engineer registered in the State of Colorado other than the engineer-of-record.

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Some activities such as exploratory drilling on existing pavement or access to the State Highway system may require a Utility Permit from CDOT. Permits shall be obtained by the Contractor and copies shall be submitted to the CDOT Project Manager.

Roadway Engineering

All drawings/plan sets will be produced using CDOT's CADD standards. All electronic drawings and Roadway modeling will be developed in MicroStation/ InRoads using CDOT's latest configuration, workspace and drafting standards. CDOT's configuration and workspace can be downloaded from CDOT's website at: http://www.coloradodot.info/business/designsupport/cadd/microstation-inroads-configuration/v8i-ss2-configuration. All drawings/plan sets will be submitted in a PDF format and the appropriate electronic format (DGN, DTM, etc.). CDOT's configuration and workspace for MicroStation and InRoads can be downloaded from the CADD Website at no cost to the project or consultants.

All roadway design plans provided by the Contractor shall be in accordance with and meet all criteria specified in the CDOT Roadway Design Guide found at: http://www.coloradodot.info/business/designsupport/bulletins_manuals/roadway-design-guide. Plan sheets and details shall be prepared in accordance with the CDOT Drafting Manual. The Contractor shall use references listed herein when necessary design criteria are not available in the CDOT Roadway Design Guide.

The completed survey contains information necessary to approximate the extent of the roadway fills or cuts. Guardrail shall be added as described in the Contract. The Contractor shall prepare roadway design plans and details for acceptance by the CDOT Project Engineer.

The Project design plans shall include the following:

- Plan and profile sheets including all horizontal and vertical alignment information
- Bridge plans
- Wall Plans
- Structure Cross Sections / Drainage Details
- Quantity tabulations and summaries
- Detour details
- Maintenance of Traffic details
- Roadway cross sections including earthwork information

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- Typical sections and locations
- Stormwater Management Plan
- Details of all additional work the Contractor determines necessary to complete the Contract.

Reference Documents

Reference documents listed in the Technical Requirements can be found at:

http://www.coloradodot.info/projects/sh92stengleshill

Definitions

Accept or Acceptance	Formal conditional determination in writing by the CDOT Project Manager that a particular matter or item appears to meet the requirements of the Contract Documents.
Approve or Approval	Formal conditional determination in writing by the CDOT Project Manager that a particular matter or item is good or satisfactory for the Project. Such determination may be based on requirements beyond those set forth in the Contract Documents without payment of additional compensation or a time extension and may reflect preferences of CDOT.
Nonconforming Work	Work performed that does not meet the requirements of the Contract Documents.
Punch List	The list of Work items with respect to the Project which remain to be completed after achievement of each Milestone Completion, each Segment Completion, or the Project Completion, generally limited to minor incidental items of Work necessary to correct imperfections which have no adverse effect on the safety or operability of the Project.
Quality Assurance (QA)	All those planned and systematic actions necessary for the Contractor to certify to CDOT that all Work fully complies with the requirements of the Contract Documents and that all materials incorporated in the Work, all equipment used, and all elements of the Work will perform satisfactorily for

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	the purpose(s) intended.
Quality Control (QC)	The activities performed by the Contractor, designer, producer or manufacturer to ensure and document that a product meets the requirements of the Contract Documents. Activities may include checking, materials handling and construction procedures, calibrations and maintenance of equipment, shop drawing review, document control, production process control, and any sampling, testing, and inspection done for these purposes.
Substantial Completion	Substantial Completion shall be the completion of all the Work associated with the Contract Requirements with the exception of the Work related to the Stormwater Permit and Landscaping Contract Requirement. The Contractor shall request Substantial Completion from CDOT. CDOT and the Contractor shall perform a final walk through and develop a punch list of items to be corrected to meet the Contract Requirements. The Contractor shall notify CDOT as soon as the punch list items are completed. When the punch list is completed, CDOT will verify completion and if Accepted, CDOT will issue a letter stating Substantial Completion has been achieved. Substantial Completion acceptance by CDOT will relieve the Contractor of maintenance responsibilities with the exception of the Stormwater Permit and Landscaping Contract Requirements.
Work	All duties and services to be furnished and provided by Contractor as required by the Contract Documents, including the administrative, design, engineering, quality control, quality assurance, Relocation, procurement, legal, professional, manufacturing, supply, installation, construction, supervision, management, testing, verification, labor, Materials, equipment, documentation and other efforts necessary or appropriate to achieve Final Acceptance except for those efforts which the Contract Documents specify will be performed by CDOT or other Persons. In certain cases the term is also used to mean the products of the Work.

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Deliverables

The Contractor shall submit the following to the CDOT Project Manager:

Deliverable	Acceptance or Approval	Schedule
Supplemental Design Survey (if required for Design-Build Design)	Acceptance	Before Final Acceptance
Field notes	Acceptance	Before Final Acceptance
Independent Design Review and Check by an Engineer	Acceptance	Before Final Acceptance

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Project Special Provisions

CONTRACT GOAL

The Department has determined that Underutilized Disadvantaged Business Enterprises (UDBEs) will participate by contracting for a part of the Work of this Contract. The contract goal for participation in this Contract by certified DBEs who have been determined to be underutilized has been established as follows:

Construction	**7.5%**	**Seven and a half Percent**

The percentage will be calculated from proposals received for this project according to the following formula:

$$\text{Percentage} = 100 \times \frac{\text{**Dollar amount of work to be contracted to underutilized DBEs (UDBEs)}}{\text{Total dollar amount of the original Contract}}$$

***** All DBEs will be considered to be UDBEs.
****** Based on DBE contract unit prices rather than prime contract unit prices.

NOTE: Specific Good Faith Efforts required to meet the Contract Goal specified above are defined in the Standard Special Provisions

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COMMENCEMENT AND COMPLETION OF WORK
BASIC COST PLUS TIME BIDDING

The Contractor shall select the date that work begins for this project. The Contractor shall notify the Engineer, in writing, at least 20 days before the proposed beginning date. The date that work begins shall be subject to the Region Transportation Director's approval. A different date may be authorized in writing by the Chief Engineer in the "Notice to Proceed."

The Contractor shall achieve project substantial completion in the number of calendar days submitted as part of the bid submittal and shall complete all work in accordance with the "Notice to Proceed."

Stockpiling of materials before the beginning date is subject to the Engineer's approval. If such approval is given, stockpiled material will be paid for in accordance with Sections 109 and 626.

Salient features to be shown on the Contractor's progress schedule shall be as shown in Section 2 – Project Management of the Technical Requirements.

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REVISION OF SECTIONS 101, 102, 105 AND 108
BASIC COST PLUS TIME BIDDING

Sections 101, 102, 105 and 108 of the Standard Specifications are hereby revised for this project as follows:

Delete subsection 101.22 and replace with the following:

101.22 Contract Time. The maximum number of calendar days allowed for substantial completion of the Contract specified in subsection 102.11(a), second paragraph.

Add subsection 102.11 as follows:

102.11 Cost Plus Time Bidding. A special bidding procedure will be used to determine the successful bidder for this project. This procedure takes into account the price offerings from the bidder and the time the bidder intends to take to substantially complete the work.

The work will be considered substantially completed when it conforms to the Contract and has been accepted in accordance with subsection 105.21(c).

(a) *Preparation of Proposal.* The bidder shall establish the number of calendar days that will be required to substantially complete the work. The calendar day number shall be included in the bid proposal. This calendar day number multiplied by the daily cost shall be added to the total amount bid for the work items.

The total number of calendar days established by the bidder to substantially complete the work shall not exceed 579 calendar days. Bids showing time for completion in excess of this amount will be considered non-responsive.

(b)*Late Completion of the Work Disincentive.* If the number of calendar days required to substantially complete the work is in excess of the total number of calendar days bid, a disincentive will be deducted from payments made to the Contractor. This disincentive (D) will equal the actual number of calendar days required to substantially complete the work (C) minus the number of calendar days bid (B) multiplied by the daily cost. The daily cost will be $5,000.

D = (C – B) ● (the daily cost)

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REVISION OF SECTIONS 101, 102, 105 AND 108
BASIC COST PLUS TIME BIDDING

Subsection 105.21, shall include the following:

(c) *Substantial Completion.* Substantial Completion shall be the completion of all the Work associated with the Contract Requirements with the exception of the Work related to the Stormwater Permit and Landscaping Contract Requirements.

The Contractor shall request Substantial Completion from CDOT. CDOT and the Contractor shall perform a final walk through and develop a punch list of items to be corrected to meet the Contract Requirements. The Contractor shall notify CDOT as soon as the punch list items are completed. When the punch list is completed, CDOT will verify completion and if accepted, CDOT will issue a letter stating Substantial Completion has been achieved.

Substantial Completion acceptance by CDOT will relieve the Contractor of maintenance responsibilities with the exception of the Stormwater Permit and Landscaping Contract Requirements.

Subsection 108.09, first paragraph, shall include the following:

These liquidated damages will be assessed in addition to disincentives for failure to substantially complete the work in the time bid by the Contractor in accordance with subsection 102.11(b).

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ON THE JOB TRAINING CONTRACT GOAL

The Department has determined that On the Job Training shall be provided to trainees with the goal of developing full journey workers in the types of trade or classification involved. The contract goal for On the Job Trainees working in an approved training plan in this Contract has been established as follows:

Minimum number of total On the Job Training required 2240 hours.

Section 1 – General

REVISION OF SECTION 102
BIDDING REQUIREMENTS AND CONDITIONS

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

Subsection 102.01 shall include the following:

Only bidders whose Professional Engineering Firm for Design Services is prequalified with the Department will be allowed to bid on the project.

In Subsection 102.02, delete the second sentence and replace with the following:

This form will state the location and description of the contemplated construction, and will have an item for which a lump sum bid is invited.

Delete subsection 102.03 (b) and replace with the following:

(b) *Measurement Not Required.* When the Contract does not require quantities of work performed or material furnished to be measured, payment will be made by lump sum, as amended elsewhere in the Contract.

Subsection 102.05 shall include the following:

The following information will be available for review on the website at http://www.coloradodot.info/projects/sh92stengelshill

Instructions to Proposers and Notice to Bidders
Index of Technical Requirements, Contract Documents and Reference Documents
Technical Requirements / Project Special Provisions
Standard Special Provisions
Contract Documents
Reference Documents

In Subsection 102.07 delete subsections (4) and (5).

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REVISION OF SECTION 104
FINAL CLEAN UP

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

In subsection 104.06 shall include the following:

Final cleaning up shall include all items or results of work necessary for the performance of work but temporary in nature. These items shall include but not be limited to removal of construction stakes, temporary earth berms for containment sites, shaping and restoration of temporary facility sites.

All costs incidental to the foregoing requirements shall be included in Work.

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REVISION OF SECTION 107
PROTECTION OF LANDSCAPE

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

Subsection 107.12 shall include the following:

The Contractor shall save all existing vegetation and other environmental features except for those which must be removed or altered to accommodate the roadway and related structures.

Material storage, equipment parking, vehicle parking, and stockpiling excavated material will be allowed only in those areas designated by the Engineer. Specified areas of vegetation and other environmental features to be protected will be staked, fenced, or otherwise marked in the field by the Engineer. However, the fact that areas of vegetation and other environmental features are not marked does not necessarily mean that these items are expendable. The Contractor shall perform all his activities 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 removal or any damaging activity. Damage or destruction of unmarked trees and shrubs which could reasonably have been saved shall therefore be subject to the provisions of this Special Provision.

If the fence, staking, or marking is knocked down or destroyed by the Contractor, the Engineer will suspend work wholly or in part, until the fence or other protection is repaired to the Engineer's satisfaction at the Contractor's expense. Time lost due to such suspension will not be considered a basis for adjustment of time charges, but will be charged as contract time.

If the Contractor disturbs any of the landscape designated to remain, he shall restore those areas as directed by the Engineer at the Contractor's expense. Vegetation damage for any reason, outside of the staked limits, is the responsibility of the Contractor.

The Department may require that the Contractor replant an area that is damaged. The work shall be done as directed by the Engineer. If the Contractor is deemed to be responsible, then the replanting is to be done at the Contractor's expense.

With respect to replacement of trees and shrubs that have been damaged or destroyed, the following conditions will apply:

1) Trees and shrubs of replaceable size shall be replaced at the Contractor's expense. If the Contractor fails to do so within a reasonable amount of time as

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REVISION OF SECTION 107
PROTECTION OF LANDSCAPE

determined by the Engineer, the replacement value of the trees or shrub will be deducted from any moneys due to the Contractor.

2) When trees or shrubs beyond replaceable size have been damaged or destroyed, the value of each tree or shrub shall be determined by the Engineer, based on the "Guide for Established Values of Tree and Other Plants" prepared by the Council of Tree and Landscape Appraisers, published under the auspices of the International Society of Agriculture. The value will be deducted from any money due to the Contractor. This deduction will not be considered a penalty, but as liquidated damages.

The determination as to whether a plant is of replaceable size or beyond will be made by the Engineer. If the plant has been disposed of, the value will be placed as if it were beyond replaceable size, based upon average spacing of like kind in an adjoining area of similar vegetation.

Any deduction assessed as liquidated damages under this section shall not relieve the Contractor from liability for any damages or costs resulting from delays to the Department, traveling public, or other contractors.

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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:

(1) Overhead girder erection for bridge I-05-Z
(2) Overhead structure construction
(3) Temporary works: falsework, shoring that exceeds 5 feet in height, cofferdams, and temporary bridges
(4) Work requiring the use of cranes or other lifting equipment
(5) Excavation and embankment adjacent to the roadway and/or Railroad, especially if it requires shoring

The Contractor shall submit, for record purposes only, an initial detailed construction plan that addresses safe construction of each of the safety critical elements. When the specifications already require an erection plan or a bridge removal plan, it shall be included as a part of this plan. 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:

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

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REVISION OF SECTION 107
PERFORMANCE OF SAFETY CRITICAL WORK

B. Training taken in performing similar work
C. Certifications earned in performing similar work

(8) The construction plan shall address how the Contractor will handle contingencies such as:
A. Unplanned events (storms, traffic accidents, etc.)
B. Structural elements that don't fit or line up
C. Work that cannot be completed in time for the roadway to be reopened to traffic
D. Replacement of workers who don't perform the work safely
E. Equipment failure
F. Other potential difficulties inherent in the type of work being performed

(9) 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.

(10) Erection plan when submitted as required elsewhere by the specifications. Plan requirements that overlap with above requirements may be submitted only once.

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. Required pre-erection conferences or bridge removal conferences may be included as a part of this 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, Removal of Portion of Bridge and Temporary Works. 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.

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REVISION OF SECTION 107
PERFORMANCE OF 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 108.06.

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.

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 Department.

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REVISION OF SECTION 108
PROJECT SCHEDULE

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

Subsection 108.03 shall include the following:

The Engineer will review schedule submittals; such review shall not constitute an Approval of the Contractor's construction means, methods, sequencing, or its ability to complete the Work in a timely manner.

Subsection 108.03 (c) delete the first sentence of the second paragraph and replace with the following:

The Contractor shall use Microsoft Project software to develop and manage the Critical Path Method Schedule.

Subsection 108.03 (c) shall include the following:

Changes in logic and/or durations shall not be made without first providing written notification to Engineer for Contractor's need to change. No work/activity shall commence without written Approval from the Engineer accepting said changes.
Consideration will be given for Contractor changes as they are determined to be reasonable by narrative explanation. Acceptance or rejection of such changes is without liability. Logic or Duration changes to simply accommodate a perception of still being on-schedule will not be accepted.

A revision of the Schedule may include a Recovery Schedule. At the discretion of the Engineer, when the most current Accepted Schedule Update no longer represents the actual prosecution and progress of the work, the Engineer shall require a Recovery Schedule. If it is determined that a Recovery Schedule is required, it shall be provided to the Engineer for review within 15 calendar days of written notification. The Recovery Schedule shall include the original Contract work and all Approved Change Order work. The Engineer's review of the Recovery Schedule will not exceed seven calendar days. Revisions required as a result of the Engineer's review shall be submitted within seven calendar days. When Accepted by the Engineer in writing, the Recovery Schedule shall become the Project Schedule. All cost related to performing the work in the Recovery Schedule will not be paid for separately, but shall be included in the work. Failure to provide the required schedule information at the required times will result in denial of the relative portion of progress payments until such time that the schedule information is submitted in the correct format at the sole option of the Engineer.

The following requirements have been defined to create consistency across all project schedules for purpose of analysis.

Section 1 – General

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REVISION OF SECTION 108
PROJECT SCHEDULE

(1) Dependencies between activities shall be indicated so that it may be established as to the effect the progress of any one activity would have on the Schedule. Dependencies shall make use of Finish-to-Start (FS), Start-to-Start (SS), or Finish-to-Finish logic ties. Use of Start-to-Finish (SF) logic ties shall not be allowed without written justification and Acceptance prior to implementation. Leads or lags will not be used when the creation of an activity will perform the same function (e.g., concrete cure time). Dependencies shall not make use of negative lags. The use of any lead or lag shall require a written explanation by the Contractor in a narrative.

(2) All activities, except Notice-to-Proceed and Final Completion, are required to have at least one predecessor and one successor.

(3) Date and time constraints, other than those required by the contract, will not be allowed unless Accepted by the Engineer.

(4) Calendar day shall demonstrate conformance to Section 108.08 of Standard and Specifications for Road and Bridge Construction.

(5) The schedule should be broken down into logical areas of work.

(6) Summary of Activities

i. The Contractor shall include special activities that are a Summary of a chain of activities. The start of the activity will be the start date of the first activity in the chain and the finish date will be the finish date of the last activity in the chain.

ii. Included in the Summary area should be a Summary activity designated as Contract Time. The summary activity shall have Notice-to-Proceed as its predecessor, with a SS 0 relationship; and Contractual Substantial Completion as its successor, with a FF 0 relationship. The Calendar day schedule shall be used for all Summary activities. The duration of this activity must not exceed the contract time.

iii. The purpose of these Summary activities is to provide monitoring of the contract time and Area progress.

Section 1 – General

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REVISION OF SECTION 108
PROJECT SCHEDULE

(7) Tasks related to the submittal/procurement of material or equipment shall be included as separate activities in the project schedule.

(8) Contractor's original network diagram submittal shall become the Project Schedule, once it is Accepted by the Engineer. The Project Schedule shall be duplicated and utilized as the Schedule Update and shown graphically over the Project Schedule.

(9) The following logic relationships will be required in any precedence diagram method used:

i. All logical relationships shall be Finish-to-Start (FS), with the following exceptions:
   - at the start or origin, activities may be start to start (SS)
   - at a milestone or at the conclusion of the network, activities may be Finish-to-Finish (FF)
   - use in Summary activities

ii. Lag factor use should be limited. When used, they should be identified as a functional activity (i.e., concrete curing).

iii. Accepted Schedules shall only contain Contract Required Early Start and/or Early Finish Constraints.

iv. The retained logic mode is required for schedule calculations.

Any deviations / change from these logic specifications require written request to be reviewed for Acceptance from the Engineer prior-to implementation, to prevent manipulations to give false results.

Use of float suppression techniques, such as preferential sequencing (arranging critical path through activities more susceptible to CDOT caused delay):

a. Special lead/lag logic restraints,

b. Zero total or free float constraints,

c. Imposing constraint dates other than as required by the contract, shall be cause for rejection of the Project Schedule or its Updates. The use of Resource Leveling or similar software features used for the purpose of artificially adjusting activity durations to consume float and influence the critical path is expressly prohibited.

Section 1 – General

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REVISION OF SECTION 108
PROJECT SCHEDULE

Definitions of Float (or Slack):

a. Free Float is the length of time the start of an activity can be delayed without delaying the start of a successor activity.

b. Total Float is the length of time along a given network path that the actual start and finish of an activity or activities can be delayed without delaying the project completion date.

c. Project Float is the length of time between the Contractor's Early Completion or Substantial Completion and the Contract Completion Date.

d. Project Float is for the benefit of the Project and for the mutual use of the CDOT and the Contractor.

Negative float will not be a basis for requesting time extensions. Any extension of time will be addressed in accordance with the Section 108.08, Determination and Extension of Contract Time. Scheduled completion dates that extend beyond the contract or phase completion dates (evidenced by negative float) may be used in computation for assessment of payment withholdings. The use of this computation is not to be construed as a means of acceleration.

In Subsection 108.03 (c) delete subsection (1)

In Subsection 108.03 (c) (2), delete the first paragraph and replace with the following:

The Project Schedule submittal shall consist of a Time Scaled Logic Diagram Schedule Report. It shall be prepared in full and submitted to the Engineer within 30 calendar days of receiving the Notice to Proceed for Design. The Engineer's review of the Project Schedule will not exceed seven calendar days. Revisions required as a result of the Engineer's review shall be submitted within seven calendar days.

Subsection 108.03 (c) (2) Project Schedule shall include the following:

The schedules shall include all activities required for contract completion. The Project Schedule shall be submitted to the CDOT Project Engineer for Acceptance.

a. Within seven calendar days after receipt of the complete Project Schedule, the Engineer will communicate in writing, its comments and concerns to the Contractor. Within seven calendar days, Contractor shall adjust the Schedule to incorporate comments from the Engineer and re-submit.

Section 1 – General

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REVISION OF SECTION 108
PROJECT SCHEDULE

b. Upon Engineer's receipt and Acceptance of revisions to the Project Schedule, it shall become part of the Contract Documents. Payment to the Contractor shall be withheld until such schedule, satisfactory in form and substance to the Engineer, has been Accepted.

Subsection 108.03 (c) (3) Schedule Updates shall include the following:

Updated Schedules shall accompany the monthly Application for Payment, reflecting physical progress since previous month's submittal.

One plotted copy at least 24 inches wide and long enough to show the full Time Scaled Logic Diagram and the following columns: Task ID, Description, Duration, Total Slack, Percent Complete, Early Start and Finish, Late Start and Finish, Actual Start, and Actual Finish dates. In addition one electronic copy containing the Microsoft Project Schedule Update shall be submitted.

The Schedule Update shall show the actual status of all activities, including those in progress, completed, or not started, by the use of Actual start and Actual finish dates. For all Activities that have a Contractor remaining duration equal to zero days, the Activity shall be shown as 100% complete. Any percentage less than 100% shall have a remaining duration in whole 1 day increments. In addition Activities having a remaining duration of zero cannot be claimed as less than 100% complete.

Actual Start and Finish dates shall not be automatically updated by default mechanisms that may be included in the CPM scheduling software system. Actual Start and Actual Finish dates on the CPM schedule shall match the dates of actual work accomplished in the field and not on projected completion dates.

Upon Engineer request, the Contractor shall provide a computer generated report using a recognized schedule comparison software listing ALL changes made between the previous schedule and current updated schedule. The report will identify the name of the previous schedule and name of the current schedule being compared.

The Contractor shall utilize and conform to the current Accepted Project Schedule.

Section 1 – General

REVISION OF SECTION 108
LIMITATIONS OF OPERATIONS

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

Subsection 108.05 shall include the following:

The Contractor shall protect existing fences and in under no circumstance shall trespass outside of CDOT acquired ROW, temporary easements and permanent easements. In the event the Contractor causes damage to the existing fences, the Contractor shall immediately replace it in kind, at his own expense.

Section 1 – General

REVISION OF SECTION 108
PROSECUTION AND PROGRESS

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

Subsection 108.05 shall include the following:

Contractor will be restricted to conducting all work, except for traffic control set up and tear down, from one hour after sunrise to one hour before sunset, unless otherwise approved in writing by the Engineer.

The Contractor shall cease work on the project and have all personnel and equipment off the roadway by 1:00 P.M. on work days preceding holidays recognized by the State of Colorado, as described in Standard Specification 101.36. For example, this directive applies to Thursday, July 3, 2014 for the Independence Day holiday, Friday, August 29, 2014 for the Labor Day holiday, and Friday, May 23, 2014, for the Memorial Day holiday.

Price reductions for failure to comply with this requirement will be as specified in the Standard Special Provision entitled "Revision of Section 105 – Violation of Working Time Limitation".

All costs incidental to the foregoing requirements shall be included in the Work.

Section 1 – General

REVISION OF SECTION 109
MEASUREMENT AND PAYMENT

Section 109 of the Standard Specifications is hereby revised for this project as follows:

Subsection 109.02 shall include the following:

The intent of this project is to provide the work in a lump sum (LS) basis for work related to the complete the entire project for both 631-00100 Highway Design & Construction and 631-10002 Bridge Design and Construction. All items necessary for the completion of the work shall not be measured and paid for in the listed pay items for each Basis of Payment section of the Standard Specifications but shall be included in the Lump Sum price to complete either the roadway item or structure item.

Sections of Basis of Payment within the Standard Specifications and Standard Special Provisions will be disregarded.

Section 620 Field Facilities of the Standard Specifications shall not modified by this revision.

Section 1 – General

FORCE ACCOUNT ITEMS

DESCRIPTION

This special provision contains the Department'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.

Force Account Item	Estimated Quantity	Amount
F/A Minor Contract Revisions	F.A.	$ 500,000.00*
F/A Partnering	F.A.	$4,000.00
F/A Fuel Cost Adjustment	F.A.	$100,000.00
F/A Roadway Smoothness Incentive	F.A.	$50,000.00
F/A Asphalt Cement Cost Adjustment	F.A.	$20,000.00
F/A Asphalt Pavement Incentive	F.A.	$60,000.00
F/A On-The-Job Trainee	F.A.	$4,480.00
F/A Dispute Resolution Board	F.A.	$5,000.00

Section 2 – Project Management

Administration

The Contractor has the responsibility for management and performance of the Work. CDOT will perform all Quality Assurance testing and Verification on the project.

Work Breakdown Structure (WBS)

The Contractor shall submit to the CDOT Project Engineer a Project Schedule for Acceptance, including a detailed and organized hierarchical division of the Work Breakdown Structure (WBS) for completing each element of the Work.

The following list represents the minimum levels of the WBS that all cost and schedule information shall roll-up. The schedule shall also address review and response times, procurement (submittals, reviews, approvals, and delivery) and all Safety Critical elements. Further detail may be provided by the Contractor to ensure a clear understanding of the Contract. The Contractor shall submit its Project Schedule broken down to the WBS activities and proposed Work segments within 30 calendar days of receiving the Notice to Proceed for Design.

The Accepted WBS shall be the basis for organizing all Work under the Contract, and shall be used to structure the Project Schedule, and other cost control systems.

The WBS Breakdown of Design and Construction Components shall include:

- SH92 Stengel's Hill Project
    - Design
        - Highway and Road Approaches
        - Bridge
        - Big Gulch Arch Concrete Culvert
        - Drainage
        - Wall
    - Construction
        - Highway
            - Highway and Road approaches
            - Drainage
            - Earthwork
            - Guardrail
            - Fencing
            - Signing and Striping
            - Traffic Control
            - Detours
            - Water Quality/Environmental Management
            - Public Information
        - Bridge

Section 2 – Project Management

    - Big Gulch Arch Concrete Culvert
    - Wall
- Mobilization
- Field Facilities

Work Activities

The WBS breakdown shall include at a minimum the components listed above and shall be broken down into further subcomponents in order to accurately track production on the project. The Project Engineer shall have the discretion to request further breakdown of the WBS into the "level of detail" deemed fit. Monthly payment to the Contractor shall be based on the percent completed of each of the WBS work activities, as a percentage of the Contract Lump Sum.

The Contractor shall prepare and submit to the CDOT Project Engineer the following schedules:

- Method Statements
- Project Critical Path Method (CPM) Schedule
- CPM Schedule Updates
- Job Progress Narrative Report

Each of the CPM schedules shall be cost loaded for the WBS indicated above.

Allocation of Contract Price

Contractor shall allocate the lump sum Contract Price among the WBS such that each structure activity including design, construction, and related work has a price allocation that accurately indicates the cost of each activity. The Contractor's allocation of the lump sum Contract Price shall be Approved by the CDOT Project Engineer. Each of the activities shall be allocated a cost and a physical unit that will allow objective determination of activity completion. The cost of Water Quality / Environmental Management, and Public Information shall be paid by straight line calculation through the life of the project. The cost of Public Information shall not exceed $5,000. The cost of Mobilization shall not exceed 7 percent of the lump sum Contract. Field Facilities shall only include the cost of obtaining and maintaining the Field Facilities and not exceed 0.5 percent of the lump sum.

Requests for unbalanced costs will be rejected if the Department determines that any of the allocated costs are materially unbalanced to the potential detriment of the Department. Unbalanced costs are defined in subsection 102.07 of the Standard Specifications for Road and Bridge Construction.

Section 2 – Project Management

Methods Statement

A Methods Statement shall be prepared for each of the level four work activity listed in the schedule, for any critical path items in the schedule, for all safety critical elements, and for any feature not listed in the schedule that the Contractor considers a controlling factor for timely completion. The Methods Statement shall be completed in accordance with subsection 108.03 of the Standard Specifications for Road and Bridge Construction.

Cost Management

Progress Payment Calculations

CDOT will base progress payments on the percent completed of each of the WBS work activities and not on measured quantities. The Contractor shall progress the activities identified on the Project Schedule for determining the Monthly Progress Schedule. The accepted Monthly Progress Schedule will determine the amount of the Contractor's progress payments, based on the work activities identified by the Contractor. Percent complete shall be calculated using project scheduling software meeting the requirements of this section, where progress is measured based on physical percent of work that is complete considering labor, materials equipment resources utilized, design hours, or other physical units acceptable to the CDOT Project Engineer. Such progress payments to the Contractor shall be computed accurately from the updates of the WBS schedule.

Partial payment for stockpiled materials shall only be made per subsection 109.07 of the Standard Specifications for Road and Bridge Construction. Payment shall not be made for stockpiled materials to be installed within 90 days.

The Contractor's invoice shall not include a request for payment for documented nonconforming work. The payment to the Contractor will be the amount shown on the Contractor's approved invoice as modified for appropriate price reductions for nonconforming work, if any, retainage, incentive/disincentive payments, and any deductions.

Payment Schedule

The Contractor shall provide an additional payment schedule in accordance with Standard Special Provision Revision of Section 108 and 109 Payment Schedule (Multiple Year Construction).

Invoice Submittals

The Contractor shall submit invoices to the CDOT Project Engineer each month. Each monthly invoice shall first be submitted in draft form for review in a Progress Status Meeting on a date mutually agreeable to the Contractor and CDOT Project Engineer. Draft monthly invoice submittals shall be transmitted with at least one paper copy and an electronic format.

Section 2 – Project Management

The Contractor shall submit to the CDOT Project Engineer, for Approval, a final monthly invoice within five calendar days after each progress status meeting, defined below. Final invoice submittals shall include one paper copy and one electronic copy.

Invoice Documents

Invoice Content

The invoice documents shall include:

1. Invoice Cover Sheet

   The cover sheet shall indicate the following information:

   A. Project number and title

   B. Invoice number (numbered consecutively starting with "1")

   C. Period covered by the invoice (specific calendar dates)

   D. Total earned to date for the Project as a whole and for each Work activity. The breakdown is required because retainage will be calculated and withheld on each work segment, and partially released upon achievement of segment completion of each Work segment

   E. Date that invoice was signed

2. Updated Monthly Progress Schedule

   No invoice shall be Approved nor payment shall be made if there is not a current Accepted Monthly Progress Schedule in place. The status date of the Monthly Progress Schedule, coinciding with the payment invoice date, is the last date of each month. The data date for use in calculating the monthly progress schedule shall be the first Calendar Day of the following month.

   The Contractor shall make all corrections to the Monthly Progress Schedule requested by the CDOT Project Engineer and resubmit the Monthly Progress Schedule within seven calendar days. If the Contractor does not agree with the CDOT Project Engineer's comments, the Contractor shall provide written notice of disagreement within seven calendar days from the receipt of the comments. If necessary, the items in disagreement shall be resolved in a meeting held for that purpose.

No invoice will be reviewed or processed until all invoice documents and updated Project schedule are received by the CDOT Project Engineer.

Section 2 – Project Management

Progress Status Meetings

A progress status meeting shall be conducted each time a draft monthly invoice submittal is made. The meeting shall be used to verify, address and finalize the following:

1. Actual start dates
2. Actual and Planned Completion Deadlines
3. Earned value of Work that has been accepted in-place
4. Activity percent complete
5. Incorporation of approved Change Orders
6. Status of outstanding Nonconforming Work
7. Completion of Value Engineering Change Proposals, if any
8. Work performance
9. Project Schedule narrative that discusses all changes from previous month
10. Critical Path(s)

Following the progress status meeting, and upon approval of the final monthly invoice, payment shall be Approved by the Project Engineer within seven calendar Days.

WBS Activities and Schedule Modifications

When it becomes necessary to add, combine, eliminate, or modify Contract specified WBS Activities to reflect modifications to the Work, such changes shall be reviewed and Accepted by the CDOT Project Engineer in accordance with the Contract and shall be consequently reflected in subsequent schedule submittals.

Field Facilities

The Contractor shall provide all office space and equipment as required for the Project.

The Contractor shall make available a fully operational Field Office and Field Materials Lab facilities three calendar days prior to beginning any Construction Activities. CDOT shall return possession of each to the Contractor no later than 20 calendar days after Substantial Completion Acceptance of the Project.

The Contractor shall secure sites, obtain all site permits, install, set up, and provide utility services, and maintain the facilities as part of the Work. The Contractor may consult with the CDOT Project Engineer for the availability of suitable local sites. The Field Materials Lab shall be placed adjacent to the Contractor's Quality Control lab. These facilities including the Field Office shall be located within 8 miles of the project location.

Section 2 – Project Management

If office appurtenant facilities are stolen, destroyed, or damaged during the Work, except by fault of CDOT, the Contractor shall at, its expense, repair or replace those items provided to their original condition within three calendar days. If loss or damage is caused by CDOT personnel, the Contractor shall replace the facilities within 3 calendar days, but CDOT shall be responsible for costs incurred.

The Contractor shall provide:

1 – Field Office Class 2
1 – Field Laboratory Class 2
1 – Sanitary Facility for CDOT staff use

All field facilities shall conform to CDOT Standard Specifications and Standard Plans in effect at the time of bidding. In addition to the Standard Plans and Specifications the Field Office and Laboratory shall include the following:

1. High Speed Internet: The type of high speed connection shall preferably be of DSL type. The throughput shall be a minimum of 1.5Mbps download/896 Kbps upload speed. IP addressing shall be DHCP. If DSL is not available, Cable or wDSL (Wireless DSL) may suffice if above specified throughput speeds are achieved. Note that satellite type broadband will NOT work for CDOT purposes.

2. Field Office and Field Laboratory shall be provided with all-weather access with adequate area to accommodate at least six state vehicles.

3. The Contractor shall provide insurance for full replacement of all contents of the Field Office and Field Laboratory due to theft, fire or any other cause. Insurance shall be provided at all times that the office or laboratory is on the Project.

Deliverables

The Contractor shall submit the following to the CDOT Project Engineer.

Deliverable	Acceptance or Approval	Schedule
Project CPM Schedule	Acceptance	30 days after Notice to Proceed for Design
Method Statements	Acceptance	20 days Prior to Construction
Schedule Updates including Job Progress Narrative	Acceptance	Monthly
Invoice Documents	Approval	Monthly

Section 3 – Quality Management

Administrative Requirements

The Contractor shall be responsible to develop, document, establish, and implement a Quality Control Document (QCD) for the project. Before any Release for Construction Documents (RFC) are issued, and within fifteen (15) Days following Notice to Proceed for Design, the Contractor shall submit the QCD to CDOT for Approval. The Contractor shall implement the Approved QCD prior to performing any Project activities. Any CDOT directed revisions to the QCD prior to Approval shall be made within three (3) Days.

Quality Control Document Requirements

The Contractor shall develop a Quality Control Document (QCD) to illustrate the Contractor's quality process and provide any supplemental descriptions needed to clarify the Contractor's quality process. This shall include the Contractor's approach to: Design Quality Control, Design Quality Assurance, Construction Quality Control, the interface with Construction Quality Assurance, the interface to resolve Design issues and changes, show the lines of authority, and effective team communications. The QCD shall illustrate the process for meeting all requirements of the Contract Documents. The Design Quality Manager shall instruct the Contractor, CDOT and Outside Agency personnel in the quality processes outlined in the QCD at the pre-construction conference so all parties can collaborate and understand roles and responsibilities effectively. The QCD should not exceed 15 pages.

At a minimum the QCD shall address the following:

1. The Contractor's Organization Chart including the Design Consultant.
   The Contractor's Organization Chart shall illustrate: lines of authority, lines of communication, interface positions with CDOT and Outside Agencies.

2. Process Diagrams for:
   - Design
     - Quality Control
     - Quality Assurance
     - Design Review
     - Released for Construction Documents
       - Roadway Plans
       - Structure Plans
       - Traffic Control Plans (TCP)
       - Storm Water Management Plans (SWMP)
     - Final Design Documents
     - As Built Documents
   - Construction
     - Quality Control
       - Product Data Control
     - Quality Assurance Interface
     - Design Interface

Section 3 – Quality Management

Request For Information (RFI)
Field Design Changes (FDC)
Methods of Handling Traffic (MHT)
Public Information (PI)
Substantial Completion Punch List Resolution

The Contractor's Process Diagrams shall illustrate the processes with a flow chart style depiction, and should minimize the written descriptions as much as possible.

As changes are made to the Contractor's Organization chart or Process Diagrams; updates shall be provided within five (5) Days.

Design Quality Control

The Quality Control Document (QCD) shall illustrate the process necessary for the Contractor to control the quality of their Design process in order to produce products that meet the requirements of the Contract Documents. The Contractor shall develop, and share with CDOT, their design review schedule to ensure quality control of the Design process.

Design Quality Assurance

In the QCD the Contractor shall illustrate the process to certify the Work as compliant with the requirements of the Contract Documents. The Contractor shall collaborate with CDOT and UPRR during the Design process to ensure the appropriate product is produced and requirements are met. During Construction the Design Quality Manager (DQM) shall ensure that Release for Construction (RFC), Traffic Control Plans (TCP), Method of Handling Traffic (MHT), Request for Information (RFI), Storm Water Management Plans (SWMP), and Public Information (PI) release documents are compliant with the requirements of the Contract Documents.

The QCD shall include the process to address applicable elements of design including, civil, structural, geotechnical, survey, hydraulic, environmental, traffic, safety, public information, and temporary work. The Contractor shall identify in the QCD all applicable computer programs to develop and check designs. The QCD shall illustrate the design effort, including design reviews, constructability reviews, design meetings, independent design checks, and a basic schedule for Release for Construction Documents and Final Design Documents.

The Contractor shall identify in the QCD design input requirements. The Contractor shall illustrate how changes to design inputs are identified, reviewed, and approved by authorized personnel prior to their implementation.

The Design Process Diagram shall also include:

1. Process to control and independently ensure that the design meets the requirements of the Contract Documents, including provisions for Subconsultant's designs and configuration management Activities.

Section 3 – Quality Management

2. Process for approval of Released for Construction Documents and revision control.
3. Process to identify and track Design Document deliverables.
4. Process to identify, record, and track Field Design Changes (FDC), and Request for Information (RFI) responses.

Design Quality Program

The Contractor's design quality program shall include:

1. Design Progress Meetings: The Contractor shall conduct meetings to coordinate the design development within the Contractor's organizations, CDOT, and other affected agencies. As a minimum, the Contractor shall prepare an agenda and conduct each meeting to discuss the status of the design, coordinate the design development between design disciplines, discuss constructability issues, and identify any questions associated with design requirements. The Contractor shall take meeting minutes and provide meeting minutes to CDOT's Project Engineer within four (4) Working Days after the meeting. These meetings shall a minimum of be bi-weekly or as requested by CDOT.

2. Released for Construction (RFC) Documents: Released for Construction Documents allow the Contractor to initiate construction in advance of Acceptance of the Final Design Documents by CDOT. The RFC Documents shall include all plans, quantities, method statements, and schedule required to complete a given portion of Work. The schedule shall include: submittal date, planned construction start date, inspection hold points, and planned duration. Failure to provide RFC Documents that comply with the Contract in a timely manner shall be cause for the Contractor not being permitted to work on that portion of the project until a proper submittal is made. All schedule delays due to incomplete RFC Documents shall be the responsibility of the Contractor. The Contractor's Design Quality Manager shall approve RFC Documents prior to submittal to CDOT. Each RFC Documents submittal shall be submitted to the CDOT Project Engineer a minimum of two (2) weeks before planned construction. Written Acceptance of the quantities and schedule must be received from CDOT before the Work begins on that portion of the RFC. The Contractor shall include in the QCD a process for the Engineer responsible for the design to prepare, review, approve, and seal (if required) all changes, including Field Design Changes (FDC), and Request for Information (RFI) responses. FDC and RFI responses must meet the requirements of RFC documents, except the submittal timeline will be as soon as possible.

3. Final Design Documents: The Contractor shall submit Final Design Documents to CDOT's Project Engineer for Acceptance. CDOT will not Accept the Final Design Documents until the Contractor has completed all design and has addressed, resolved, and incorporated, to the satisfaction of CDOT, any prior Contractor, CDOT, or Outside Agency Acceptance Review comments. The Design Quality Manager shall ensure and provide documentation to CDOT that all review comments have been addressed.

Section 3 – Quality Management

4. As-Built Documents: As-Built Documents shall be stamped by the Engineer and submitted to CDOT for Acceptance. CDOT may audit As-Built Documents to ensure completeness and compliance with the requirements of the Contract Documents.

The Contractor shall maintain a master list of approved design changes. The QCD shall include a process to communicate design changes to the construction site on a timely basis consistent with the progress of construction Activities.

Design Deliverables

The Contractor shall submit to CDOT all Structure Concept Plans, Release for Construction Documents, Final Design Documents, and As-Built Documents.

The Contractor shall identify on its Contract Schedules when the design deliverables identified above will be submitted to CDOT. The Contractor shall provide two 11 by 17 inch hard copies and one set of electronic files on CD-ROM of the design deliverables to CDOT. As-Built Documents shall show all field installed changes from the Final Design Documents. All changes shall be noted using CADD. Hand-drawn changes will not be Accepted.

The design deliverables shall be delivered to CDOT indexed and clearly marked to indicate the date of issue and stage of development (e.g., Released for Construction, Submittal). The Final Design Documents submittal is required to facilitate CDOT's review and Acceptance of the design while the Contractor still has significant design resources on the Project.

The form of all design deliverables shall include a title block, consistent with standard project drawing format, with the following information included as a minimum:

1. Date of issuance and including all prior revision dates.

2. Contract title and number.

3. The names of the Contractor, Subconsultants, Subcontractors, Suppliers, and manufacturers as applicable.

4. Subject identification by Contractor drawing or Contract reference.

All design deliverables shall be sealed by the Engineer consistent with applicable Legal Requirements. All design deliverables shall include a sufficient blank space, in the lower right corner, just above the title block on the drawings, and in the lower right corner of the title page of specifications and calculations, in which the Contractor's Engineer may indicate the action taken, indicating their review and approval.

If a design deliverable requires review approval from an Outside Agency or permitting authority, the Contractor shall gain written concurrence prior to submitting the design deliverable to CDOT. See Section 6 for requirements for third party agreements.

Section 3 – Quality Management

When calculations accompany drawings in a submittal, the body of the calculations shall contain cross-references to the individual drawing to which the pages of the calculations pertain. Calculations required shall demonstrate conformance with the requirements of the Contract Documents.

The CADD drawings and associated documents shall be organized in a logical manner, have a uniform and consistent appearance, and clearly depict the intent of the design and construction, in addition:

A. All electronic drawings and Roadway modeling for the Project shall be developed in MicroStation/InRoads using CDOT's latest configuration

B. All design deliverables shall be in English units. The Project coordinate system shall comply with the CDOT Survey Manual.

C. The Final Design Documents and As-Built Documents shall be compiled in sequential order. All drawings/plan sets be produced using CDOT's CADD standards. The Final Design Documents and As-Built Documents submittal shall include, as a minimum:

   (1) All design plans.

   (2) Design and design check calculations.

   (3) Design reports.

   (4) Specifications.

   (5) Quantities.

      a. Estimated Quantities for Final Design Documents
      b. Actual Quantities for As-Built Documents

   (6) Shop Drawings, design, and design check calculations

   (7) Electronic CADD files as specified elsewhere in the Contract Documents.

D. The Utility As-Built Documents for Utility work shall be submitted to the Utility Owner for Utility Work constructed by the Contractor, within 90 Days after the Utility Owner has accepted the Utility Work. These electronic deliverables shall conform to those requirements set forth in the Contract for CADD requirements, except as modified by the specific requirements of the individual Utility Owners. The Utility As-Built Documents shall show locations of existing Utilities, structures, trees, streets, and existing highway right-of-way limits. Additionally, the Utility Owner when performing its own construction will provide the Contractor, Utility as-built drawings for their Utility Work showing the foregoing information and with one 11 by 17 inch hard copy and one set of electronic files on CD-Rom to CDOT.

All drawings/plan sets be produced using CDOT's CADD standards. CADD files shall be in accordance with the current CDOT configuration and workspace. All CADD Files shall be

Section 3 – Quality Management

documented in a tabular format describing the path, file name, and description. All As-Built Documents electronic files shall be submitted in *.dgn, *.dtm and *.pdf format.

Document and Data Approval

The Design Quality Manager shall ensure that all deliverables include a signed and dated certification by the originator of the deliverables, that the deliverable is complete, and meets the requirements of the Contract Documents.

Document and Data Changes

The Design Quality Manager shall ensure that any changes to deliverables provided to CDOT as revised are in a format that can enable changes to be readily apparent and trackable (e.g., documents use the redline/strikeout method).

Construction Quality Control

The Quality Control Document (QCD) shall illustrate the process necessary for the Contractor to control the quality of their Construction process in order to produce Work that meets the requirements of the Contract Documents. The Contractor shall be responsible for and shall perform all Materials Quality Control Testing in accordance with their QCD and the requirements of the CDOT Field Materials Manual in effect at the time of advertisement.

Quality Personnel

The Contractor shall designate a Design Quality Manager (DQM), who shall review and approve all design submittals required by CDOT before such submittal.

The Design Quality Manager shall have responsibility for the success of the Contractor's quality program, and shall ensure that authority and responsibilities are defined in the QCD and communicated within their organization.

Field changes to any Contractor designed roadway, bridge, wall, or structural detail shall be stamped by the Contractor's Engineer, and also stamped "Release for Construction" by the Contractor's DQM and submitted to the CDOT Project Engineer 3 days prior to the construction of that portion of the Work may commence. The Contractor shall develop and document procedures, instructions, and process controls to ensure the Work being produced by the Contractor meets the requirements of the Contract Documents.

All construction Quality Control testing personnel performing construction materials testing shall be qualified in accordance with Section CP-10 of the CDOT Field Materials Manual.

The Contractor shall ensure that personnel performing Work shall have the education, training, skills, experience, and certifications to meet the requirements of the Contract Documents. The Contractor shall maintain appropriate personnel records and have them available for examination by CDOT upon request.

Section 3 – Quality Management

Construction Quality Assurance

The Contractor shall be responsible for all quality control testing. CDOT will provide the quality assurance testing and inspections on the Project. All payments for items accepted on the Project shall be based on current CDOT testing and inspection procedures. Minimum sampling and testing frequencies of the product will be based on the CDOT Field Materials Manual and any Project Special Provisions in effect at the time of project advertisement.

The Contractor shall ensure the compatibility of design, construction, installation, traffic management, and public information with CDOT's inspection and testing procedures.

Materials accepted on the basis of a Certificate of Compliance (COC) may be sampled, inspected, and tested by CDOT at any time.

The Contractor shall collaborate with CDOT during the Construction process to ensure that the appropriate Work is produced and requirements are met.

CDOT Independent Assurance Testing (IAT)

CDOT will perform Independent Assurance Tests to ensure that:

1. CDOT Quality Assurance personnel and Contractor Quality Control personnel are trained, certified and demonstrate they understand the test procedures they are performing and;

2. The test equipment used by the Quality Assurance personnel and Contractor Quality Control personnel is calibrated and;

3. Split sample test results correlate.

IAT results may also be used as referee tests to assess statistically significant differences, determined by CDOT in its sole discretion, between Contractor Quality Control tests and CDOT Quality Assurance test results.

Outside Agency Inspections

Outside Agencies such as FHWA or UPRR shall have the right to inspect the Work, provided that the Outside Agency has jurisdiction over the Work and as required by Applicable Law.

Deliverables

At a minimum, the Contractor shall submit the following to CDOT for review, Approval and/or Acceptance:

Section 3 – Quality Management

Deliverable	Acceptance or Approval	Schedule
Quality Control Document	Approval	15 Days following NTP
Quality Control Document Updates	Approval	Within 5 Days of change
Design Progress Meeting Minutes	Acceptance	4 Working Days after Meeting
Other Meeting Minutes (as defined in QCD)	Acceptance	4 Working Days after Meeting
Released for Construction Documents (schedule and quantities portions)	Acceptance	Two Weeks prior to Work
Final Design Documents	Acceptance	As defined in Contract Schedules
As-Built Documents	Acceptance	As defined in Contract Schedules
Utility As-Built Documents	Acceptance	Within 90 Days after Work Completion

Section 4 – Public Information

Public Information Plan

The Contractor shall prepare and maintain a Public Information Plan (PIP) to address the construction impacts of the project to the public and stakeholders. These impacts can be related to, but not limited to, lane closures, detours, durations of impacts, access, construction noise, overall progress, bridge construction, or anything the Contractor and/or CDOT believe important. This plan shall be used throughout the project by the Contractor to manage, document, and implement all aspects of the public information process.

At the preconstruction conference the Contractor shall introduce the Public Information Manager (PIM) for the project and present a public information plan and strategies or methods for communicating project activities. The Contractor shall prepare and submit a preliminary list of stakeholder groups and specific stakeholders that need to receive ongoing communication about the project.

The Contractor's PIM may be the Contractor Project Superintendent if approved by the CDOT Project Engineer after consulting with the Region Public Relations Manager, or it may be another approved project staff person. The PIM shall have good verbal and written communications skills. The identity of the PIM and the PIM's qualifications shall be submitted to the CDOT Project Engineer five days in advance of the preconstruction conference.

The PIM shall be available every calendar day, accessible and on call by cell phone or pager at all times and available upon the request of the CDOT Project Engineer at other than normal working hours. The PIM shall communicate with the CDOT Project Engineer daily.

The Contractor shall establish a Public Information Office (PIO) equipped with a telephone and an answering machine or answering device with the capability to record a message from the caller. This may be a cell phone, but must be a local number. The PIO shall be equipped with a computer and an e-mail account. The PIO may or may not be located within the Contractor's regular office provided that the telephone has a local call number. The PIM shall record a friendly greeting on the project's published phone line each week, updating the message throughout the week, as necessary, depending on changes in work schedule, activities and traffic impacts. The recording shall include each week's forthcoming activities including work days, hours and expected traffic delays, posted detours, project completion date, and office hours. The PIM shall check the answering machine at least twice every calendar day in the early morning and mid-afternoon, including weekends. The PIM shall respond to callers and e-mail inquiries as soon as possible, but at least within 24 hours. The PIM shall keep a logbook of all calls including the contact name, date of contact, date responded, the contact's comments, and the action the PIM took. A copy of this log shall be submitted to the Engineer every two weeks or more frequently, as requested by the Engineer.

The PIM shall maintain communications with businesses and individual residences, commuters, local government entities and all other stakeholders that are directly adjacent to and affected by the project. Using a communications method or strategy approved by the CDOT Project Engineer, the Contractor shall notify stakeholders about the project two weeks

Section 4 – Public Information

prior to beginning any lane restrictions or project activities. Depending upon project impacts, contact with stakeholders may be required daily, weekly, monthly or periodically throughout the duration of the project. Communications tools may include hand flyers, door hangers, newsletters, mailers, using e-mail distribution lists, etc. All public information correspondence and subsequent updates shall be supplied to the CDOT Project Engineer 5 days before distribution.

Stakeholders

The Contractor shall communicate and coordinate with the stakeholders listed below.

1. Delta County
2. Emergency response agencies, such as the Colorado State Highway Patrol, Police Departments, AMR (ambulance), Fire Departments, Hospitals, etc.
3. Commercial vehicle operators, Colorado Motor Carriers Association
4. CDOT Traffic Operation Center
5. School Districts
6. Area Residents and local Homeowner and Property Owner groups within a half mile radius of the project.
7. SH 92 Commuters
8. Utility Owners
9. CDOT
10. UPRR

Each communication tool shall include contact information, PIM's name, office phone, CDOT Web-site address http://www.coloradodot.info/projects/sh92stengelshill with CDOT logo. Cell phone numbers and e-mail addresses shall be provided where service is available. The communication shall include the description of work, lane restrictions, a detour map if warranted, the anticipated start and completion dates, hours of operation and work schedule, and a Slow for the Cone Zone message.

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 PIM'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.

An individual project Web-site has been developed and will be hosted on CDOT's web site using the CDOT template. The Contractor shall coordinate with the Region Public Relations Manager to update the website in accordance with the CDOT standard template. The site will be revised as directed by the CDOT Project Engineer. The Contractor shall provide updates to the CDOT Project Engineer for acceptance and addition to the website.

Section 4 – Public Information

Public Information Services Contact Sheet

Owners:

Colorado Department of Transportation Resident Engineer
Name: Ronald Alexander, P.E.
Address: 2424 North Townsend Avenue, Montrose CO, 81401
Phone: (970) 683-6420 Fax: (970) 249-6018 Cell: (970) 596-1554
Email: ronald.b.alexander@state.co.us

Colorado Department of Transportation, Region Public Relations Manager
Name: Tracy Trulove
Address: 202 Centenial St, Glenwood Springs CO, 81601
Phone: (970) 384-3371 Cell: (970) 366-2502
Email: tracy.trulove@state.co.us

Emergency Information Dissemination – Telephone List

The Contractor shall establish and manage an emergency response contact list. All appropriate personnel shall be included on this list for immediate response in the event of an emergency. The list shall be divided into areas of expertise so the proper people are called for specific emergency situations. CDOT Project Engineer, CDOT public information staff, and the Contractor's Project Manager shall be included on the list for notification of any emergency that may arise. The Contractor shall develop and maintain a contact list of emergency service providers as part of this list. Contractor shall submit the emergency response telephone list to the CDOT Project Engineer for Acceptance prior to beginning any construction activities and when any changes are made to the list.

Section 4 – Public Information

Deliverables
At a minimum, the Contractor shall submit the following to CDOT for review, Approval and/or Acceptance:

Deliverable	Acceptance or Approval	Schedule
PIP Plan	Acceptance	Prior to Construction and maintain as needed
Communication Tools	Approval	One week before distribution to public
Communication log	Acceptance	Maintain as needed
Telephone list	Acceptance	Maintain as needed
Website Updates	Acceptance	Maintain as needed
Emergency Response Contact List	Acceptance	Prior to Construction and maintain as needed

Section 5 – Environmental Requirements

Environmental Requirements

The Contractor shall comply with all environmental laws, regulations, approvals, and conditions required for the project, whether obtained by CDOT or by the Contractor. Actions listed within each environmental resource below are clarifications of, and additions to; CDOT Standard Specifications for Road and Bridge Construction, dated 2011, CDOT Project Special Revisions developed and Standard Special Revisions.

The Contractor shall prepare an Environmental Compliance Work Plan for the Project, specifically identifying all of the environmental compliance requirements for the Project and the Contractor's approach for complying with the requirements. The Environmental Compliance Work Plan shall include a table to track milestones including Contractor and CDOT roles, due dates, and completion dates. The Environmental Compliance Work Plan (ECWP) shall be submitted to CDOT for Acceptance within 60 Days after Notice to Proceed for Design. The Contractor shall provide an environmental compliance manager. It is acceptable for the environmental compliance manager to serve as the erosion control supervisor. The compliance manager shall lead an environmental review meeting with CDOT environmental staff to discuss environmental issues every two weeks for first 60 days following Notice to Proceed for design, and at least monthly thereafter. The compliance manager shall have the authority to stop construction if Work activities jeopardize environmental laws, policy, or human health and safety. The ECWP tracking table and documentation of any pertinent events or discussions (including, but not limited to, meeting minutes of environmental review meetings) that occur during the environmental field reviews will be submitted to CDOT for Acceptance every month prior to Approval of progress payment.

Environmental Resources Requirements

Air Quality/Fugitive Dust

To minimize air quality impacts, the Contractor shall incorporate dust control techniques such as watering disturbed construction areas or as described in Standard Specification 209 – "Watering and Dust Palliatives".

Construction Noise

The Contractor shall comply with all applicable local sound control and noise ordinances and regulations, including the use of variances. If permits are required, they shall be acquired prior to construction.

Threatened and Endangered Species

CDOT completed a Threatened and Endangered Species assessment in July, 2012 and concluded that no threatened and endangered species are likely to be impacted.

Section 5 – Environmental Requirements

Prairie Dog Mitigation

Prairie dog burrows exist within the Project limits. A field survey conducted with CDOT and the Bureau of Land Management (BLM) in September, 2013 delineated 3 sites in which existing burrows were found. The station limits and action to be taken by the contractor are as follows:

Site 1: STA 380+00 – 390+00 LT/RT: Considered inactive colony. The Contractor shall surface roughen to a depth not to exceed 6 inches where the Project footprint covers existing burrows. This work may be in completed concurrently with the clearing and grubbing operations and take place 5 days prior to earthwork activities. The cost for this operation shall be included in the Work.

Site 2: STA 392+00 – 403+00 LT/RT: Considered active colony. The Contractor shall surface roughen to a depth not to exceed 6 inches where the Project footprint covers existing burrows. This work may be in completed concurrently with the clearing and grubbing operations and take place 5 days prior to earthwork activities. In the event that prairie dogs do not relocate the Contractor shall humanely euthanize and deliver to a raptor and/or Black footed ferret program as per CDOT's Black tailed Prairie Dog policy. The cost for this operation shall be included in the Work.

Site 3: STA 409+00 – 413+00 LT: Considered active colony. The Contractor shall surface roughen to a depth not to exceed 6 inches where the Project footprint covers existing burrows. The Contractor shall also provide silt fence at 50 ft intervals at a 45 degree angle from centerline within the colony to promote relocation. This work may be in completed concurrently with the clearing and grubbing operations and take place 5 days prior to earthwork activities. In the event that prairie dogs do not relocate the Contractor shall humanely euthanize and deliver to a raptor and/or Black footed ferret program as per CDOT's Black tailed Prairie Dog policy. The cost for this operation shall be included in the Work.

Station locations are based on the current alignment as show in the Reference Documents.

Western Burrowing Owls

Prior site surveys conducted by CDOT in July, 2012 have shown no signs of burrowing owls. However, prior to construction and prairie dog euthanization procedures the Contractor's biologist shall conduct a burrowing owl survey within the project disturbance limits. This survey shall be conducted in concurrence with the Protection of Migratory Birds field investigation as outlined in Project Special Revision 240. The reporting requirements shall also follow the requirements as set forth in Project Special Revision 240. The survey will be required for any construction activities occurring between March 15th and October 31st. The cost for this operation shall be included in the Work.

Section 5 – Environmental Requirements

If burrowing owls are confirmed to be present the Contractor is directed to:

Monitor the activities of the owls, noting and marking which burrows they are using. When all active burrowing owl burrows have been located and marked, construction activity may proceed within areas greater than 150 ft from the burrows until the owl has moved out, at which time all construction activities may commence.

Delays due to Burrowing Owl activity may result in a non-compensable time extension Contract change order issued by CDOT.

Wetlands

A Wetland Delineation Report (dated March 21, 2013) has been completed for the project. It is anticipated that this project will permanently impact approximately 1.08 acres of wetlands. During final design and following construction, the contractor must provide CDOT with information on the actual wetland impacts. If actual wetland impacts exceed these amounts, then the contractor would be responsible for modification of the 404 Permit. Construction activity shall not commence prior to final 404 Permit approval. See References for Wetland Reports.

Archaeology and Paleontology

A review of the project area for archaeological and/or paleontological resources has been completed. There are no known archaeological sites within or near the project areas. Archaeological resource monitoring is not required. However, if any archaeological resources are uncovered during construction the Contractor shall immediately cease work and notify the CDOT Project Engineer.

If archaeological or paleontological resources are uncovered during construction, steps may need to be taken to document, protect, and/or remove the resources as directed by CDOT. The Contractor shall not resume work within the area until receiving written notification from the CDOT Project Engineer.

Historic Resources

A review of the project area for historical resources has been completed. With the exception of the Railroad, there are no known historic sites within or near the project areas.

Vegetation

Vegetation replacement shall follow Section 17.

Section 5 – Environmental Requirements

Environmental Permits

This work may require several environmental permits from various Federal, State and Local agencies.

CDOT and Contractor Obtained Environmental Permits

CDOT Obtained Permits:

Permits/Approvals	Permitting Agency
404 Permit	US Army Corps of Engineers
SB 40 Clearance	Colorado Division of Wildlife

404 Permit

CDOT has completed coordination with the US Army Corps of Engineers (Corps). This project is covered under a nationwide permit. Should the Contractor's design result in an increase in impacts to Waters of the US (wetlands or open waters associated with Big Gulch Creek), then it shall be the Contractor's responsibility to obtain all necessary agency approvals for permit modifications. Modifications of any permits previously obtained by CDOT shall be subject to CDOT Approval prior to submission to the agency responsible for the permit approval. Any additional mitigation associated with these changes will not be paid for separately but shall be included in the Work.

SB 40 Clearance

CDOT will notify Colorado Parks and Wildlife about this project per Senate Bill 40 (SB 40). A copy of the SB40 requirements and project specific materials is provided in the Reference Documents.

SB 40 Construction Requirements:

Aquatic Invasive Species

Aquatic invasive species may be spread by construction equipment. The following BMPs developed by the CDOW shall be observed to minimize the risk of spreading of New Zealand mud snails, zebra mussels, quagga mussels, whirling disease, and any other aquatic invasive species. If heavy equipment to be used for the project has previously been used in another stream, river, lake, pond, or wetland, then one of the following disinfection practices is necessary prior to construction to prevent the spread. These practices are also necessary after project completion and prior to this equipment

Section 5 – Environmental Requirements

being used in another stream, river, lake, pond, or wetland. Also, clean any hand tools, boots, or other equipment that will be used in water with one of the below options. The Contractor shall provide Certification of Compliance to the Project Engineer.

1. Remove all mud and debris from equipment (tracks, turrets, buckets, drags, teeth, etc.) and spray/soak equipment a 1:15 solution of Sparquat institutional cleaner and water. Keep equipment moist for at least 10 minutes.

2. Remove all mud and debris from equipment (tracks, turrets, buckets, drags, teeth, etc.) and spray/soak equipment with water greater than 140 degrees Fahrenheit for at least 10 minutes.

Should the Contractor's design necessitate a modification of the SB 40 clearance obtained by CDOT for the project, then it shall be the Contractor's responsibility to obtain all necessary agency approvals for permit modifications. Modifications of permits previously obtained by CDOT shall be subject to CDOT Approval prior to submission to the agency responsible for the permit approval. Any additional mitigation associated with these changes will not be paid for separately but shall be included in the Work.

Contractor Obtained Permits:

The Contractor shall be responsible for obtaining all governmental and agency permits required for the described Work, not otherwise obtained by CDOT, including but not limited to the following environmental permits:

Permits/Approvals	Permitting Agency
Construction Dewatering Permit	CDPHE Water Quality Control Division
Colorado Discharge Permit System (CDPS) Stormwater Construction Permit (SCP)	CDPHE Water Quality Control Division

The Contractor shall deliver copies of these permits to the Engineer.

Colorado Discharge Permit System-Stormwater Construction Permit (CDPS-SCP)

The Contractor shall be responsible for all stormwater permit requirements until the permit is closed. This includes the maintenance of all BMPs and seeded areas until final stabilization has been achieved (See Section 17), all temporary BMPs have been removed, and there is no potential for erosion. See Section 17 for a complete list of stormwater-sediment and erosion

Section 5 – Environmental Requirements

control requirements. The Contractor shall review and incorporate the latest requirements from CDOT for erosion and sediment control.

Construction Dewatering Permit

It is anticipated that dewatering will be required during construction at the Big Gulch location. The Contractor shall obtain the Construction Dewatering Permit from the Colorado Department of Public Health and Environment for any dewatering of ground water during construction. The Contractor shall obtain this permit at least 30 days prior to the start of discharge. The Contractor shall assume all responsibilities of the permit.

Deliverables

At a minimum, the Contractor shall submit the following to CDOT for review, Approval and/or Acceptance:

	Acceptance or Approval	Schedule
Environmental Compliance Work Plan	Acceptance	Within 60 Days of NTP
Environmental Compliance Work Plan Updates	Acceptance	Quarterly
Manifests/Disposal records	Acceptance	After Demolition
Stormwater Management Plan (SWMP) and Site Map	Acceptance	Prior to Construction
Stormwater Management Plan Notebook	Acceptance	Prior to Construction
Spill Prevention, Control, and Countermeasure Plan (SPCC)	Acceptance	Prior to Construction
Colorado Discharge Permit System (CDPS) Stormwater Construction Permit (SCP)	Acceptance	Prior to Construction
Fugitive Dust Permit	Acceptance	Prior to Construction
Construction Dewatering Permit	Acceptance	30 Days Prior to Dewatering

Section 5 – Environmental Requirements

Project Special Provisions

SECTION 240
PROTECTION OF MIGRATORY BIRDS
BIOLOGICAL WORK PERFORMED BY THE CONTRACTOR'S BIOLOGIST

Section 240 is hereby added to the Standard Specifications for this project as follows:

DESCRIPTION

240.01 This work consists of protecting migratory birds during construction.

MATERIALS AND CONSTRUCTION REQUIREMENTS

240.02 The Contractor shall schedule clearing and grubbing operations and work on structures to avoid taking (pursue, hunt, take, capture or kill; attempt to take, capture, kill or possess) migratory birds protected by the Migratory Bird Treaty Act (MBTA). The Contractor shall retain a qualified wildlife biologist for this project. The wildlife biologist shall have a minimum of three years experience conducting migratory bird surveys and implementing the requirements of the MBTA. The Contractor shall submit documentation of the biologist's education and experience to the Engineer for acceptance. A biologist with less experience may be used by the Contractor subject to the approval of the Engineer based on review of the biologist's qualifications.

The wildlife biologist shall record the location of each protected nest, bird species, the protection method used, and the date installed. A copy of these records shall be submitted to the Engineer.

(a) *Vegetation Removal.* When possible, vegetation shall be cleared prior to the time when active nests are present. Vegetation removal activities shall be timed to avoid the migratory bird breeding season which begins on April 1 and runs to August 31. All areas scheduled for clearing and grubbing between April 1 and August 31 shall first be surveyed within the work limits for active migratory bird nests. The Contractor's wildlife biologist shall also survey for active migratory bird nests within 50 feet outside work limits. Contractor personnel shall enter areas outside CDOT right of way only if a written, signed document granting permission to enter the property has been obtained from the property owner. The Contractor shall document all denials of permission to enter property. The Contractor shall avoid all active migratory bird nests. The Contractor shall avoid the area within 50 feet of the active nests or the area within the distance recommended by the biologist until all

Section 5 – Environmental Requirements

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SECTION 240
PROTECTION OF MIGRATORY BIRDS
BIOLOGICAL WORK PERFORMED BY THE CONTRACTOR'S BIOLOGIST

nests within that area have become inactive. Inactive nest removal and other necessary measures shall be incorporated into the work as follows:

1. *Tree and Shrub Removal or Trimming.* Tree and shrub removal or trimming shall occur before April 1 or after August 31 if possible. If tree and shrub removal or trimming will occur between April 1 and August 31, a survey for active nests shall be conducted by the wildlife biologist within the seven days immediately prior to the beginning of work in each area of tree and shrub removal or trimming. The survey shall be conducted for each phase of tree and shrub removal or trimming.

   If an active nest containing eggs or young birds is found, the tree or shrub containing the active nest shall remain undisturbed and protected until the nest becomes inactive. The nest shall be protected by placing fence (plastic) a minimum distance of 50 feet from each nest to be undisturbed. This buffer dimension may be changed if determined appropriate by the wildlife biologist and approved by the Engineer. Work shall not proceed within the fenced buffer area until the young have fledged or the nests have become inactive.

   If the fence is knocked down or destroyed by the Contractor, the Engineer will suspend the work, wholly or in part, until the fence is satisfactorily repaired at the Contractor's expense. Time lost due to such suspension will not be considered a basis for adjustment of time charges, but will be charged as contract time.

2. *Grasses and Other Vegetation Management*. Due to the potential for encountering ground nesting birds' habitat, if work occurs between April 1 and August 31, the area shall be surveyed by a wildlife biologist within the seven days immediately prior to ground disturbing activities.

   The undisturbed ground cover to 50 feet beyond the planned disturbance, or to the right of way line, whichever is less, shall be maintained at a height of 6 inches or less beginning April 1 and continuing until August 31 or until the end of ground disturbance work, whichever comes first.

Section 5 – Environmental Requirements

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SECTION 240
PROTECTION OF MIGRATORY BIRDS
BIOLOGICAL WORK PERFORMED BY THE CONTRACTOR'S BIOLOGIST

If birds establish a nest within the survey area, an appropriate buffer of 50 feet will be established around the nest by the contractor biologist. This buffer dimension may be changed if determined appropriate by the CDOT biologist and approved by the Engineer. The Contractor shall install fence (plastic) at the perimeter of the buffer. Work shall not proceed within the buffer until the young have fledged or the nests have become inactive.

If the fence is knocked down or destroyed by the Contractor, the Engineer will suspend the work, wholly or in part, until the fence is satisfactorily repaired at the Contractor's expense. Time lost due to such suspension will not be considered a basis for adjustment of time charges, but will be charged as contract time.

The Contractor's Wildlife Biologist will conduct raptor nest surveys within 0.5 mile of the construction site prior to the start of construction and prior to each construction phase. This survey can be done with binoculars. If construction activities are located within the Colorado Division of Wildlife (CDOW) recommended buffer zone for specific raptors, "NO WORK" zones shall be established according to the CDOW standards or by the CDOT Wildlife Biologist in consultation with the CDOW around active sites during construction. The "NO WORK" zone shall be marked with either fencing or signing. Work shall not proceed within a "NO WORK" zone until the CDOT Biologist has determined that the young have fledged or the nest is unoccupied.

3. *Work on structures*. The Contractor shall prosecute work on structures in a manner that does not result in a taking of migratory birds protected by the Migratory Bird Treaty Act (MBTA). The Contractor shall not prosecute the work on structures during the primary breeding season, April 1 through August 31, unless he takes the following actions:

(1) The Contractor shall remove existing nests prior to April 1. If the Contract is not awarded prior to April 1 and CDOT has removed existing nests, then the monitoring of nest building shall become the Contractor's responsibility upon Notice to Proceed.

(2) During the time that the birds are trying to build or occupy their nests, between April 1 and August 31, the Contractor shall monitor the structures at least once every three days for any nesting activity.

(3) If the birds have started to build any nests, they shall be removed before the nest is completed. Water shall not be used to remove the nests if nests are located within 50 feet of any surface waters.

Section 5 – Environmental Requirements

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SECTION 240
PROTECTION OF MIGRATORY BIRDS
BIOLOGICAL WORK PERFORMED BY THE CONTRACTOR'S BIOLOGIST

(4) Installation of netting may be used to prevent nest building. The netting shall be monitored and repaired or replaced as needed. Netting shall consist of a mesh with openings that are ¾ inch by ¾ inch or less.

If an active nest become established, i.e., there are eggs or young in the nest, all work that could result in abandonment or destruction of the nest shall be avoided until the young have fledged or the nest is unoccupied as determined by the wildlife biologist and approved by the Engineer. The Contractor shall prevent construction activity from displacing birds after they have laid their eggs and before the young have fledged.

If the project continues into the following spring, this cycle shall be repeated. When work on the structure is complete, the Contractor shall remove and properly dispose of netting used on the structure.

(c) *Taking of a Migratory Bird.* The taking of a migratory bird shall be reported to the Engineer. The Contractor shall be responsible for all penalties levied by the U. S. Fish and Wildlife Service (USFWS) for the taking of a migratory bird.

Section 6 - Third Party Agreements

General

The Contractor shall be responsible for obtaining all third-party approvals required to complete the Work, except as otherwise specified in the Contract Documents. Third-party coordination and approvals will be required from, but not limited to, the following agencies: Railroad, Irrigation Ditch Companies, Public Utility Owners and Private Utility Owners. Utility Company requirements are addressed in Section 7, Utility Relocations. Coordination and approval requirements of the Railroad and Irrigation Ditch Companies are addressed in this Section.

Railroad

The Project includes Work on, over and adjacent to the Union Pacific Railroad (Railroad) Right-of-Way (ROW) and/or properties on, over or adjacent to the tracks, wire lines, and other facilities of the Railroad. This Section provides requirements applicable to Work performed on, over or adjacent to the Railroad ROW. Anticipated Work on, over or adjacent to Railroad ROW is limited to construction work necessary for the construction of the SH 92 bridge structure foundations, piers, crash walls, abutments, roadway retaining walls and all other substructure and superstructure elements. The Contractor shall abide by and comply with the requirements of the Railroad, as well as those requirements specified herein.

The Contractor shall comply with all rules and regulations prescribed by the Railroad as to the proper manner of protecting the tracks (and the traffic moving thereon), telephone, telegraph and signal wires, and other property of the Railroad or their tenants at and in the vicinity of the Project during the time such Work is being performed. Compliance with the Railroad rules and regulations shall include execution of agreements required by the Railroad.

Applicable Standards

The design and construction of the Railroad Work for the Project shall be in accordance with the Railroad's written specifications, standards of practice (which may include design format), and construction methods that are current at the Proposal Due Date. The Contractor shall obtain all such written specifications, standards of practice, and construction methods from the Railroad. This information can be obtained at www.uprr.com . In the event of a conflict between the requirements of the Railroad and the requirements of the Contract Documents, CDOT, at its sole discretion, will determine which shall govern. The Contractor shall be responsible for resolution of any unresolved ambiguity prior to proceeding with any Railroad Work.

The Contractor shall meet the requirements included in the final executed Construction and Maintenance Agreement (C&M Agreement) between CDOT and the Railroad created for this Work. The Draft C&M Agreement for this project is included in the Reference Documents for referral.

The Contractor shall meet the requirements included in the Railroad's Contractor's Right of Entry Agreement (CROE Agreement) entered into by the Contractor for Work to be performed by the Contractor within Railroad ROW.

Section 6 - Third Party Agreements

Administrative Requirements

Within 10 Days after NTP for design, the Contractor shall notify the Railroad Manager of Industry and Public Projects:

Mr. Sherman Spear
Manager Industry & Public Projects
Union Pacific Railroad
1400 West 52nd Avenue
Denver, CO 80221
Phone: (303) 405-5039
FAX: (402) 997-3942

And, Railroad Manager of Track Maintenance:

Mr. Matthew Johnson
Manager Track Maintenance
Union Pacific Railroad
2790 D Road
Grand Junction, CO 81501
Phone: (970) 548-4254
FAX: (402) 233-3011
Cell: (402) 216-2305

The Contractor shall meet with the Railroad and CDOT as soon as practicable after NTP for design to review all Railroad points of concern and other items that may affect the Schedule. The Contractor shall identify critical Activities and sequences as they affect Railroad operations, and shall plan to effectively mitigate Railroad impacts.

The construction of the overhead grade separation structure on UPRR Right of Way will require CDOT to negotiate and execute a Construction and Maintenance Agreement with the Railroad prior to construction. The Contractor shall support CDOT in this effort by preparing any Contract exhibits and/or information requested by CDOT or the Railroad. The Contractor shall allow for appropriate duration in the Project Schedule for contract negotiation and execution, and shall provide the supporting documentation in a timely fashion to CDOT so as not to impact the Project Schedule.

All Railroad facilities requiring modifications shall be designed and constructed by the Railroad.

Before commencing any Work on Railroad properties, the Contractor shall enter into agreement with the Railroad in the form of a Contractor's Right of Entry Agreement (CROE). An example of the CROE, including Exhibits B, C and D, the Contractor's Endorsement and a copy of the application for a CROE is included with the Reference Documents. All costs associated with applying for and complying with CROE Agreement, including required insurance coverage, clerical, administrative, and handling expenses in connection with the processing of this agreement, shall be included in the Work.

Section 6 - Third Party Agreements

Previous Approvals and Comments

The Railroad has previously reviewed conceptual plans for this project and provided comments on the 30% plan submittal. They have also provided comments and/or concurrence for variance requests as indicated in the Reference Documents. Copies of these documents are included with the Reference Documents and include the following:

- UPRR Conceptual Submittal and Variance Request
- UPRR Comments on Conceptual Submittal
- UPRR Comments on 30% plans; email dated 2-1-13
- UPRR Comments on 30% plans; email dated 4-16-13
- CDOT response to UPRR 30% plan comments

Railroad Insurance

The Contractor shall comply with the provisions for Railroad insurance as specified in the executed agreements or permits with the Railroad and in the terms and conditions of the Contract. See Exhibit C of the Contractor's Right of Entry Agreement in the Reference documents for the insurance requirements. All such insurance shall be maintained so long as work shall continue in the vicinity of Railroad property.

If any part of the Contract work on the Railroad's properties is sublet, similar insurance shall be provided by or in behalf of each subcontractor.

Flagging and Inspection

Any Work within, or Work Equipment that could potentially fall within, 25 feet of the centerline of the nearest track rail shall require a Railroad flagger. The Contractor shall notify the Railroad per the executed agreement with the Railroad to arrange for required flagging services. The Railroad flagger shall provide services for the Railroad only. The Contractor shall be responsible to appropriately notify the Railroad regarding flagging start and end dates for work on the Railroad ROW per the executed agreement. Railroad flagging that occurs as a result of the failure of the Contractor to provide timely notice when flagging will not be required, per the executed agreement, will not be paid for by CDOT but will be the responsibility of the Contractor. The Contractor shall provide advance notice to the Railroad, per the executed agreement, when all work on the Railroad ROW is scheduled for completion to provide for termination of Railroad flagger services.

During the period of construction, all flagging and protective services shall be performed strictly in accordance with directives and instructions issued by the Railroad. The Contractor shall confer with the Railroad for the times, locations, and manner of such protective measures. The Contractor shall include the Railroad flaggers in all its regularly scheduled safety meetings. If the Contractor does not comply with the above requirements, the Railroad may post a flagger or flaggers, as it deems necessary, for the duration of the Project. The Railroad utilizes independent consultant services to inspect and verify that any and all work on Railroad ROW

Section 6 - Third Party Agreements

is being undertaken in accordance with Railroad safety requirements. Failure to comply with Railroad safety requirements may result in a stop Work order.

Cost for Flagging, Inspection

The cost of Railroad flagging and inspection will be paid by CDOT in accordance with Section 16 – Traffic Control. The Contractor shall keep a log of actual time that the Railroad personnel are flagging. Copies of the log shall be submitted to CDOT on a weekly basis. The Railroad will bill the State directly for Railroad flagging and inspection, and other Railroad costs incurred on the Project. Costs incurred however as a result of Contractor's non-compliance to the requirements under "Flagging and Inspection" item in this Section shall be the Contractor's responsibility.

Authority of Railroad Flaggers and Inspectors

The Railroad flaggers and inspectors shall have the right to direct the Contractor to stop Work on, over or adjacent to Railroad property, if the Railroad in its sole discretion determines that the Work being performed is hazardous to Railroad property and/or operations. The Railroad will give immediate notice to CDOT of any Work stoppage. The Contractor, working with CDOT, shall be responsible for resolving to the Railroad's satisfaction the problems resulting in the Work stoppage. The Contractor shall accommodate any and all requests made by the Railroad that serve the purpose of avoiding hazards to Railroad property and/or operations. Neither the Railroad nor CDOT will have any liability to the Contractor for costs or delays associated with such Work stoppage or requirements associated with avoidance or hazardous situations.

Utility Crossings

The Railroad is not responsible for Utilities on Railroad ROW. The Contractor shall locate all Utilities on Railroad ROW within the immediate vicinity of the Work. The Contractor shall certify to the Railroad that all the Utilities on Railroad ROW and within the immediate vicinity of the Work have been identified and properly located.

Design Reviews

The Railroad will review design plans for Work on the Railroad's property. Railroad review is separate and independent from CDOT oversight. The Contractor shall coordinate the required Railroad design reviews with the CDOT Utility Engineer, Rob Martindale. His contact information is shown below. All plans submitted for Railroad review and approval shall be in English units. All documents shall be delivered to the CDOT Utility Engineer with a copy to the CDOT Project Engineer. The Contractor shall allow Railroad review time per the Burlington Northern Santa Fe (BNSF) Railway – Union Pacific Railroad Guidelines for Railroad Grade Separation Projects that are included with the Reference Documents. The cost of producing plans for design review shall not be paid separately but shall be included in the cost of the Work.

Section 6 - Third Party Agreements

CDOT shall obtain Railroad Approval in writing of design plans for all of the design elements of the Work on the Railroad's property and will promptly copy the Contractor on all correspondence to or from the Railroad.

CDOT has executed an existing Task Order with the UPRR and will assume the payment responsibility to the UPRR for their review time.

Rob Martindale
CDOT Region 3 Utility Engineer
222 South Sixth Street, Room 317
Grand Junction, CO 81501
Office: 970-683-6209
Cell: 970-210-5913
rob.martindale@state.co.us

Construction Requirements

The Contractor shall comply with the rules and regulations of the Railroad or the instructions of its representatives in relation to the proper manner of protecting the tracks and property of the Railroad and the traffic moving on such tracks, as well as the wires, signals, and other property of the Railroad, its tenants, or licensees, at and in the vicinity of the Work during the period of construction.

All construction Work within the Railroad ROW and/or properties shall be performed during daylight hours unless authorized otherwise by the Railroad.

The Contractor shall coordinate with the Railroad prior to beginning any construction on or adjacent to the Railroad ROW. The Contractor shall schedule and hold a Railroad pre-construction conference. Working windows for demolition and construction shall be coordinated with the Railroad and Railroad flaggers.

The Contractor shall provide written notification to the Railroad at least 30 Days in advance of the date on which the Contractor expects to begin Work on Railroad properties. All notices and correspondence with the Railroad shall contain the Project number and location. Copies of such agreements, notices, and correspondence shall also be submitted to CDOT.

The Contractor shall obtain Railroad agreement in writing, in advance, on methods and procedures covering all Work on the Railroad's property. Upon completion of the Work, the Contractor shall remove from the premises of the Railroad ROW all Equipment, surplus Material, and debris, leaving such premises in a neat condition satisfactory to the Railroad.

If the Contractor employed upon the Railroad's property performs the Work thereon contrary to the Railroad-approved plans, specifications, and requirements of the Contract Documents, or if the Contractor performs the Work on the Railroad's property in a manner deemed hazardous by the Railroad (to its property and facilities or the safe and expeditious movement of its

Section 6 - Third Party Agreements

traffic), the Railroad will have the right to stop the Work on the Railroad's property until the acts or omissions of the Contractor have been fully rectified to the satisfaction of the Railroad.

The Contractor shall be responsible to the Railroad and its tenants for all damages for delays that may be sustained by the Railroad, its tenants, their employees, or freight in their care caused by any interference that could have been avoided by proper handling of the Project Work.

All of the limitations and obligations imposed upon the Contractor by this Section shall apply with equal force and effect to any Subcontractor performing any Project Work for the Contractor upon the Railroad's ROW. The Contractor shall be primarily liable and responsible to the Railroad for all acts or omissions of any Subcontractor employed upon the Railroad's ROW.

Nothing herein contained shall be construed to preclude the Railroad from proceeding against the Contractor and Subcontractors individually or collectively.

The Contractor shall perform its Work in such manner and at such times as shall not to endanger or interfere with the safe operation of the tracks and property of the Railroad and the traffic moving on such tracks, as well as wires, signals, and other property of the Railroad, its tenants or licensees, at or in the vicinity of the Work. The Contractor shall not pile or store any Materials, tools, or park any Equipment, when not in use, closer to the center of nearest railroad track than permitted by the following clearances:

1. 25 feet, 0 inches horizontally from nearest rail
2. 23 feet, 4 inches vertically above top of rail

Falsework, forms, bracing or other construction supports, driven piles, etc., shall be no closer to the center of the nearest railroad track than permitted by the following temporary construction clearances:

1. 12 feet, 0 inches horizontally from nearest rail
2. 21 feet, 0 inches vertically above top of rail

Any proposed variance of the above clearances shall be submitted by the Contractor to the Railroad, the Public Utilities Commission if applicable, and to CDOT; and the variance shall not be undertaken until approved by the Railroad and until CDOT has obtained any necessary authorization from any governmental body or bodies having jurisdiction. No extra compensation will be allowed in the event the Contractor's Work is delayed pending Railroad approval and Governmental Approval.

If required, temporary crossings at grade of the Railroad's tracks or roadways or unloading pits on the Railroad's ROW will only be constructed by the Railroad. If required, the Contractor shall execute a temporary crossing agreement with the Railroad. The Contractor shall only enter Railroad property through routes approved by the Railroad. The Contractor shall

Section 6 - Third Party Agreements

maintain any such crossings so established in good condition at all times; shall keep flange-ways free of ice, snow, dirt, rock and debris; and shall install, operate, maintain and remove in a manner satisfactory to the Railroad suitable barricades adequate to prevent unauthorized vehicles or Equipment from using such crossings or roadways. All costs and expenses for installation, maintenance, and operation of any such crossings or roadways and barricades, whether the Work performed by the Railroad or by the Contractor, shall be included in the Work, notwithstanding anything elsewhere contained herein. The Contractor shall not at any time cross the Railroad's tracks with vehicles or Equipment of any kind or character, except at existing public crossings or at crossings established, as provided for in this paragraph.

The Contractor shall provide positive drainage along the Railroad at all times during and at the end of construction in the area.

Work shall be performed in accordance with plans and specifications approved by the Railroad and in such manner and at such times as shall not endanger or interfere with the safe operation of the tracks and other facilities. The requirements of the Railroad and the instructions of its representatives shall be complied with relating to the proper manner of protecting the tracks, pipelines, wire lines, signals, and all other property at said location; the traffic moving on such tracks; and the removal of tools, Equipment, and Materials.

The Contractor shall not pursue any levies, liens, or encumbrances of any nature whatsoever against Railroad property, and shall promptly remove any lien against Railroad property arising from performance of Work hereunder by the Contractor or any Subcontractor; and if not removed within 20 Days, the Railroad may act to remove same and all the costs shall be paid by the Contractor.

Railroad representatives, conductors, flagmen, or watchmen will be provided by the Railroad to protect its facilities, property, and movements of its trains or engines when, in the opinion of the Railroad's representative, they are necessary because of the Contractor's operations while working on or adjacent to Railroad property or its tracks.

The cost of all personnel deemed necessary by the Railroad and provided by the Railroad for the protection of the Railroad facilities and trains during the period of constructing the Project, and the cost of installing protective devices in the case of impaired clearance, as above specified, shall be borne by CDOT in accordance with Section 16 – Traffic Control.

At the request of the Railroad, the Contractor shall remove from the Railroad premises any employee of said Contractor or any Subcontractor who fails to conform to the instructions of the Railroad's representative. All Work on the Railroad premises shall be suspended until such request of the Railroad is met. The Contractor shall indemnify the Railroad against any claim arising from the removal of any such employee from the Railroad premises.

Upon completion of the Work to be performed on Railroad property, the Contractor shall promptly remove from Railroad property all tools, Equipment, and Materials placed thereon by the Contractor or the Contractors agents. The Contractor shall restore said property to the

Section 6 - Third Party Agreements

same state and condition as when the Contractor entered thereon and shall leave said property in a clean and presentable condition satisfactory to the Railroad.

The Contractor shall provide written notice to the Railroad that the Work has been completed within 10 Days following completion and acceptance of such Work. All notices and correspondence with the Railroad shall contain the Project number and location. Copies of such agreements, notices, and correspondence shall also be submitted to CDOT.

Colorado Public Utilities Commission (PUC)

Per PUC Regulations (4 CCR 723-7:7203), only the roadway or railroad authority in highway-rail crossings may petition or apply to the PUC. CDOT will apply for the highway-rail crossing PUC authorizations necessary for the Project. The Contractor shall support CDOT in these efforts by the following:

1. CDOT shall be responsible for preparing all applications to be submitted to the PUC.
2. The Contractor shall be responsible for assisting and supporting CDOT as needed by providing all supporting documentation, and preparing exhibits to the satisfaction of CDOT and the PUC.
3. The Contractor shall attend meetings with appropriately qualified staff and cooperate with CDOT and the PUC, as reasonable and requested by CDOT.
4. The Contractor shall prepare and coordinate any post application exhibits and/or information requested by the PUC, including providing technical expertise at any PUC legal proceedings, as requested by CDOT.
5. The Contractor shall allow for appropriate PUC approval durations in the Project schedule and shall provide the supporting documentation in a timely fashion to CDOT so as not to impact the Project Schedule. Any delays or increase in costs of the completion of the Project caused by the failure of or delay by the Contractor to provide CDOT the supporting documentation shall be the responsibility of the Contractor.
6. The cost to provide CDOT with the supporting documentation and/or exhibits shall not be paid for but shall be included in the cost of the Work.

Irrigation Ditch Companies

The Project includes Work on irrigation facilities owned by two land owners on and adjacent to the project as described below under existing and proposed irrigation facilities. This Section provides requirements applicable to Work performed upon or adjacent to these irrigation facilities. Anticipated Work on or adjacent to the Irrigation Owners facilities is limited to the construction of structures and/or ditches that carry each owners flow and access modifications required to restore maintenance access for irrigation operations impacted by the Work and the proposed highway facilities. The Irrigation Owner representatives contact information is included in the Utility contact information in Section 7 – Utilities.

Section 6 - Third Party Agreements

Existing and Proposed Irrigation Facilities

Station 446+80
Irrigation Owner – Holder
Description – The owner has an existing irrigation siphon that crosses SH 92 at Station 446+80. The current design, as shown in the Reference Documents, includes a design for a replacement 18 inch siphon pipe with headwalls. This design has been approved by CDOT and the Irrigation Owner and no further approvals will be required unless the Contractor proposes something other than what has already been approved. A copy of the approved Irrigation Agreement and siphon design is included in the Reference Documents.

Applicable Standards

The design and construction of all irrigation facilities for the Project shall be in accordance with the latest edition of the CDOT Standard Specifications for Road and Bridge Construction and the CDOT Standard Plans.

The Contractor shall meet the requirements included in the executed CDOT/Irrigation Owner agreement for the siphon at Station 446+80. If the Contractor chooses to change the design from what was previously approved they shall obtain the written approval of both CDOT and the Irrigation Owner.

In performing the Ditch Work, the Contractor shall ensure that all Irrigation Work results in the ditch and or structures being located in a manner to allow future maintenance to be performed by the relevant Irrigation Owner without disruption to the operation or maintenance of SH 92.

Administrative Requirements

Within 10 Days after NTP for design, the Contractor shall notify all the Irrigation Owner representatives. The Irrigation Owner representatives contact information is included in the Utility contact information in Section 7 – Utilities.

The Contractor shall meet with each Irrigation Owner representative and CDOT as soon as practicable after NTP for design to review all owner points of concern and other items which may affect the schedule. The Contractor shall identify critical Activities and sequences, as they affect irrigation operations, and plan to effectively mitigate irrigation impacts.

Unless previously approved, the Contractor shall obtain Irrigation Owner acceptance in writing, in advance, on methods and procedures covering all Work on the Irrigation Owners property. Upon completion of the Work, the Contractor shall remove from the premises of the Irrigation Owners ROW all equipment, surplus material, and debris, leaving such premises in a neat condition satisfactory to the Irrigation Owner. The Contractor shall provide As-Built drawings to the Irrigation Owner and obtain their acceptance in writing for all Work on the owner's property.

Section 6 - Third Party Agreements

Utility Crossings

The Utility Owner is not responsible for Utilities on the Utility Owners ROW. The Contractor shall locate all Utilities on the Utility Owners ROW within the immediate vicinity of the Work. The Contractor shall certify to CDOT that all Utilities on the Utility Owners ROW and within the immediate vicinity of the Work have been identified and properly located.

Design Reviews

Unless previously approved, the Irrigation Owners will review design plans for Work on the Irrigation Owners' property. Irrigation Owners' review is separate from CDOT oversight. The Contractor shall coordinate the required Irrigation Owners' design reviews with the Irrigation Owners. All plans submitted to the Irrigation Owners for review and approval shall be in English units.

The Contractor shall obtain Irrigation Owners approval, in writing, of design plans for all of the design elements of the Work on the Irrigation Owners' property.

Construction Requirements

The Contractor shall coordinate with the Irrigation Owners prior to beginning any construction on or adjacent to the Irrigation Owners' ROW. Working windows for demolition and construction shall be coordinated with the Irrigation Owners.

Unless previously approved, the Contractor shall obtain Irrigation Owners' agreements in writing, in advance, on methods and procedures covering all Work on the Irrigation Owners' property. Copies of such approvals, notices, and correspondence shall also be submitted to CDOT.

The Contractor shall cooperate with the Irrigation Owners where Work is within the limits of the Irrigation Owners' property to expedite the Work and to avoid interference with the operation of ditch flow.

The Contractor shall perform the Work in such manner and at such times as shall not to endanger or interfere with the continuous operation of the ditch and property of the Irrigation Owners and the flow of water at or in the vicinity of the Work. No Work shall be allowed that interferes with the deeded schedule and volume of flow of the ditch. The Contractor shall be responsible to the Irrigation Owners for all damages for delays that may be sustained by the Irrigation Owners caused by any interference that could have been avoided by proper handling of the Work.

The Contractor shall not pile or store any materials or tools, or park any equipment, when not in use, on Irrigation Owners' property. Upon completion of the Work, the Contractor shall remove from the premises of the Irrigation Owners ROW all equipment, surplus material, and debris, leaving such premises in a neat condition satisfactory to the Irrigation Owners.

Section 6 - Third Party Agreements

The Contractor shall obtain Irrigation Owners' approval, in writing, of construction for all of the elements of the Work on the Irrigation Owners' property. Copies of such approvals, notices, and correspondence shall also be submitted to CDOT.

Deliverables

At a minimum, the Contractor shall submit the following for review, approval, and/or acceptance:

Section 6 - Third Party Agreements

Deliverable	Review, Acceptance, or Approval	Schedule
Notify Railroad of Project commencement	Railroad	Within 10 Days of NTP for design
Contractor's Right of Entry Agreement	Executed by the Railroad	Prior to commencing Work on Railroad property
Written notice of intent to commence Work on Railroad ROW	Railroad	30 days prior to beginning work. Per the executed agreement with the Railroad
Provide a monthly detailed schedule of Work to the Railroad Representative	Railroad	Monthly
Written notice that all work within Railroad property has been completed	Railroad	Within10 days following completion and acceptance of the Work
Railroad design plans	Submitted through CDOT - Approval by the Railroad	Per the BNSF Railway – Union Pacific Railroad Guidelines for Railroad Grade Separation Projects
PUC documentation and/or exhibits	CDOT	As requested by CDOT
Notify Irrigation Owner of Project Commencement	Irrigation Owners	Within 10 Days of NTP for design
Irrigation Owners design plans (if not already approved)	Review and approval by Irrigation Owner	Prior to beginning any construction on Irrigation Owners property
Final written acceptance of Irrigation Work	Review and approval by Irrigation Owner	After construction is complete on Irrigation Owners property

Section 7 – Utilities

General Utility Work Obligations

The work described in these plans and specifications requires full cooperation between the Contractor and the utility owners in accordance with subsection 105.11 in conducting their respective operations so the utility work can be completed with minimum delay to all parties concerned.

The Contractor shall be required to meet with each utility owner impacted by the work a minimum of thirty (30) days in advance of any construction operations to coordinate required utility work with the construction activity. Coordination with utility owners includes, but is not limited to, providing and periodically updating an accurate construction schedule that includes all utility work elements. Surveying and/or staking of utility relocations to be performed by the owner shall be the responsibility of the owner.

The Contractor shall conduct coordination meetings a minimum of weekly for the purpose of coordinating construction activities with the utility owners. Frequency of the utility coordination meetings may be revised with the prior written consent of the Engineer.

The Contractor shall provide traffic control for any utility work expected to be coordinated with construction operations as directed by the Engineer. However, traffic control for utility work outside of typical project work hours or outside of project limits shall be the responsibility of the utility owner.

The Contractor shall keep each utility owner advised of any work being done to its facility so that each utility owner 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, and shall allow the expected number of working days for utilities to complete necessary work. The number of day's prior notice is noted for each utility owner.

The Contractor shall not make any design changes that require the relocation of any utility that has already completed the relocation of their facilities.

Known Utilities

Rogers Mesa Domestic Water	Cassandra Shenk	970-208-7716
Delta-Montrose Electric Association	DeWayne Eiler	970-240-1296
SourceGas – High Pressure	Todd Schweizer	970-874-4432 ext. 226
TDS Telecommunications	James Lyman	970-872-6056
Irrigation Ditch (Siphon)	Velma Holder	970-835-3962
Union Pacific Railroad	Sherman Spear	303-405-5039

Section 7 – Utilities

Unknown Utilities

Unknown utilities not shown on the plans and discovered during construction that require relocation will be paid for by Change Order per section 109.04 of the Standard Specifications.

Abandoned Utilities

All abandoned utility materials within the project limits will become property of the Contractor. The Contractor shall verify with the utility owner that the utility material is abandoned before removal. The Contractor shall be responsible for removal and disposal of the materials. The cost for removal and disposal of the abandoned utility materials shall not be paid for separately but shall be included in the work.

Utility Coordination

ROGERS MESA DOMESTIC WATER

Contractor Responsibilities –

An existing water line located within SH 92 between Station 429+00 to 447+00 shall be replaced by the Contractor. All associated installation and testing procedures shall be per the plans and project specifications (Water line). The Rogers Mesa Water District approved Plans are included in the Reference Documents (See Utility Plans). The Contractor is responsible for coordinating with the Rogers Mesa Domestic Water for inspection during construction and shall provide As-Built drawings to both CDOT and Rogers Mesa Domestic Water at the completion of the project.

Prior Notice – 30 days

Utility Company Responsibilities –

Rogers Mesa Domestic Water will need to be present for testing as Contractor completes installation of new water line.

Rogers Mesa Domestic Water will assist with providing locates of the existing water line.

DELTA-MONTROSE ELECTRIC ASSOCIATION

Contractor Responsibilities –

The Contractor shall schedule their work activities around the Delta-Montrose Electric operations.

Prior Notice – 30 days

Utility Company Responsibilities –

Delta-Montrose Electric will relocate and/or adjust their facilities at the following locations:

Section 7 – Utilities

Station 443+50	Relocate or temporarily support anchor on existing overhead pole
Station 432+80 - 434+00	Install 10' taller poles on the existing alignment to accommodate roadway profile change.
Station 406+50	Remove overhead power source and provide a temporary underground power source for UPRR crossing equipment

See Reference Documents (Utility Sheets) for approximate locations.

SOURCEGAS – High Pressure/Low Pressure

Contractor Responsibilities –

Contractor shall coordinate with SourceGas during the relocation of their facilities at the locations indicated below. SourceGas anticipates mobilizing onto the project the first part of October 2013 and expects to be completed by the end of March 2014 with the exception of work between Stations 428+00-432+00. This area will be completed near the end of construction after the new slopes have been constructed and will need to be coordinated with the Contractor's operations.

The Contractor shall schedule their work activities around the SourceGas operations.

Prior Notice – 30 days

Utility Company Responsibilities –

SourceGas will relocate and/or adjust their facilities at the following locations:

Station 370+80	North side tie-in with a bore to the South side of existing SH 92
Station 370+80 – 404+00	HP Gas will be located on south side of existing SH 92
Station 404+00 – 405+00	New HP gas line to be bored under the existing at grade railroad crossing
Station 405+00 - 409+00	Continued bore location.
Station 409+00 - 420+50	HP New regulation station at 420+50 pick-up LP gas
Station 420+50 - 428+00	HP and LP gas lines will run along northerly ROW line
Station 428+00 – 432+00	HP/LP gas will be relocated to under drive access and install a temporary system along the northerly edge of existing SH 92. Once work at the Big Gulch box culvert extensions is at 90% a permanent location will be installed
Station 432+00 - 448+00	HP and LP gas lines will continue along northerly ROW until tie-in point at Station 448+00.

Section 7 – Utilities

See Reference Documents (Utility Sheets) for approximate locations. The Contractor shall not submit a design that conflicts with previous gas relocations.

TDS TELECOMMUNICATIONS

Contractor Responsibilities –

Contractor shall be responsible for protecting the existing TDS Telecommunications facilities from damage due to their construction operations. TDS will relocate both their copper and fiber optic facilities as indicated below. This work will need to be coordinated with the Contractor's operations.

Prior Notice – 30 days

Utility Company Responsibilities –

TDS Telecommunications will provide locates and verify the depth of the fiber optic line and telephone lines if required. TDS Telecommunications will relocate and/or adjust their facilities at the following locations:

Station 397+22 Rt	Lower in place if necessary to accommodate the installation of the cross culvert
Station 427+10 – 427+70	Install new 45 foot poles to raise overhead crossing of telephone line.
Station 421+40 – 427+70 Lt	Install new copper line near the north ROW line
Station 438+25 – 450+00 Lt	Remove existing overhead line
Station 440+00 – 447+00 Rt	Bore new fiber optic and copper lines deep under the proposed retaining wall
Station 447+00 – 450+00 Rt	Relocate fiber optic and copper lines to near the south ROW line

See Reference Documents (Utility Sheets) for approximate locations.

IRRIGATION DITCHES

Contractor Responsibilities –

See Section 6 for Irrigation Ditch requirements

UNION PACIFIC RAILROAD

Contractor Responsibilities –

See Section 6 for Railroad requirements

Section 7 – Utilities

UNCC Requirements

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 NOTICE OR THE DAY OF EXCAVATION) prior to commencing such operations. Contact the Utility Notification Center of Colorado (UNCC) at 811 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. For CDOT owned utility facilities the Contractor shall call the Region 3 Traffic Section at 970-683-6271 to request locates. CDOT is not contacted when locates are requested through the UNCC. Utility service laterals shall also be located prior to beginning ANY excavation or grading.

The locations of utility facilities as shown on the Reference documents, and/or herein described, were obtained from the best available information.

Section 7 – Utilities

Project Special Provisions

REVISION OF SECTION 619
WATERLINE

DESCRIPTION

This work consists of furnishing and placement of approved materials for waterline and associated activities.

MATERIALS

All materials shall be new, unused, and of the best standard quality available for the purpose intended. At least 15 days before beginning the work, the Contractor shall submit information on the procedures, equipment and materials to be used. The methods, equipment and materials used to complete this item shall be approved by the Engineer prior to beginning the work.

PVC Water Distribution Pipe. PVC pipe shall be Class 200 (SDR 21) and shall conform to ASTM-2241 Pressure Pipe.

Fittings. Fittings for use with PVC pipe shall be ductile iron or cast iron conforming to AWWA C110 or C153. Curb stops shall be used for all water service line 2" in diameter or smaller.

Sealants. Acceptable sealants are Harvey's Tee Paste as manufactured by William H. Harvey Company of Omaha Nebraska 68117 (402-331-1175) or Spear's Blue-75 Thread Sealant as manufactured by Spear's Manufacturing Company of Sylmar CA 91392 (818-364-1611). Rectorseal-5 is NOT acceptable.

Bolts. All bolts for mechanical joints shall be Cor-Blue® bolts or approved equal. All bolts for flange connections shall be stainless steel bolts with the threads coated with anti-seize.

Joints. Joints shall be bell and spigot type sealed with elastomeric gaskets conforming to ASTM D-3139. Couplings shall be able to withstand the same internal pressure and external loading as the pipe.

Ductile iron fittings for use on PVC pipe shall conform to AWWA C-104 and C-153 Restrained pipe fitting connections shall be restrained with a Megalug®, JCM®, Uniflange Series 1500® or other approved joint restraint.

Section 7 – Utilities

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REVISIOIN TO SECTION 619
WATERLINE

Gate Valves. Gate valves shall be resilient seat or resilient wedge type gate valves conforming to AWWA C-509. Valves shall have cast iron or ductile iron bodies and bronze mounted non-rising stems with o-ring seals. The stem and all wearing surfaces shall be bronze or other approved non-corrosive material. Valves shall turn left to open. The interior of all gate valves shall be coated with fusion bonded epoxy coating conforming to the requirements of ANSI/AWWA C550.

Valve Boxes. A cast iron valve box and lid shall be provided where shown on the plans.

Valve boxes shall be 5 ¼ inch diameter, slip type, sized for the type of valve and depth of bury. The lid shall have the word "WATER" permanently cast on the top.

Valves. All Valves shall be restrained to fittings by approved method.

Insulation. Insulation shall be required where pipe or joints are above a minimum 48" bury depth. Insulation material shall be high density polystyrene or polyurethane foam, 2" thickness, shaped for 2" pipe and joint connections.

Flushing Hydrant. Flushing Hydrant shall be Model TF200 Post Hydrant as manufactured by John C. Kupferle Foundry Company or approved equal.

Air/Vacuum Valve. Air/Vacuum Valve shall be A.R.I. Model D-040 or approved equal.

CONSTRUCTION REQUIREMENTS

Pipe Laying of Pressure Pipelines. Pipe shall be laid on the alignment shown on the plans. Unless otherwise specified or approved, all pressure pipelines shall be laid to a minimum bury depth of forty-eight (48) inches measured from the proposed final ground surface to the top of the pipe. The inside of the pipe and jointing surfaces shall be kept clean and free from mud, dirt, gravel, ground water, and other foreign material. When pipe laying is not in progress, the open ends of the pipeline shall be kept closed with watertight plugs. During the pipe assembly process, chlorination tablets for disinfection shall be affixed to the inside top of pipe as assembled, using a water soluble permatex sealant material.

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REVISION TO SECTION 619
WATERLINE

Electrical Continuity. Water pipe shall be buried with a continuous electrical tracing wire to enable future location of the pipe. Tracing wire shall be taped to the top of the pipe at ten (10) foot intervals to prevent dislocation of the wire during backfilling.

Polyethylene Encasement. Prior to backfilling, all metal pipe fittings, valves and appurtenances shall be wrapped with polyethylene encasement material. Polyethylene film shall have a minimum thickness of 0.008 (8¬mil) inches. Installation of the polyethylene encasement shall be in accordance with AWWA C-105 Method "A." Ductile iron valves and fittings shall be fully encapsulated by the polyethylene encasement, except the valve-operating nut. The ends of the polyethylene shall be taped around the full circumference of the pipe. If the polyethylene is cut or more than one piece is used to wrap the valve or fitting, the pieces shall overlap a minimum of twelve (12) inches and the full length of the seam shall be taped.

Thrust Restraint. Thrust restraint shall be provided at all pipe bends, tees, caps, valves, hydrants, and at the end of all stub outs or dead end lines. Thrust restraint may be provided by concrete blocking or mechanical restraints. Any in-line valve that is at least twenty (20) feet from the nearest fitting need not be separately restrained.

Concrete Thrust Blocking. The size and location of concrete blocking shall be in accordance with the Waterline Details as shown on the plans. Thrust blocks shall be poured on firm, stable foundation material and all bearing surfaces shall be against undisturbed earth.

Concrete for thrust blocks shall be made with modified Type II Portland cement and shall reach a minimum compressive strength of three thousand (3000) psi in twenty-eight (28) days. All anchorage steel not embedded in concrete shall be factory epoxy coated or Cor-Ten steel.

Flushing hydrants shall be dry blocked as well as mechanically restrained, as shown on the Waterline Details.

Mechanical Restraint. Valves and fittings shall be restrained by mechanically connecting them to the pipe or other fittings. Fitting to fitting connections may be made with a flange-by-flange connection or an integral ring anchoring fitting by mechanical joint connection. Pipe by fitting connections may be restrained with a Megalug®,

Section 7 – Utilities

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REVISION TO SECTION 619
WATERLINE

JCM®, Uniflange Series 1500® or other approved joint restraint. Where a short piece of pipe is installed between a fitting and a valve or other fitting, the restraint may be provided by connecting the mechanical joints with five-eight (⅝) inch stainless steel rod. The rod shall be connected to the mechanical joint fitting using tie-back bolts, not through the fitting's bolt holes. The rod shall be coated with an asphaltic sealant. All mechanical restraints shall be encased with polyethylene.

Pipeline Testing

General. The pipeline shall be tested before final acceptance. The Contractor, under direct control and observation of a representative of the Rogers Mesa Water District, shall witness all testing. The Contractor shall furnish all labor, equipment, tools, water and other incidental items required to conduct the tests. If the
pipeline fails to meet the test requirements, the leak or other deficiency shall be located and repaired. After the repairs or corrections have been made, the pipeline shall be retested. Repairs and retesting shall continue until the test requirements have been met. All costs associated with repairs and retesting shall be the Contractor's responsibility and will not be reimbursed by CDOT.

Testing Pressure Pipelines. Water pipe shall be tested for pressure and leakage in accordance with these specifications and AWWA C-605, Section 7. Pavement or other permanent surfaces shall not be placed until all pressure and leakage tests are satisfactorily completed. If the section of pipe being tested includes components of an existing system or components installed by others, the testing shall be done at the Contractor's risk.

Test Pressure. The test pressure shall be 200 psi.

Filling. The pipeline shall be filled with potable water at least twenty-four (24) hours before being subjected to the hydrostatic pressure test. Each section of pipeline shall be filled slowly and all air expelled by means of taps at points of highest elevation. If temporary taps are installed to fill the line or release the air, the corporation stop shall be removed and the tap plugged when the disinfection and testing have been completed.

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REVISION TO SECTION 619
WATERLINE

Pressure Test Procedure. Pressure and leakage tests may be performed simultaneously or separately. The total time for the combined pressure and leakage tests shall be a minimum of two (2) hours for each section of pipeline. If separate tests
are made, the pressure test shall be made first. The duration of the pressure test shall be a minimum of one (1) hour and the duration of the leakage test shall be a minimum of four (4) hours. The pressure of the leakage test may be reduced to one hundred and fifty percent (150%) of the maximum operating pressure that will occur on that portion of the line.

Leakage is defined as the quantity of water to be supplied to the section of pipeline being tested that is necessary to maintain the specified leakage test pressure after the pipe has been filled with water and the air expelled.

The specified test pressure shall be applied by means of a pump connected to the pipe in a manner satisfactory to the Engineer. No pipe installation will be accepted if the leakage for the section of the line being tested is more than the rate calculated using the following formula:

$$L=(N \times D \times \sqrt{P}) / 7400$$

Where: L = Allowable leakage in gallons per hour, N = Number of joints in length pipeline tested, D = Nominal diameter of pipe in inches, P = Average test pressure in psi gauge.

The allowable leakage rates for typical pipe sizes and pressures, based on twenty (20) foot joint lengths, within the water distribution system are as follows:

Allowable Leakage (gal/hr) for 1,000 FT of Pipe							
Nominal Pipe Size (in)	Average Test Pressure (psi)						
	50	75	100	125	150	200	250
2	0.1	0.12	0.14	0.15	0.17	0.19	0.2

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REVISION TO SECTION 619
WATERLINE

Tracing Wire Continuity Test. Each valve box shall be visually inspected to verify that the tracing wire has been properly placed. The Contractor, in the presence of the inspectors, CDOT Engineer and representative from Roger's Mesa Domestic Water, shall test the continuity of the tracing wire in each direction from each valve box or hydrant. An electronic pipe locator shall be connected to the tracing wire and a strong signal shall be received along the pipeline to the next valve box. This test shall be performed prior to paving, for example, during pressure testing and/or backfill work.

Disinfection of Water Lines

Disinfection Standard. All water mains shall be disinfected in accordance with AWWA Standard C651-99. Method of chlorination shall be by tablet in accordance with supplier's dosage requirements to meet the AWWA disinfection standard. Disinfection shall be coordinated with the Rogers Mesa Water District. After disinfection time, the Contractor shall coordinate flushing with the District. Sampling of disinfection and Bacterial testing (BacT) after flushing shall be the responsibility of the Contractor.

Section 8 – Right-of-Way

Administrative Requirements

CDOT will retain possession of each parcel and all improvements, if any, made thereon by the Contractor. The Contractor's access and use of the Right-of-Way (ROW) arises solely from the permission granted by CDOT under the Contract.

Acquisition and Relocation Standards

All ROW acquisition and relocations shall be performed in accordance with all applicable federal and state laws, including:

1. The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended.
2. Design/Build Projects, 23 CFR 710.313(d).
3. The Colorado Relocation Assistance and Land Acquisition Policy, CRS 24-56-101, et seq., as supplemented.
4. CDOT's Right-of-Way Manual dated January 2011. CDOT's authority to acquire property is contained in Sections 43-1-208, 210 and 43-3-106 CRS (1984).

Status of Right-of-Way

As shown on the Right of Way Plans dated 10/11/2012, and included in the Contract Documents, CDOT has obtained the right-of-way shown on the Right of Way Plans for Parcel Numbers 100, TE-100, TE-100A, TE-102, TE-102A, 104, 105, TE-105, 107, TE-107, TE-108, 109, PE-109, TE-109, and 110. Memorandums of Agreement, as executed between the CDOT and the affected landowners, are included in the Contract Documents. Work for the Project is to be constructed within the legally described limits of the parcels listed in this paragraph and Contractor shall adhere to the terms of the Memorandums of Agreement.

The following parcels, as shown on the Right of Way Plans, are considered restricted and no Work can be performed within the described limits of these parcels until the CDOT gains possession through an agreement or other action: TE-103, 106, and TE-106. Parcel TE-103 has an anticipated restriction date until March 1, 2014, and Parcels 106 and TE-106 have a restriction date until June 1, 2014. The CDOT Project Engineer shall provide Contractor with authorization to proceed with construction activities in the restricted no Work zones when CDOT has legal possession to complete the Work.

All work shall be completed within the existing and proposed CDOT ROW and Easements as shown in the Contract Documents. The Contractor shall not trespass on private property. In the event trespass occurs, the Contractor shall be liable for all mitigation costs and damages as provided by law.

Permission to Enter Property

The Contractor shall secure Permission to Enter Property Forms prior to entering any property outside the ROW for surveying, environmental or any other purposes. It shall be the

Section 8 – Right-of-Way

Contractor's sole responsibility to obtain the forms and the Contractor shall be responsible for any and all damages and claims. The Contractor shall submit copies of all Permission to Enter Property Forms to the CDOT Project Engineer for acceptance.

Construction Requirements

Restoration of Property and Landscape

Should the Contractor damage, injure or destroy property or landscaping for which the owner has not been compensated, the Contractor shall, at its sole cost and expense, repair and/or replace or restore the damage to a condition similar or equal to that existing prior to the damage. Restoration may include, but is not limited to, repair, replacing in kind, rebuilding, or replanting.

Protection of Property

Once easements have been acquired for a property in accordance with the requirements herein, the Contractor shall manage and minimize losses to the property in accordance with the Technical Requirement Section 18 - Maintenance during Construction. This shall include the installation of temporary security fencing sufficient to contain animals, people, and to delineate leach fields. The temporary fencing shall be installed prior to removing any ROW fencing in place within the Project limits.

RIGHT OF WAY

Right-of-Way plans will be available for review on the website at http://www.coloradodot.info/projects/sh92stengelshill until the date set for opening bids.

The Department anticipates no delay toward completion of the project due to the restrictions imposed herein.

Section 9 – Survey

Administrative Requirements

Standards

The Contractor shall comply with the requirements of the Contract Documents and shall meet all applicable federal, state, and local requirements related to surveys, records, and monuments.

Project Survey Coordinator

The Contractor shall designate a Colorado Registered Professional Land Surveyor as the Project Survey Coordinator. The Project survey coordinator shall be in responsible charge of all Contractor survey Activities on the Project. The Project Survey Coordinator shall direct and review all survey Work and shall be the point of contact for all survey related Activities. Contractor survey staff shall perform Work under the direct supervision of the Project Survey Coordinator.

CDOT Supplied Survey Data

The full extent of survey and mapping information to be supplied by the Colorado Department of Transportation (CDOT) is available and is for the Contractor's use. The Contractor shall verify and confirm the accuracy of all survey and mapping information provided to the Contractor, regardless of the source of the information. The Contractor shall document all forms of data verification.

Any discrepancies in information provided shall be reported to the CDOT Project Engineer.

The Contractor acknowledges and agrees that changes in conditions at the Site may occur after the Proposal Due Date, and that the Contractor shall not be entitled to any Change Order.

The survey and mapping information including DGN and DTM data is included in the Reference Documents.

Contractor Supplied Survey Data

Except as provided by CDOT above; the Contractor shall provide all other survey required for completion of the work.

Preservation of Survey Monuments

The preservation of survey markers and monuments is mandatory and affects all governmental agencies. The Contractor shall notify the agency affected as soon as it becomes known that a marker is in a position that will interfere with new construction or with Contractor operations. The marker position shall be accurately preserved prior to disturbing any such marker.

Section 9 – Survey

CDOT Monuments

If any survey monuments are at risk of being destroyed at any time within the Right-of-Way (ROW), the Contractor shall immediately notify the CDOT Project Engineer. The Contractor shall coordinate with the affected agency for a replacement marker disk, which has been properly stamped together with instructions for establishment of the new marker. The Contractor shall have the new marker set in accordance with the provided instructions and the requirements of the Contract. The new marker shall be set under the direct supervision, and responsible charge of the Project Survey Coordinator or other Colorado Registered Professional Land Surveyor, and where required by Colorado statute shall bear the registration number of the responsible Professional Land Surveyor.

Other Agency Monuments

The Contractor shall coordinate with all other agencies with monuments on the Project to protect and restore their monuments as required to complete the Work.

Survey Records

The Contractor shall prepare and maintain supporting documentation, including but not limited to field notes, drawings, and calculations for all survey Work on the Project.

All survey records shall conform to the formats shown in the CDOT Survey Manual. Such records shall be neat, legible, accurate, and maintained by the Contractor in a neat and orderly manner.

The Contractor's Project Survey Coordinator shall be required to sign and seal all survey documentation in accordance with state law. All such documentation shall be transmitted to the CDOT Project Engineer at the completion of the Work.

Design Requirements

Design Control Surveys

The Contractor shall plan, schedule, and perform all surveys and monumentation necessary to maintain and supplement the Project control network for the design of the Project.

The Contractor shall submit to the CDOT Project Engineer a revised Project control diagram showing all modifications to the Project control network.

Design Surveys

The Contractor shall arrange for all supplemental survey information and utility locations necessary to complete the design. Design surveys shall provide sufficient detail to verify actual field locations of existing drainage improvements as well as for the final design of drainage improvements. Surveying shall be performed in accordance with the CDOT Survey Manual. Traffic control and permits necessary to complete the survey shall be the responsibility of the Contractor. The Contractor shall deliver the data (in InRoads TMOSS

Section 9 – Survey

survey format) and field notes to the CDOT Project Engineer for review upon completion of the survey. Errors and omissions found by the CDOT Project Engineer shall be corrected by the Contractor and resubmitted.

Construction Control Surveys

The Contractor shall plan, schedule, and perform all surveys and monumentation necessary to maintain and supplement the Project control network for the construction layout of the Work.

Construction Layout Surveys

The Contractor shall plan, schedule and perform all staking and construction layout required for the Work in accordance with the conventional staking requirements as described in the CDOT Survey Manual.

As-Built Surveys

The Contractor shall plan, schedule and perform all surveys required to document the location of as-built features on the Project.

ROW Monumentation

The Contractor shall replace all ROW monumentation lost or destroyed during the progression of the Work.

The Contractor shall submit to the CDOT Project Engineer for acceptance a revised ROW monumentation sheet listing all ROW monumentation reset by the Contractor.

Deliverable	Acceptance or Approval	Schedule
Survey Files	Acceptance	Within 30 days of Work completion

Section 9 – Survey

Project Special Provisions

REVISION OF SECTION 629
SURVEY MONUMENTATION

Section 629 of the Standard Specifications is hereby revised for this project as follows:

In subsection 629.09 delete the fourth paragraph and replace with the following:

Before final payment is made, the following three items shall be completed, bear the seal and signature of the PLS in responsible charge, and have copies submitted to the Engineer for review prior to being deposited with the county in accordance with Section 38-51-107, CRS:

(1) All survey records.
(2) The Control and Monumentation sheet of the R/W plans.
(3) The Survey Control Diagram.

Section 10 – Geotechnical and Roadway Pavements

Geotechnical Investigations

Geotechnical investigations are provided and available in the Reference Documents. See project website at http://www.coloradodot.info/projects/sh92stengelshill.

The Contractor has, prior to submitting its Proposal, in accordance with prudent and generally accepted engineering and construction practices, reviewed the boring logs provided in the Reference Documents, inspected and examined the Site and surrounding locations, and undertaken other appropriate activities sufficient to familiarize itself with surface conditions and subsurface conditions affecting the Project, to the extent the Contractor deemed necessary or advisable for submittal of a Proposal. As a result of such review, inspection, examination and other activities, the Contractor is familiar with and accepts the physical requirements of the Work. The Contractor acknowledges and agrees that changes in conditions at the Site may occur after the Proposal Due Date, and that the Contractor shall not be entitled to any Change Order. Before commencing any Work on a particular aspect of the Project, the Contractor shall verify all governing dimensions and conditions at the Site and shall examine all adjoining work, which may have an impact on such Work. The Contractor shall be responsible for ensuring that the Design Documents and Construction Documents accurately depict all governing and adjoining dimensions and conditions.

The Contractor shall be responsible for any supplemental subsurface investigation necessary to complete the Work. Geotechnical investigations shall comply with the requirements of the CDOT Field Materials Manual and the CDOT Pavement Design Manual in effect at the time of bidding. All supplemental investigations made by the Contractor shall be documented in a geotechnical investigation report and submitted to the CDOT Project Engineer and CDOT Geotechnical Program for Acceptance.

Roadway Embankment Requirements

The onsite material available for embankment is an AASHTO classified A-6, A-7-6 material that is not suitable for high fill areas under the Roadway Prism. The Roadway Prism is the area defined by a 1:1 slope from the edge of pavement. High fill areas are considered where the roadway embankment exceeds 12 feet in height. CDOT is concerned with settlement issues if the Contractor chooses to use onsite embankment material in high fill areas. CDOT has performed swelling and consolidation test on the onsite material (See Geotechnical Memorandum – September 14, 2012 in the Reference Documents). These test show that the onsite material has the aptitude to consolidate up to 10 inches based on a 45 foot fill. The Contractor shall address these settlement issues in the proposed design through the use of select fill material or design alterations.

Onsite material may be used for slope flattening outside the Roadway Prism, in areas under 12 feet of fill or if demonstrated by the Contractor that the proposed design addresses settlement. CDOT has stockpiled an estimated 45,000 cubic yards of embankment material from prior projects. This material is available for Contractor use at suitable locations and is located within the project limits at MP 14.0 adjacent to SH 92 and Shamrock Road. The material has been

Section 10 – Geotechnical and Roadway Pavements

tested and is an AASHTO classification A-6, A-7-6. If this material is used the Contractor shall reshape and apply final stabilization to the disturbed areas. This Work shall be included in the Project Cost.

Roadway Pavement Analysis and Design

CDOT has performed the pavement design to determine the pavement type, HMA grading, design gyrations, binder requirements, pavement thickness, and minimum sub-grade stabilization requirements. The Contractor shall be responsible for all other aspects of pavement design.

Pavement Structure

The Pavement Structure is defined as the thickness of the Hot Mix Asphalt (HMA) plus the Aggregate Base Course (ABC). See Reference Documents for Pavement Structure recommendation letter.

Construction Requirements

The Contractor shall construct the Pavement Structure in accordance with the Technical Requirements.

Prior to applying HMA, sweeping of dirt and gravel from the existing mat is required.

Any layer of HMA that is to have a succeeding layer placed thereon shall be completed to full width before the succeeding layer is placed.

Roadway Pavement Types

Hot Mix Asphalt (HMA) pavement will be required on SH 92.

Smoothness Requirements

Smoothness requirements shall be HRI Category II according to Section 105.07 of the Standard Specifications.

New Hot Mix Asphalt Construction

Full depth pavement reconstruction is required for SH 92 where proposed alignment does not fall on existing alignment.

In areas where the proposed alignment falls on the existing pavement the Contractor may rubblize existing pavement structure and use in place of Class 3. This material shall be compacted to a minimum of 95% of the maximum wet density determined in accordance with AASHTO T-180 Method D. The soils moisture-density curve will be developed using wet densities and the percent compaction will be calculated using wet density.

Section 10 – Geotechnical and Roadway Pavements

The Contractor shall use HMA (Grading SX) (75)(PG 64-28) and HMA (Grading SX) (75)(PG 58-28) for the roadway HMA pavement. The Contractor shall use HMA (Grading SX) (75) (PG 64-28) on the bridge surface. Pavement shall comply with the specifications in this Section.

The Contractor shall use the following lift thicknesses when placing HMA pavement.

1. Roadway Top layer: 2-inches of HMA (Grading SX) (75)(PG 64-28)
2. Roadway Bottom Layer: 3-inches of HMA (Grading SX) (75)(PG 58-28)
3. Bridge: 3-inches of HMA (Grading SX) (75) (PG 64-28)

The Contractor shall use HMA (Grading SX)(75)(PG 64-28) for any leveling and patching required.

Pavement Thickness

The Contractor shall construct the Pavement Section to the thickness requirements shown on the plans for the Project, as set forth in the Table below:

Location	Required Pavement Section Thickness (inches)			Pavement Smoothness Category (i)
	HMA	ABC Class 6	ABC Class 3	
SH 92 (Full depth)	5	6	14	HRI Category II
SH 92 (Rubblized Sections)	5	6	Rubblized Pavement	HRI Category II
Approaches (Paved Areas)	5	6	NA	NA
Approaches (Non Paved)	NA	6	NA	NA
Bridge	3	NA	NA	NA

Section 10 – Geotechnical and Roadway Pavements

Deliverables

Deliverable	Acceptance or Approval	Schedule
Technical Memorandum that indicates the Contractor has reviewed and accepts the provided Geotechnical Reports and that the Contractor has no exceptions and/or the Contractor provides the following changes. Technical Memorandum must be stamped by the Contractor's Design Professional Engineer	Acceptance	Prior to Design
Supplemental Geotechnical Investigations	Acceptance	N/A

Section 10 – Geotechnical and Roadway Pavements

Project Special Provisions

REVISION OF SECTION 106
CONFORMITY TO THE CONTRACT OF HOT MIX ASPHALT

Section 106 of the Standard Special Provisions is hereby revised for this project as follows:

Subsection 106.05 shall include the following:

For this project, Contractor process control testing of hot mix asphalt is mandatory.

Section 10 – Geotechnical and Roadway Pavements

REVISION OF SECTION 304
AGGREGATE BASE COURSE

Section 304 of the Standard Specifications is hereby revised for this project as follows:

Subsection 304.02 shall include the following:

Materials for the subbase shall be Aggregate Base Course (Class 3) as shown in subsection 703.03. With the exception that the maximum particle size shall be 6 inches.

Materials for the base course shall be Aggregate Base Course (Class 6) as shown in subsection 703.03.

The aggregate base course (Class 3) and (Class 6) shall meet the gradation requirements and have a resistance value of at least 70 and 78 respectively when tested by the Hveem Stabilometer method.

Section 10 – Geotechnical and Roadway Pavements

REVISION OF SECTION 401
PLANT MIX PAVEMENT COMPACTION
(PNEUMATIC TIRE ROLLERS)

Section 401 of the Standard Specifications is hereby revised for this project as follows:

In subsection 401.17, first paragraph, delete the second sentence and replace with the following:

Both steel wheel and pneumatic tire rollers will be required on this project. If the Contractor has demonstrated that all of the manufacturer's recommendations were followed and the pneumatic tire roller is detrimental to the finished surface of the HMA, the Engineer, in cooperation with the Contractor and the Region Materials Engineer, may waive the pneumatic tire roller requirement.

Section 10 – Geotechnical and Roadway Pavements

REVISION OF SECTION 304 & 403
WEIGHT TICKET COLLECTION

Section 304 and 403 of the Standard Specifications is hereby revised for this project as follows:

Subsection 304.08 and 403.05 shall include the following:

The Contractor shall collect the original 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 Contractor's representative assigned this project function shall not be responsible for any other duties. The scale tickets shall be available on site for CDOT personnel to inspect.

At the close of each workday, the Contractor shall provide the Engineer envelopes, which contain that 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 shall 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.

5. Asphalt Paving Inspector Daily Report (CDOT Form 282) shall be completed, in its entirety, by the contractor as work progresses.

Section 10 – Geotechnical and Roadway Pavements

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REVISION OF SECTION 304 & 403
WEIGHT TICKET COLLECTION

Each day, the Contractor shall provide a vehicle identification sheet that contains the following information for each vehicle:

(1) Vehicle number
(2) Length
(3) Tare weight (Tractor and Trailer Combination – Tare Separately)
(4) Number of axles
(5) Distance between extreme axles
(6) All other information required to determine legal weight
(7) Legal weight limit

Should the Contractor fail to weigh each vehicle daily, the Engineer may reject HMA loads until the Contractor complies with these requirements. All costs incidental to the foregoing requirements shall be included in the original contract prices for the project.

Section 10 – Geotechnical and Roadway Pavements

REVISION OF SECTION 401 AND 403
HOT MIX ASPHALT (GRADING SX)(75)

Section 401 of the Standard Specifications is hereby revised for this project as follows:

In Subsection 401.22 under Basis Of Payment, delete the fifth paragraph.

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

	TEST METHOD	VALUE FOR PROPERTY
Grading		(SX75)
Air Voids, percent at N(des)	CPL 5115	3.5-4.5
Lab Compaction (Revolutions) N(des)	CPL 5115	75
Stability, minimum	CPL 5106	28
Aggregate retained on the No. 4 sieve with at least 2 Mechanically Induced fractured faces, % minimum	CP 45	70
Accelerated Moisture Susceptibility Tensile Strength Ratio (Lottman), minimum	CPL 5109 Method B	80
Minimum Dry Split Tensile Strength, psi (kPa)	CPL 5109 Method B	30 (205)
Grade of Asphalt Cement, Top Layer		PG 64-28
Grade of Asphalt Cement, Layers Below Top		PG 58-28
Voids in the Mineral Aggregate (VMA), % min	CP 48	See TABLE 403-2
Voids Filled with Asphalt (VFA), %	AI MS-2	65-80
Dust to Asphalt Ratio Fine Gradation	CP-50	0.6 — 1.2
Dust to Asphalt Ratio Coarse Gradation	CP-50	0.8 — 1.6

Note: AI MS-2 = Asphalt Institute Manual Series 2
Note: The current version of CPL 5115 is available from the Region Materials Engineer
Note: Mixes with gradations having less than 40% passing the No. 4 sieve shall be approached with caution because of constructability problems.

Section 10 – Geotechnical and Roadway Pavements

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REVISION OF SECTIONS 401 AND 403
HOT MIX ASPHALT (GRADING SX) (75)

Note: 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.

All mix designs shall be run with a gyratory compaction angle of 1.25 degrees and properties must satisfy Table 403-1. CDOT Form #43 will establish construction targets for Asphalt Cement and all mix properties at Air Voids up to 1.0% below the mix design optimum.

TABLE 403-2
Minimum Voids in the Mineral Aggregate (VMA)

Nominal Maximum Size * Inches (mm)		***Design Air Voids **		
		3.5%	4.0%	4.5%
1 1/2	(37.5)	11.6	11.7	11.8
1	(25.0)	12.6	12.7	12.8
3/4	(19.0)	13.6	13.7	13.8
1/2	(12.5)	14.6	14.7	14.8
3/8	(9.5)	15.6	15.7	15.8

* The nominal 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.

Section 10 – Geotechnical and Roadway Pavements

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REVISION OF SECTIONS 401 AND 403
HOT MIX ASPHALT (GRADING SX) (75)

CDOT approved Warm Mix Asphalt (WMA) may be allowed on this project in accordance with CP-59. Unique requirements for WMA design, production and acceptance testing as documented during CDOT WMA approval shall be submitted and approved prior to creation of the Form 43 and before any WMA production on the project. Any delays to the project due to WMA submittal and review shall be considered within the Contractor's control and will be non-excusable.

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

Acceptance samples shall be taken at the location specified in either Method B or C of CP 41, as determined by the Region Construction and Materials personnel.

Aggregate, 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 Work.

Section 10 – Geotechnical and Roadway Pavements

REVISION OF SECTIONS 403 AND 620
HOT MIX ASPHALT TESTING, IGNITION FURNACE

If Reclaimed Asphalt Pavement is to be included in the Hot Mix Asphalt supplied on this project then the following shall apply:

Section 620.03 of the Standard Specifications is hereby revised for this project as follows:

In addition to the details shown in the plans for this project the field laboratory Class 2 shall include a forced air ignition furnace as described in CPL 5120. The Forced Air Ignition Furnace shall be installed per manufacturer's recommendations.

The 403 Pay Item of the Quality Assurance Schedule in the Field Materials Manual is hereby revised for this project as follows:

Asphalt content shall be measured following CPL 5120. Residual aggregate obtained by this method shall be used for gradation analysis according to CP 31.

Section 11 – Earthwork

Construction Requirements

Clearing and Grubbing

Trees, logs, limbs, stumps, brush, and trash and etc. cleared and grubbed from the Project shall be removed from the Site to an offsite location selected by the Contractor.

Removal of Existing Pavement

Existing pavement removed as part of this project, where required, shall first be sawcut vertically, full depth at the limits of removal. The cost of sawcutting and removal of the pavement, where required, shall be included in the cost of the work.

The existing pavement, base course and any detour pavement remaining on the old SH 92 alignment shall be removed. The roadbed shall be graded to match existing contours and stabilized as per Section 17 – Landscaping.

Excavations and Embankments

Embankment Material shall be in accordance to Technical Requirements Section 10 – Geotechnical and Roadway Pavements.

Benching Requirements

New embankment shall be benched into the existing slopes, where required in accordance with Section 203.06 of the Standard Specifications Materials Requirements.

Compaction Requirements

The type of compaction for the Project shall be as follows:

AASHTO T 99 for subgrades (including embankments and bases of cuts and fills) and structure backfill Class 2.

AASHTO T 180 for subbases, base courses and structure backfill Class 3.

Depth of moisture-density control for this Project shall be as follows:

Full depth of all embankments

6 inches for bases of cuts and fills

Reuse of Existing Materials

Asphalt millings are allowed to be used for embankment material and shall be placed in accordance with the Standard Specifications.

Section 11 – Earthwork

Project Special Provisions

REVISION OF SECTIONS 105, 106, AND 203

CONFORMITY TO THE CONTRACT OF EMBANKMENT

Sections 105, 106 and 203 of the Standard Specifications are hereby revised for this project as follows:

Subsection 105.03 shall include the following:

Conformity to the contract of embankment construction shall be determined in accordance with the following:

(a) *Quality Control Plan.* The Contractor shall be responsible for Quality Control (QC) for all embankment material on this project. The Contractor shall submit a written Quality Control Plan (QCP), including a methods statement, to the Engineer for acceptance. The QCP shall include but not be limited to the following:

(1) Maximum lift thickness of eight inches in accordance with subsection 203.06 or as directed.
(2) Compaction equipment capable of obtaining the specified compaction.
(3) Water trucks with an adequate distribution system that will apply water evenly.
(4) List of all inspection and materials testing forms and procedures to be utilized by the Contractor.
(5) Adherence to Table 106-4 requiring minimum testing frequency.

The Contractor shall submit the QCP at least five working days prior to the start of any embankment work. The Engineer's review of the QCP will not exceed two working days. Work shall not begin until the QCP has been accepted in writing by the Engineer.

(b) Documentation. The Contractor shall maintain current records of quality control operation activities, and tests performed. These records shall be on the forms shown in the QCP, and shall include as a minimum, the Contractor, or subcontractor, the number of personnel working, weather conditions, type of equipment being used, delays and their cause, and deficiencies along with corrective action taken. Such records shall cover both conforming and defective or deficient features. Additional documentation to the Engineer shall include all daily test results, daily inspection reports, daily non-compliance reports, and monthly certification reports. Copies of these records and a statement that work incorporated in the project complies with the Contract shall be submitted to the Engineer prior to payment for the work or upon request. Monthly certification reports shall be stamped with the seal of a Professional Engineer registered in Colorado. Failure to provide the Engineer with the necessary documentation

Section 11 – Earthwork

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REVISION OF SECTIONS 105, 106, AND 203

CONFORMITY TO THE CONTRACT OF EMBANKMENT

shall result in the suspension of payments on embankment until the documentation has been completed and accepted by the Engineer. CDOT Quality Assurance documentation shall not be used as supporting documentation for the Contractor's certification.

CDOT or CDOT's certified representative will be responsible for Quality Assurance (QA) and Independent Assurance Testing (IAT).

Subsection 106.03 shall include the following:

Testing of embankment construction shall conform to the following:

The supervisor responsible for the direct supervision for the process control sampling and testing shall be identified in the QCP and be qualified according to the requirements of CP-10 (Note: this will require a PE or a NICET Level III certification).

The technicians taking samples and performing tests must be qualified according to requirements of CP 10 (Note: this will require WAQTC qualification).

A process control technician shall be required to be on-site full time whenever earthwork activities are taking place.

The following frequency guide schedule for minimum materials sampling, testing and inspection shall be used for the elements shown in Table 106-4. The project verification sampling and testing procedures shown in the CDOT Field Materials Manual under the frequency guide schedule for minimum materials sampling, testing and inspection shall be used for all other items not shown.

Section 11 – Earthwork

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REVISION OF SECTIONS 105, 106, AND 203

CONFORMITY TO THE CONTRACT OF EMBANKMENT

Table 106-4

EXCAVATION AND EMBANKMENT TESTING SCHEDULE

Item	Minimum Testing Frequency Contractor's Process Control	Element	Minimum Testing Frequency CDOT verification Testing
203 EMBANKMENT	None Required	Soil Survey (Classification)	See CDOT Field Materials Manual for Frequency
	1 per soil type	Moisture – Density Curve	1 per soil type
	1 per 500 cubic yards or fraction thereof.	In-Place Density	1 per 1,000 cubic yards or fraction thereof.
	1 per 100 cubic yards or fraction thereof.	In-Place Density when within 100 ft. of Bridge Approach(s).	1 per 250 cubic yards or fraction thereof.
	1 per 5,000 cubic yards or fraction thereof.	1 Point Check	1 per 10,000 cubic yards or fraction thereof.

Qualifications for testing and personnel are contained in Section 203, Chapter 200 of the CDOT Field Materials Manual, CP-10, CP 13, CP 15, and CP 80, and the CDOT Inspectors Checklist.

Subsection 203.02 (a) shall include the following:

Unclassified Excavation shall include removal of unstable or unsuitable material within the roadway as determined and directed by the Engineer.

Section 11 – Earthwork

REVISION OF SECTION 206
SHORING

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

Subsection 206.03 shall include the following:

Shoring is defined as any temporary construction used to support the loads adjacent to any excavation or embankment.

The Contractor shall be responsible for locating, sizing, designing, and constructing shoring which provides all necessary rigidity, and supports the loads as required to facilitate construction.

When the height of shoring exceeds 4 feet above the base of the footing excavation, the Contractor shall provide shoring drawings to the Engineer for information only. The drawings shall be prepared by, and contain the seal and signature of a Professional Engineer registered in the State of Colorado. These drawings shall be approved and signed by the Contractor, and shall be provided to the Engineer at least ten days prior to construction.

Prior to placing construction and/or traffic loads, the Contractor's Professional Engineer shall certify in writing that shoring materials and construction have been inspected, and that all shoring and construction are in conformity with the approved shoring drawings. A copy of the certification shall be provided to the Engineer.

If embankment, construction, traffic, or other surcharge loads in excess of the original shoring design are to be placed adjacent to any shoring, the Contractor shall provide a signed letter from the Contractor's Professional Engineer prior to the load placement stating that the shoring will support the additional loads.

Shoring drawings shall include as a minimum, the following:

1. The size and grade of all structural materials.
2. Design notes, including design assumptions, and construction details.
3. Where applicable, shoring drawings shall restrict heavy equipment placement at specific locations adjacent to the shoring.
4. The Contractor's Professional Engineer shall determine whether de-watering of the shored excavation will be required; and, if so, shall describe the requirements (i.e., head added by the pump, flow rate, minimum pump size, etc.) and methods to be used for dewatering.
5. All other information determined by the Contractor's Engineer to be pertinent to the design and construction of the shoring.

Section 11 – Earthwork

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REVISION OF SECTION 206
SHORING

It is up to the Contractor to provide necessary shoring in order to build the retaining walls safely and to keep the disturbance from adversely affecting the soil mass outside the CDOT right of way.

Whether shoring is planned for use or not, the Contractor shall have a shoring plan ready for implementation should shoring become necessary due to backslope failure or the appearance of instability. This shoring plan shall be presented to the Engineer prior to beginning excavation for the retaining wall work.

Section 12 - Hydraulics

General

The Project shall include all Work to provide adequate highway drainage. This includes but not limited to culvert extensions, 18 inch Siphon replacement, new culverts, and the extension of the Big Gulch Concrete Arch culvert. The project shall be designed to accommodate the design flows and to meet project design criteria.

The flood design requirements for all proposed and existing structures shall be in accordance with the CDOT Drainage Design Manual and UPRR requirements, where applicable.

Stormwater Permits

The Contractor shall be cognizant of and adhere to the requirements of the various environmental and stormwater permits that will be necessary for construction and operation of this Project. Fines may be incurred upon the project for permit non-compliance by CDOT or other regulatory agencies. Any non-compliance fines shall be passed onto the Contractor.

Coordination with Other Agencies and Disciplines

The Contractor shall coordinate all water resource issues with affected regulatory agencies, where appropriate. The Contractor shall include CDOT in all meetings with the water resource regulatory agencies.

Hydrology

Hydrology calculations shall be in accordance with CDOT Drainage Design Manual. Hydrologic analysis is provided in the Reference Documents.

Hydraulic Design Requirements

Drainage Design Software

The following software (most recent versions) may be used in performing drainage design calculations.

1. USACE, HEC-RAS
2. FHWA, HY-8
3. Haestad Methods, StormCAD
4. Haestad Methods, Flow Master
5. Haestad Methods, Culvert Master
6. EMS-I, WMS
7. Inroads Storm and Sanitary

Section 12 - Hydraulics

Data Collection

The Contractor shall be responsible for all additional mapping and surveys necessary to meet the Contract Requirements.

The Contractor shall design drainage facilities compatible with existing or proposed drainage systems on adjacent properties, and shall preserve existing drainage patterns wherever possible. If existing drainage patterns must be changed due to design of the Project, the Contractor shall design and construct a solution that does not adversely impact property owners outside the ROW. The contractor's hydraulics design approach shall meet CDOT and FHWA requirements.

Roadways

Roadway component geometric configurations shall be designed to provide adequate drainage and minimize hydroplaning and icing problems.

Roadway Ditches

The roadway ditch design shall minimize erosion risk with the appropriate design and erosion control measures. The design shall be in accordance with the CDOT Drainage Design Manual and UPRR requirements where applicable.

Culverts

The Contractor shall remove and dispose all unused culverts.

Bridge Deck Drainage

Bridge deck stormwater shall be carried to either end of bridge and not allowed to flow through structure onto Railroad. Rundowns shall be used at abutments to reduce erosion.

Pipe Material Selection

Drainage pipes shall have water tight joints and comply with the current CDOT Pipe Material Selection Policy.

Drainage pipes shall meet Class 2 requirements as shown on Table 624-1 of the CDOT Standard Specifications.

Section 12 - Hydraulics

Deliverables:

Preliminary Hydraulic Report

The Contractor may base their design on the Hydraulics Report provided in the Reference Documents. The report illustrates a summary of pertinent hydraulic information in accordance with the CDOT Drainage Design Manual.

Drainage Design Deliverables

The Contractor shall prepare plans and specifications for all drainage facilities for the Project in a format that facilitates design review by the CDOT Project Engineer. The design deliverables for drainage facilities shall include plans, profiles, structure cross-sections, special details, and special provisions that are prepared for items that are not in compliance with the 2011 CDOT Standard Specifications and the revisions to Standard Specifications. Hydraulic design information shall be shown on the plans in accordance with the CDOT Drainage Design Manual.

Final Hydraulic Report

The Final Hydraulic Report (or addenda to previously Accepted reports), shall be prepared by the Contractor and submitted for acceptance prior to Final Project Acceptance. The Final Hydraulic Report shall follow the report outline in the CDOT Drainage Design Manual, and shall include references to relevant design criteria, circumstances influencing design, discussion of all drainage issues and drainage facilities, permanent water quality features, detailed design calculations, computer printouts, and appropriate maps and plans. The final drainage reports shall be sealed by a Colorado Licensed Professional Engineer, and one copy shall be submitted to the CDOT Project Engineer for Acceptance.

At a minimum, the Contractor shall submit the following to the CDOT Project Engineer for review, approval and/or acceptance:

Deliverable	Acceptance or Approval	Schedule
Final Hydraulic Report	Acceptance	Prior to Final Acceptance

Section 13 – Roadway Design

Administrative Requirements

The horizontal and vertical alignment may be adjusted to provide a more economical design that meets project constraints identified within this document.

The horizontal and vertical alignment shall tie into existing SH 92 at the same approximate limits as shown in the Reference Documents.

SH 92

The primary requirements for the design and construction of highways shall include, but are not limited to, the following documents (latest versions at project advertisement):

- CDOT, CDOT Design Guide, 2005.
- AASHTO, A Policy on Geometric Design of Highways and Streets, 2011 (PGDHS).
- AASHTO, Roadside Design Guide, Third Edition, 2006.
- CDOT, Standard Plans, M & S Standards, July 2012.
- CDOT, Standard Specifications for Road and Bridge Construction, 2011.
- BNSF/UPRR, Guidelines for Railroad Grade Separation Projects.

Other requirements provided on the plans shall govern the design and construction as applicable.

Design Requirements

Design of the Project shall be in accordance with the Technical Requirements Section 1 - General.

Design and Plan Submittals

In addition to the submittal requirements specified in this Section, the Contractor shall submit all design and plan documents to the CDOT Project Engineer for Acceptance as required in Section 3 – Quality Management.

Roadway Requirements

General

The Contractor shall provide a design alignment, to the CDOT Project Engineer during the design review, which demonstrates the ability to meet all design criteria and requirements.

The design speed for SH 92 shall be 55 mph.

Section 13 – Roadway Design

Typical Section

The SH 92 typical section shall consists of one 12-foot lane with 8-foot shoulders in each direction with the exception of acceleration/deceleration lane widening at Pleasure Park and eastbound climbing lane as shown in the Reference Documents. In sections where there are multiple lanes in one direction the shoulder width may be reduced to 4-foot in width. The Railroad crossing Structure (I-05-Z) shall have one 12-foot lane with 8-foot shoulder in each direction. The Structure typical section shall include bridge rail and chain link fence. See Reference Documents for roadway typical sections.

The SH 92 typical section shall provide for acceleration and deceleration lanes for turning movements in and out of the Pleasure Park access and eastbound climbing lane.

Cross Slope and Superelevation

Crown

The normal crown shall be -2% and shall be the center of the 2-lane section. The crown line shall not fall within a travel or turn lane in widened sections. The SH 92 roadway approach tie-ins shall have a cross slope and crown line that matches the proposed pavement cross slope and crown line.

Superelevation Rates

The maximum superelevation rate shall be 6%.

Stopping Sight Distance

For SH 92, the stopping sight distances and decision sight distances shall meet or exceed the requirements of Roadway Design Criteria Table, Exhibit 13-1. Stopping sight distances shall be determined in accordance with the PGDHS.

Fill and Cut Slopes and Clear Zones

The Contractor shall design cut and fill slopes to obtain clear zones and shall exhaust all design efforts to eliminate the use of guardrail. Where clear zones cannot be obtained within CDOT right-of-way, the use of guardrail shall be allowed as an option, subject to CDOT's evaluation and acceptance.

Clear zones shall be designed in accordance with the recommendations of AASHTO, Roadside Design Guide. *(Note: All slopes stated herein are in terms of horizontal: vertical)*

Roadside Slopes Adjacent to Pavement

Roadside slopes directly adjacent to mainline pavements shall be 4H:1V except, at accepted guardrail locations and where otherwise noted. The Point of Slope Selection (POSS) is

Section 13 – Roadway Design

defined as the location at which the roadside slope adjacent to the pavement ends, and the cut, or fill slope begins. The POSS shall be 8 feet from the edge of shoulder as shown in the Typical Sections included in the Reference Documentation.

Typical sections shall include a hinge point and maintain 2% positive drainage in the base course material as described in the CDOT Roadway Design Guide, Section 4.4 Typical Sections.

Fill Slopes

Fill slopes (H:V) shall be designed and constructed in accordance with the following priority.

1. Use 4:1 slopes where fill heights are less than 10 feet, and matches with existing conditions that can be obtained within the Project limits.
2. Use 3:1 slopes where fill heights exceed 10 feet, and matches with existing conditions can be obtained within the Project limits and clear zone can be obtained within the Project limits.
3. Use 2:1 slopes where fill heights exceed 15 feet, and matches with existing conditions that can be obtained within the Project limits and clear zone can be obtained within the Project limits.
4. Where the above conditions cannot be obtained the Contractor may use any of the following design approaches:

    A. Use 3:1 to 2:1 slopes with guardrail protection. Slopes steeper than 2.5:1 shall incorporate the use of soil retention blankets.

    B. Use retaining walls as necessary, with guardrail protection, to meet project constraints.

Fill slope areas shall be designed with ditches as necessary to control project drainage from flowing onto Railroad.

All fill slopes shall be rounded at their matches to provide for a pleasing appearance.

Cut Slopes

Cut slopes (H:V) shall be designed and constructed in accordance with the following priorities:

1. Cut slopes must be transitioned at the match with the 4:1 slopes adjacent to roadway pavement in such a manner to comply with the recommendations of the AASHTO Roadside Design Guide.
2. Use 4:1 or flatter slopes for cut slopes where matches with existing conditions can be obtained within the Project limits.

Section 13 – Roadway Design

3. Use 3:1 slopes for cut slopes where such slopes steeper than 4:1 are necessary to obtain matches with existing conditions within the Project limits.
4. Where the above conditions cannot be obtained, the Contractor may use any of the following design approaches:

    A. Use 3:1 to 2:1 slopes with guardrail protection. Slopes steeper than 2:5:1 shall incorporate the use of spray on mulch blanket.

    B. Use retaining walls as necessary, with guardrail protection, to meet project constraints.

Cut slope areas shall be designed with ditches as necessary to control project drainage from flowing onto Railroad.

All cut slopes shall be rounded at their matches to provide a pleasing appearance.

Cut slopes shall include a brow ditch at the top to control offsite storm water from eroding cut slope.

Guardrail

Guardrail shall only be allowed, with CDOT's evaluation and acceptance, wherever clear zone requirements cannot be achieved with cut/fill slope configuration within the acquired ROW. The Contractor shall design the guardrail needed for the structure approaches and other areas that do not meet clear zone requirements.

All guardrail shall be galvanized steel. All Posts shall be steel with composite blocks. All work shall be as specified in CDOT Standard M-606-1.

The Contractor shall pave asphalt a minimum of 1-foot behind all Type 3 guardrail installed as part of the Work.

Approach Roads

Roadway and field approaches shall be designed to have sufficient sight distance as per reference Standards. These approaches shall be Class 6 material and paved to the limits as shown in the Reference Documents.

Roadway approach side catch slopes within the SH 92 mainline clear zone shall be 6:1.

Construction Requirements

Removals

The Contractor shall be responsible for the removal of all items on the project designated for removal or found to conflict with project design elements. Removal items shall become the

Section 13 – Roadway Design

property of the Contractor unless designated to remain property of CDOT. Removal items shall include, but not be limited to: structures/portions of structures and obstructions, signs designated for removal, asphalt mat, culverts, and fencing. All removals shall be performed in accordance with Standard Specification 202.

Fencing/Gates

Fencing shall include combination wire as well as barbed wire. See Reference Documents for fence details. Deer Fence/Gates shall be replaced in locations where design requires removal of existing Deer Fence/Gates. Removed Deer Fence/Gates shall become the property of the adjacent land owner. Driveway Gates shall be the type as specified in the Project Special Provisions.

Deliverables

The Contractor shall submit the following to the CDOT Project Engineer.

Deliverable	Acceptance or Approval	Schedule
Design Exceptions	Approval	30 days before submitting RFC plans

All Deliverables shall also conform to the requirements of Section 3 Quality Management.

Section 13 – Roadway Design

Project Special Provisions

REVISION OF SECTION 607
DRIVEWAY GATES

Section 607 of the Standard Specifications is hereby revised for this project as follows:

Subsection 607.02 shall include the following:

Driveway gates provided for this project shall be a "Powder River" style 5 rail tubular steel gate.

Minimum gate specifications are:

Height	48 inch
Frame and rails	1-5/8 inch O.D. 16 gauge tube
Latch	Chain with keeper
Vertical stays	As recommended by the Manufacturer

Subsection 607.04 shall include all hardware necessary to complete the gate unit. This shall include a threaded rod-style hinge assembly and a chain-style latch with keeper as provided by the Manufacturer.

Section 14 – Signing, Pavement Marking, and Lighting

Design Requirements

The Contractor shall prepare signing and pavement marking designs and plans for all areas on the Project in accordance with the requirements of the following sections. These plans shall be a component of all Released for Construction Documents where any signing and pavement marking is required for the Work. No material, part, or attachment of any equipment shall be substituted or applied contrary to the manufacturer's recommendations and standard practices.

The Contractor shall prepare an inventory of all existing roadway signs, delineators and pavement markings within the limits of the project. The inventory shall be a basis for identification of like elements to be newly replaced as part of the Work, and shown on Released for Construction Documents for the Work.

All removals, resets and new permanent traffic control signs or devices shall be shown in the Contractor's Final Striping plans.

Permanent Signing and Delineation

The Contractor shall prepare permanent signing plans for acceptance by the CDOT Project Engineer before the installation of any permanent traffic control item.

Signing and Delineation Materials

The Contractor shall use P2 tubular steel sign supports for all Class I and Class II ground signs, as specified in CDOT Standard Plan S-614-8 and the Standard Specifications. All ground signs shall inclu.de breakaway devices per the CDOT Standard Plans.

Signs not requiring structural steel supports shall be designed according to the ground mounted sign support details shown in the CDOT Standard Plans.

Retroreflective sheeting shall be provided for all sign panels as specified in Standard Special Provision 630, Retroreflective Sign Sheeting.

Existing sign panels that are damaged, bent, or do not meet the retroreflectivity requirements of Standard Special Provision 630 shall be removed or replaced as applicable, and shall not be used elsewhere on the project.

Wood posts for mounting ground signs shall not be used.

All delineators shall have metal posts.

Permanent Pavement Marking

The Contractor shall prepare permanent striping plans for acceptance by the CDOT Project Engineer prior to construction of any permanent traffic control item.

Section 14 – Signing, Pavement Marking, and Lighting

Pavement Marking Materials

Pavement markings shall conform to the requirements specified herein, and the Standard Specifications, Standard Special Provisions, CDOT Standard Plans, and the MUTCD. The Contractor shall use Epoxy Pavement markings for permanent lane lines, centerline and edge lines.

Construction Requirements

Permanent Signing and Delineators

All removed traffic signs shall remain the property of CDOT.

The Contractor shall remove and dispose of the existing delineators within the Project that do not meet the requirements of this Section. Removed delineators shall become the property of the Contractor.

Temporary Pavement Markings

Where temporary pavement markings are placed on new or existing pavement surfaces, and where these markings cross the normal driving lanes, temporary pavement marking tape or other materials shall be used so they can be removed without scarring and shall be accepted by the CDOT Project Engineer.

Existing pavement markings shall first be removed by an acceptable method, before the placement of conflicting markings. The removal method shall not cause pavement scarring, and shall be accepted by the CDOT Project Engineer.

Section 14 – Signing, Pavement Marking, and Lighting

Deliverables

The Contractor shall submit the following to the CDOT Project Engineer.

Deliverable	Acceptance or Approval	Schedule
Existing Signing and Pavement Marking Material	Acceptance	Prior to Construction
Permanent Signing Plans	Acceptance	Prior to Construction
Permanent Striping Plans	Acceptance	Prior to Construction
Existing Pavement Marking Removal Method	Acceptance	Prior to Construction
Temporary Pavement Marking Removal Method	Acceptance	Prior to Construction

Section 15 - Structures

Administrative Requirements

The Contractor shall design, and construct all of the following structures required to make the Project fully functional and economical, in accordance with the Contract Requirements.

1. Structure number I-05-Z for the proposed Railroad crossing bridge at MP 14.4
2. Wall number I-05-A for East retaining wall at abutment 4
3. Wall number I-05-B for West retaining wall at abutment 1
4. Wall number I-05-C for Cast-in-Place retaining wall at M.P. 15.1
5. Big Gulch concrete arch culvert extension at station 429+87.82
6. Drainage and irrigation structures

The Railroad Crossing bridge and walls shown in the Reference Documents may be modified to provide a better value design, accelerated bridge construction and the construction cost that meets project constraints identified within this document and the current standards. Specifically, the Contractor may choose to adjust bridge length, structure geometry, and span-depth configuration to reduce wall heights, and eliminate UPRR crossing arm and controller box conflicts as shown in Reference Documents. The Contractor may choose to eliminate walls if all design criteria is met. The Contractor may also choose to modify Big Gulch Concrete Arch Culvert to meet the project constraints and current design requirements.

When the Contractor chooses to modify the structures, the Contractor shall clearly understand that additional work and costs occurred during the design and construction shall be the contractor's responsibility and there will not be any Change Order to CDOT.

Standards

The standards used for design and construction of the structures for this project shall be as listed on the plans, or as specifically referenced in this section.

The requirements of a document version (standard, specification, or other) referenced in this section will take precedent over the requirements of the documents listed on the plans.

Standards referenced by this section include:

All of the documentation found at the following web site address and any documents referenced therein:

http://www.coloradodot.info/library/bridge/bridge-manuals/bridge-design-manual

http://www.coloradodot.info/library/bridge/bridge-manuals/bridge-rating-manual

http://www.coloradodot.info/library/bridge/bridge-manuals/bridge-detail-manual

http://www.coloradodot.info/library/bridge/bridge-manuals/metric-bridge-geometry-manual

http://www.coloradodot.info/library/bridge/miscbridgedocs/techmemos/design-memos

http://www.coloradodot.info/library/bridge/miscbridgedocs/techmemos/rating-memos

http://www.coloradodot.info/library/bridge/design-standards

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http://www.coloradodot.info/business/designsupport/bulletins_manuals/construction-bulletins/current

http://www.coloradodot.info/business/designsupport/construction-specifications/2011-Specs/2011-specs-book

http://www.coloradodot.info/business/designsupport/construction-specifications/2011-Specs/standard-special-provisions

http://www.coloradodot.info/library/bridge/miscbridgedocs/accelerated-bridge-construction

AASHTO LRFD Bridge Design Specifications, Customary U.S. Units, 6th Edition, with 2013 Interim Revisions and any documents referenced therein.

AASHTO Guide Specifications for LRFD Seismic Bridge Design, 2nd Edition, with 2012 and 2014 Interim Revisions. Seismic design may be done using either the AASHTO Guide Specification for LRFD Seismic Bridge Design or the AASHTO LRFD Bridge Design Specifications, but shall be consistent and use one or the other for the design of all components of the bridge.

AASHTO the Manual for Bridge Evaluation, 2nd Edition, 2010 with 2013 Interim Revisions

ASHTO LRFD Bridge Construction Specifications, 3rd Edition, 2010 with 2014 Interim Revisions

The 2011 Edition of the Standard Specifications for Road and Bridge Construction as published by the Colorado Department of Transportation and any documents referenced therein. This includes the Standard Special provisions which include revisions to the 2011 Edition of the Standard Specifications for Road and Bridge Construction and any documents referenced therein.

Software

The following software shall be used for this Project:

AASHTOWare Bridge Rating, VIRTIS (Version 6.4.1),

MicroStation V8i, CDOT drawing standards are provided in this project for use. The contractor shall create a MicroStation Drawing environment that exactly matches the environment used internally at CDOT.

Design Requirements

Structure Selection Report

The structure selection reports provided in the Referenced Documents shall be considered preliminary. Should the contractor want to provide an alternative girder or wall type, the Contractor will be required to submit a new structure selection reports for the Engineer review and approval. Each report shall include the study of at least three structure types and provide

Section 15 - Structures

the summary of the recommended feasible structure type for the construction. The structure selection reports shall meet or exceed the requirements outlined in the CDOT Bridge Design Manual and the project requirements in this section.

Materials

Concrete

Concrete shall be in accordance with the Referenced Standards.

Concrete shall include Structural Concrete Coating as described in CDOT Standard Specification 601.14.

Structural Concrete Stain

Structural concrete Stain shall be in accordance with the Referenced Standards.

Prestressing Steel

Prestressing Steel shall be in accordance with the Referenced Standards.

Post-Tensioning Steel Systems

Post Tensioning Steel Systems shall be in accordance with the Referenced Standards.

Reinforcing Steel

Reinforcing Steel shall be Grade 60 reinforcing steel. All reinforcing steel shall be epoxy coated unless otherwise noted in accordance with the Referenced Standards.

Structural Steel

Structural Steel shall be AASHTO M270 Grade 50 (ASTM A-572) unless otherwise noted in accordance with the Referenced Standards.

Design Parameters

General

Design Parameters shall be in accordance with the Referenced Standards and the requirements contained in this section.

All design calculations and plans shall be performed in English (Standard) units.

Structure or bridge design, bridge rating, quantity estimate, bridge geometry and structural design check calculations shall have pages numbered and include a table of contents. All calculations shall identify which code is utilized and reference the appropriate section in the right hand column. References shall be included in the calculations to computer programs in the calculations. Computer documentation shall include: name of program, vendor, version

Section 15 - Structures

and release date; record of software output and verification of output with manual calculations or other recognized program; clear identification of input and output values and meaning; and check of input.

Loads and Forces

Load and Forces for bridge design shall be in accordance with the Referenced Standards and the requirements contained in this section.

1. Dead loads

   Utilities (future and existing): As Appropriate

   3" HMA Overlay (future and initial): 36 psf

   Unit Weight Prestressed Concrete:

   Shall be in accordance with the referenced Standards

2. Live Loads
   Shall be in accordance with the referenced Standards

3. Thermal Forces

   The following thermal coefficient and temperature ranges shall be used for designing the new structures:

   Thermal Coefficient: 0.000006/°F concrete, 0.0000065/°F steel

   Design Temperatures: shall be in accordance with the referenced Standards

4. Load Rating

   The Contractor shall load rate all highway bridges in accordance with the AASHTO Manual for Bridge Evaluation, and the CDOT Bridge Rating Manual, latest revisions.

Load and Forces for wall, and drainage and irrigation structure designs shall be in accordance with the Referenced Standards and Documents.

Geotechnical Data

See Section 10 – Geotechnical and Roadway Pavements for Geotechnical requirements. See Geotechnical Memorandums for structure foundation recommendations in the Reference Documents. The Contractor shall be responsible for final geotechnical reports and recommendations.

Bridges

Geometry

Bridge Geometry shall be in accordance with the referenced Standards and the requirements contained in this section.

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See Section 13 - Roadway and Section 12 - Hydraulics for additional structure requirements.

The bridge width shall have a curb-to-curb width equal to 40'-0".

Type

Bridge Type shall be in accordance with the referenced Standards and the requirements contained in this section. Structure type will not be restricted to those typically used by CDOT. Other types and components may be used, but will be allowed only if they have been accepted for general use by other transportation authorities and the Contractor can demonstrate that the design of the bridge type and components will perform well under the Project's environmental conditions, including frequent freeze-thaw cycles and anti-icing chemicals.

Experimental bridge types, timber bridges, masonry bridges, hunched girder bridges, all types of truss bridges and structural plate arches are not permitted. Post-tensioned cast-in-place concrete box girder type is not allowed since deck is not feasible to be replaced in the future bridge rehabilitation. Expansion devices in the deck and abutment wall connections are not allowed, but are required in the sleeper slabs at the approach slab ends.

The Contractor shall submit, to the Engineer for Approval, non-typical bridge types in the Structure Concept Plan.

The following structural requirements are to be met when new and innovative concepts or accelerated bridge construction (ABC) techniques are employed:

- A corrosion engineering consulting firm as approved by CDOT's Project Engineer with expertise in the prevention of corrosion for civil engineering structures shall be retained by the Contractor to review the integrity of the proposed connection details for a 75 year design life. The Contractor shall submit the results of this evaluation to the CDOT Project Engineer for CDOT's use in determining the acceptability of the proposed connection details.
- Field welded plates can only be used as temporary supports for bridge elements during erection and shall not be placed in a prestressed load path to prevent elements from seating properly.
- Match casting in prestressed elements shall be used to eliminate joint shifting in post-tensioned connections. Additionally, post-tensioning strands and bars shall be long enough to provide sufficient force for ultimate strength and service strength stress requirements after anchor set and long term losses have occurred.

Inspection Access

Bridge Inspection Access shall be provided in accordance with the referenced Standards.

Structure Components

Structure Components shall be in accordance with the referenced Standards and the requirements contained in this section.

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Bridge Rails

Bridge Rail Type 7 shall be used with 92 Inch Chain Link Fence attached on the bridge rail as shown in the Project Reference Documentation.

The final finish for the surfaces of the type 7 bridge rail and curbs shall be Class 2. All other exposed concrete surfaces shall receive a Class 1 final finish to one foot below the ground line.

A colored structural concrete stain shall be provided on the exposed bridge rails.

Approach Slabs

Bridge approach slabs are required at Structure I-05-Z and shall be in accordance with the referenced standards. All the provisions for bridge deck concrete shall also apply to approach slab concrete.

Decks

The Contractor shall provide a minimum concrete deck thickness of 8 inches in accordance with the Referenced Standards.

Open or filled grating decks and orthotropic decks will not be permitted.

Concrete decks designed to the simplified "Ontario", or any empirical methods, will not be permitted.

Precast Full-Depth Transverse Deck slabs if it is selected for accelerated bridge construction by the Contractor, shall be match cast or provided with an approved cast-in-place closure pour and longitudinally post-tensioned for continuous span bridge.

Precast pre-tensioned concrete deck forms with partial C-I-P concrete deck as an alternative of the ABC shall be temporarily supported on blocking with a 1:1 aspect ratio and in accordance with the Referenced Standards and Documents.

Permanent Steel Deck Forms are not allowed for all concrete girders.

Permanent deck forms shall not be allowed for T-girder deck slabs, or for box culverts or cantilevered portions of decks.

In order for the cast-in-place portion of concrete placed on top of the top flange of a Precast Double Tee or Precast Box Girders to be considered composite with the precast top flange, the total laminated deck thickness shall be 8 inches minimum, the cast-in-place thickness shall be 4-3/4 inches minimum, and the top surface of the precast top flanges shall be roughened.

Precast Double Tees, Precast Box Girders or longitudinal Precast Slabs without a cast-in-place deck placed on top will not be allowed. If any part of a deck resists tension the stress in the deck in this area shall not exceed 3-sqrt f'c. Minimum longitudinal steel in the top mat of cast in place decks shall be No. 4's at 6 inch spacing spliced to the negative moment steel reinforcing.

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Other joint and connection details shall be used upon approval by CDOT Project Engineer.

Concrete deck of the bridge shall be able to be replaced in the future deck rehabilitation project as required by the Referenced Standards.

Girders

Girders shall be in accordance with the referenced standards.

Negative camber is prohibited in Precast Concrete Members under full dead load, without live load and after all losses.

Deck Joints

The bridge is short enough as noted in accordance with the reference Standards to eliminate the need for deck expansion joints. In the event that the bridge is extended the Expansion joints shall be placed in accordance with the referenced Standards.

Expansion Joints

Expansion joints in sleeper slabs at approach slabs shall be continuous. The Contractor to submit approach slab details to CDOT to ensure expansion joints are continuous. If expansion joint approach is not acceptable, the contractor shall provide new expansion joints for entire width of Structure I-05-Z.

Overlays

The Contractor shall provide an initial 3" HMA surface over waterproofing membrane to enhance bridge deck durability. The waterproofing membrane shall be applied in accordance with Section 515 of the CDOT Standard Specifications. Traffic shall not be placed on bridge deck prior to waterproofing membrane and HMA overlay placement.

See Section 10 – Geotechnical and Roadway Pavements for HMA requirements.

Bearings

Bearings shall be designed and installed in accordance with the Referenced Standards.

Piers and Pier Caps

Piers and Pier Caps shall be in accordance with the Referenced Standards.

Abutments

Structure backfill in abutments shall be mechanically stabilized backfill and in accordance with the Referenced Standards. The length of cantilevered wingwalls and/or retaining walls from

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the end of the abutments of U-type abutment shall be 4 feet longer than the point of intersection of the embankment slope, along outside face of cantilevered wingwalls or retaining walls, with the roadway finished grade. If the required length of cantilevered wingwalls is longer than 16 feet from the end of U-type abutment diaphragms as recommended by the Reference Standards, the Contractor shall submit the detail and design for the Engineer Approval.

Structural Color

A colored Structural Concrete Stain finish will be required on exposed concrete surfaces. The color sample panel shall be equivalent to Federal Standard 595C Color, and is to be selected from test panels provided by the Contractor. All exposed surfaces shall receive Structural Concrete Stain to one foot below the ground line.

All structural steel shall be painted in accordance with Section 509 of the Standard Specifications. The color shall be equivalent to Federal Standard 595C color and is to be selected from test panels provided by the Contractor.

Slope Protection

Slope Protection shall be in accordance with the referenced Standards. The Contractor shall provide concrete slope paving on embankment slope to protect erosion around the abutments and wingwalls.

Foundations

Foundations of the bridge shall be in accordance with the Referenced Standards.

Drainage

See Section 12 – Hydraulics for bridge drainage requirements. No deck drains are allowed. No bridge rails with scuppers are allowed.

Utilities

Hanging of electrical or telephone conduits or utilities is not permitted under deck overhangs or on bridge rail.

Protection of utility conduits from the settlement of the abutment backfill shall be provided.

Utility placement and loads on bridge structures shall be approved by the Engineer.

Retaining Walls

General

Retaining Walls shall be in accordance with the Referenced Standards. If the Contractor proposes to modify and design the retaining walls rather than using the CDOT Worksheets,

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the design, details and design check calculations shall be submitted to the Engineer for approval.

Geometry

Retaining Wall geometry shall be in accordance with the Referenced Standards. The Contractor is allowed to modify wall geometry to meet the project constraints and current design requirements.

Type

Retaining Wall Type shall be in accordance with the Referenced Standards. Wall Type Selection Report shall be submitted to the Engineer for review and approval.

Design Requirements

Retaining Wall design shall be in accordance with the Referenced Standards. If the Contractor proposes to modify and design the retaining walls rather than using the CDOT Worksheets, the design, details and design check calculations shall be submitted to the Engineer for approval.

Characteristics

Retaining Wall characteristics shall be in accordance with the referenced Standards.

Design Reviews

Shop drawings of the bride and retaining walls shall be submitted to the Engineer for information and review only. The Contractor is solely responsible for shop drawing accuracy.

CDOT Bridge Rating Manual shall be used for the bridge rating package submittals.

Concrete Arch Culvert Extension (Big Gulch) and Dranage Structures

General

Concrete Arch Culvert, irrigation and drainage structures shall be in accordance with the referenced Standards. The contractor is allowed to modify and design the culvert to meet the project constraints and current design requirements.

Geometry

Concrete Arch Culvert geometry shall be in accordance with the Referenced Standards.

Type

Concrete Arch Culvert Type shall be in accordance with the Referenced Standards.

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Design Requirements

Concrete Arch Culvert, irrigation and drainage structure design shall be in accordance with the Referenced Standards. If the Contractor proposes to modify and design the culvert, the design, details and design check calculations shall be submitted to the Engineer for review and approval.

Characteristics

Concrete Arch Culvert characteristics shall be in accordance with the Referenced Standards.

Design Reviews

Shop drawings shall be submitted to the Engineer for information and review only. The Contractor is solely responsible for shop drawing accuracy.

Construction

General

Construction of all structures shall be in accordance with the Referenced Standards.

Deliverables

At a minimum, the Contractor shall submit the following to CDOT for review, Approval and/or Acceptance:

Deliverable	Acceptance or Approval	Schedule
Structure Selection Report (if re-submitted)	Approval	60 days before submitting RFC plans
RFC Structural Plans & Specifications Package (Structural Plans to be provided in both pdf and dgn formats) (see description below)	Acceptance	Prior to Construction
Structure Selection Reports	Approval	60 days before submitting RFC plans

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RFC Plans and Specification Package

The independent design check shall have been completed, and the original final structural design calculations shall be revised and corrected based on comments from the independent design check. Project aesthetic details shall have been incorporated into the Contractor's Drawings. The summary of quantities of all structures shall be included in structure drawing packages for information only in accordance with the Referenced Standards. All structural drawings shall have been completed and the final independent plan check of all the drawings shall be complete. Project special specifications shall have been completed. All changes or revisions resulting from the in-process design review shall be incorporated into the Final Design Documents. If required by earlier review comments, the final foundation report shall be updated and resubmitted with this package.

The Final Plans shall include as many Geology sheets as necessary for each bridge and retaining wall on the Project. Test holes that were done previous to the Project should be shown with a disclaimer. The Final Plans shall also include Hydraulics sheets for all bridges, and Bridge Deck Elevation sheets.

Contractor Drawings and Contractor Specifications for each structure shall be signed and sealed by the Contractor's designer in accordance with the professional registration laws of Colorado.

All calculations shall be signed and sealed by the Contractor's designer in accordance with the professional registration laws of Colorado. Copies in pdf format shall be made of all design and design check calculations for the Project and then submitted to CDOT.

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Project Special Provisions

REVISION OF SECTION 202
REMOVAL OF PORTIONS OF PRESENT STRUCTURE

DESCRIPTION

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

Subsection 202.01 shall include the following:

> This work shall include the removal of portions of the following as shown on the plans or as directed by the Engineer: arch culvert walls, headwall, footings, toewall, and bottom slab; culvert wingwalls, footings, and toewalls.

CONSTRUCTION REQUIREMENTS

Subsection 202.02 shall include the following:

> At least 10 days before beginning culvert removal the Contractor shall submit to the Engineer details of the removal operations showing the methods and sequence of removal and equipment to be used. If additional removal of unsound concrete is required, it shall be included in the work. All methods and equipment used to accomplish this item shall be approved by the Engineer.

In subsection 202.02 delete the sixth paragraph and replace with the following:

> A sawcutting approximately one inch deep shall be made to a true line along the limits of all removals. The minimum depth of a saw cut shall be 1 inch, or to the depth of the reinforcing steel, whichever occurs first. A sawcutting shall also be made along the limits of removal on all concrete faces which may be visible in the completed work.

Subsection 202.08 paragraph 3 shall include the following;

> Within 24 hours before new concrete is placed, surfaces upon which new concrete is to bond shall be sandblasted to roughen the surface and remove all fractured or loose particles in order to promote good bond with the new concrete.

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REVISION OF SECTION 206
STRUCTURE BACKFILL

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

Delete subsection 206.02, and replace with the following:

206.02 General. All structure backfill, bed course material, and filter material will be accepted in place.

(a) *Structure Backfill.* Class 1 with geotextile reinforcement layers (Mechanically Stabilized Backfill) and Class 2 structure backfill shall be composed of non-organic mineral aggregates and soil from excavations, borrow pits, or other sources. Material shall conform to the requirements of subsection 703.08. Class of material shall be as specified in the Contract or as designated.

Structure backfill (flow-fill) meeting the following requirements shall be used to backfill bridge abutments and culverts. The Contractor may substitute structure backfill (flow-fill) for structure backfill (class 1) or structure backfill (class 2) in other backfill areas of the project.

Ingredients	**Lbs./Cu.Yd**
Cement	50
Coarse Aggregate (AASHTO No. 57 or 67)	1700
Fine Aggregate (AASHTO M 6)	1845
Water	325 (or as needed)

The amount of water shall be such that the structure backfill (flow-fill) flows into place properly without excessive segregation. Approximately 39 gallons of water per cubic yard of structure backfill (flow-fill) is normally needed.

The Contractor may substitute 30 pounds per cubic yard of cement and 30 pounds per cubic yard of fly ash for 50 pounds per cubic yard of cement or may substitute 60 pounds per cubic yard of cement and 60 pounds per cubic yard of fly ash for 100 pounds per cubic yard of cement.

Recycled broken glass (glass cullet) is acceptable as part or all of the aggregate. Aggregate including glass must conform to the required gradations. All containers used to produce the cullet shall be empty prior to processing. Chemical, pharmaceutical, insecticide, pesticide, or other glass containers containing or

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REVISION OF SECTION 206
STRUCTURE BACKFILL

having contained toxic or hazardous substances shall not be allowed and shall be grounds for rejecting the glass cullet. The maximum debris level in the cullet shall be 10 percent. Debris is defined as any deleterious material which impacts the performance of the flowfill including all non-glass constituents.

(b) *Bed Course Material.* Material shall conform to the requirements of subsection 703.07. Upon approval, aggregate base course conforming to the requirements of subsection 703.03 may be used in lieu of bed course material.

(c) *Filter Material.* Class A, Class B, and Class C filter material shall conform to the requirements of subsection 703.09. Class of material shall be as specified or designated.

Delete paragraphs 13 and 14 of subsection 206.03 and replace with the following:

The maximum layer thickness for structure backfill (flow-fill) shall be 3 feet. The structure backfill (flow-fill) shall be consolidated with suitable mechanical vibrators operating within the flow-fill.

Vibrators shall be of a type and design approved by the Engineer. They shall be capable of frequencies of at least 10,000 vibrations per minute, in air. The vibration at any point shall be of sufficient duration to accomplish consolidation, but shall not be prolonged to the point where segregation occurs.

Subsection 206.07 shall include the following:

Structure excavation and structure backfill required for all culverts and extensions will not be measured and paid for separately, but shall be included in the work.

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REVISION OF SECTION 503
DRILLED CAISSONS

Section 503 of the Standard Specifications is hereby revised as follows:

Add Subsection 503.071 immediately following Subsection 503.07 as follows:

503.071 Cross-Hole Sonic Logging

(a) *General Requirements.*

The nondestructive testing method called Cross-hole Sonic Logging (CSL) shall be used on all drilled caissons.

The testing shall not be conducted until 48 hours after the placement of all concrete in a caisson, and must be completed within 20 calendar days after placement on production drilled caissons. The Engineer may specify a longer minimum time if special retarders, mix designs, or other factors result in slower-setting concrete.

The CSL tests shall be conducted by an experienced independent testing organization retained by the Contractor and approved by the Engineer prior to testing.

The CSL tests measure the time it takes for an ultrasonic pulse to travel from a signal source in one access tube to a receiver in another access tube. In uniform, good quality concrete, the travel time between equidistant tubes will be relatively constant and correspond to a reasonable concrete pulse velocity from the bottom to the top of the foundation. In uniform, good quality concrete, the CSL test will also produce records with good signal amplitude and energy. Longer travel times and lower amplitude/energy signals indicate the presence of irregularities such as poor quality concrete, voids, honeycomb and soil intrusions. The signal will be completely lost by the receiver and CSL recording system for the more severe defects such as voids and soil intrusions.

Upon completion of CSL testing all water shall be removed from access tubes and any other drilled holes. After the CSL results have been evaluated, required repair of defects has been conducted and the repair has been evaluated with another CSL survey, the CSL tubes shall then be grouted at the direction of the Engineer with an approved prepackaged grout having a minimum compressive strength of 4000 psi.

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REVISION OF SECTION 503
DRILLED CAISSONS

(b) *Preparation for Testing*

The greater of a minimum of four (4) CSL tubes or one (1) CSL tube per linear foot of the drilled caisson diameter, which maximum number of CSL tubes controls, shall be installed in each drilled caisson, equally spaced around the perimeter of the caisson at 90 degrees.

The CSL tubes shall be Schedule 40 steel with an inside diameter of 1 ½ inches. Galvanized steel will not be permitted. Substitution will not be permitted. Pipes shall have a round, regular internal diameter free of defects or obstructions, including any at pipe joints (all pipe joints shall be threaded without any couplings), in order to permit the free, unobstructed passage of a 1.35 inch diameter source and receiver probe. Tubes shall be watertight and free from corrosion with clean internal and external faces to ensure passage of the probes, and to provide good bond with the concrete.

CSL tubes shall be fitted with a watertight shoe on the bottom and a removable cap on the top. The tubes shall be securely attached to the interior of the reinforcement cage with a minimum cover of 3 inches.

CSL tubes shall be installed in each caisson in a regular, symmetric pattern such that each tube is placed the maximum distance possible from each adjacent tube, with a spacing of 90 degrees around the perimeter of the cage as specified above or as shown in the plans. The tubes shall be as near to parallel as possible, and are typically wire-tied to the reinforcing cage every 3 feet, or are otherwise secured such that the tubes stay in position during placement of the rebar cage and concrete.

The tubes shall extend from ½ foot above the caisson bottoms to at least 3-feet above the caisson tops. Under no circumstances shall the tubes be allowed to rest on the bottom of the drilled excavation. If the caisson top is sub-surface, the tubes shall extend at least 3 feet above the ground or water surface.

All joints in the tubes required to achieve full-length shall be made watertight. Care shall be taken during reinforcement installation operations in the drilled caisson hole so as not to damage the tubes. After placement of the reinforcement cage and prior to concreting the caisson, the tubes shall be filled with clean water as soon as possible (no later than 4 hours after placement of cage) and the tube tops capped or sealed to keep debris out of the tubes. Care shall be exercised in the removal of caps or plugs from the tubes after installation so as not to apply excess torque, hammering, or other stresses which could break the bond between the tubes and the concrete.

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REVISION OF SECTION 503
DRILLED CAISSONS

The Contractor shall submit to the Engineer for review the proposed CSL system including equipment schematics, material specifications, tube size, installation details, testing procedures, and joint connections at least 14 days prior to starting drilled caisson construction.

(c) *Typical CSL Test Equipment. Typical CSL test equipment consists of the following components:*

1. A microprocessor based CSL system for display of individual CSL records, analog-digital conversion and recording of CSL data, analysis of receiver responses and printing of CSL logs.

2. Ultrasonic source and receiver probes for 1-½ inches to 2-inch inside diameter pipe, as appropriate.

3. An ultrasonic voltage pulsar to excite the source with a synchronized triggering system to start the recording system.

4. A depth measurement device to determine and record depths.

5. Appropriate filter/amplification and cable systems for CSL testing.

(d) *CSL Logging Procedures*

Before the placement of concrete, a minimum of one tube per caisson shall be plumbed and the tube length recorded, including a notation of the tube projection above the caisson tops. Information on the caisson bottom and top elevations and/or length, along with construction dates shall be provided to the Engineer before the CSL tests.

CSL tests shall be conducted between the pairs of tubes encompassing the perimeter and the major diagonals. Testing shall be in accordance with ASTM D 6760. Additional logs shall be conducted at no additional cost to the Department in the event anomalies are detected.

The CSL tests shall be carried out with the source and receiver probes in the same horizontal plane unless test results indicate potential defects, in which case, the questionable zone may be further evaluated with angled tests (source and receiver vertically offset in the tubes). CSL measurements shall be made at depth intervals of 0.5 feet or less, and shall be done from the bottom of the tubes working upward to the top of each caisson. Probes shall be pulled simultaneously, starting from the bottoms of the tubes, over a depth-measuring device.

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DRILLED CAISSONS

Any slack shall be removed from the cables prior to pulling to provide for accurate depth measurements of the CSL records. Any defects indicated by longer pulse arrival times and significantly lower amplitude/energy signals shall be reported to the Engineer, and further tests shall be conducted as directed by the Engineer to evaluate the extent of such defects.

Additional NDT methods may be used to evaluate possible caisson defects including Single hole Sonic Logging, Gamma-Gamma Nuclear Density Logging, 3D Tomography, and/or Surface Sonic Echo and Impulse Response tests.

(e) *CSL Testing Results*

CSL results shall be presented to the Engineer in a report. The test results shall include CSL logs with analyses of:

1. Initial pulse arrival time versus depth
2. Pulse energy/amplitude versus depth

A CSL log shall be presented for each tube pair tested, with any defect zones indicated on the logs and discussed in the test report as appropriate.

Additional needed NDT results shall also be presented to the Engineer in a report format.

Copies of all data (written, electronic, etc.) obtained from the CSL and NDT inspections shall be submitted to the Department in an expedient manner. These submitted copies shall become the property of the Department.

(f) *Evaluation of CSL Test Results*

The Engineer will evaluate the CSL and NDT (if needed) results within 7 days of receipt from the Contractor and determine whether or not the drilled caisson construction is acceptable. The concrete condition shall be evaluated using the methodology described in Section 20.2.1 of the FHWA Geotechnical Engineering Circular Number 10 (Publication No. FHWA-NHI-10-016 Drilled Shafts: Construction Procedures and LRFD Design Methods, FHWA 2010). The Contractor shall provide consultants and/or personnel, on an as needed basis, who are experienced and competent performing the above NDT methods. If a defect is found by the additional NDT, then the cost of the additional NDT shall be the responsibility of the Contractor.

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DRILLED CAISSONS

If the NDT records are complex or inconclusive, the Engineer may require coring in accordance with subsection 503.071(g) below, or excavation of the caisson to verify caisson conditions. If a defect is confirmed, the Contractor shall pay for all coring or excavation costs, including grouting of all core holes.

The acceptance of each drilled caisson shall be the decision of the Engineer, based on the results of the caisson integrity testing report(s), including caisson coring, and other information on the caisson placement. Rejection of a caisson based on the caisson integrity testing shall require conclusive evidence that a defect exists in the caisson which will result in inadequate or unsafe performance under expected loads.

In the case that any caisson is determined to be unacceptable, the Contractor shall submit a plan for remedial repairs to the Engineer for approval. Any modifications to the foundation caissons and load transfer mechanisms caused by the remedial action will require calculations and working drawings stamped by a Professional Engineer registered in the State of Colorado for all foundation elements affected. All labor and materials required to perform remedial caisson repairs shall be provided at no cost to the Department and with no extension of the contract time.

(g) *Core Drilling of Drilled Caisson Concrete*

When directed by the Engineer, production drilled caissons that are determined to be unacceptable by the CSL tests shall be cored to determine the quality of the concrete. One core sample shall be taken from each defective caisson for the full depth of the irregularities and for three (3) feet above and below the irregularity.

Because it is desired to obtain a high percentage of core recovery for visual inspection and testing methods, equipment shall be as follows:

6. The core drill shall be in good condition and capable of delivering a smooth flow of power to the bit, both in rotation and down thrust. The pump shall be in good condition and of the positive displacement type. The pump shall be capable of delivering a minimum of 15 gallons of water per minute at 200 psi. It shall be equipped with a relief valve set to release at a maximum of 200 psi. It shall be equipped with a pressure gauge with range from 0 psi to 1,000 psi.

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7. The drill shall be size HW or larger. The core barrel shall be size HW or larger, M series, double-tubed, with a chromed inner barrel. The diamond set bit for each hole shall be of best quality, new, and with a minimum of four waterways. The Engineer may require a new bit or replacement of the core barrel at any time inspection indicates excessive wear or loss of diamonds.

8. The core drill machine shall be set so that the drill force will be exactly vertical and so there will be not more than five (5) feet of laterally unsupported drill rod between the bottom of the drill spindle (chuck) and the top of the caisson concrete when the hydraulic feed is in the up position. When longer laterally unsupported sections of drill stem are necessary, braced casing or rigidly braced guides must be used to prevent lateral whip.

An accurate log of cores shall be kept and the cores shall be placed in a suitable wooden crate and properly marked showing the caisson depth at each interval of core recovery. The cores along with two (2) copies of the coring log shall be turned over to the Engineer for inspection and testing.

Construction shall not proceed above the drilled caisson until the quality of the concrete in the caisson, as represented by the core samples, is determined to be acceptable and notification to continue construction is given by the Engineer.

If the quality of the concrete in a drilled caisson is determined to be acceptable, or after caisson remedial repairs are complete and accepted by the Engineer, the Contractor shall grout the core hole with an approved prepackaged grout having a minimum compressive strength of 4000 psi.

Subsection 503.09 shall include the following:

Cross-Hole Sonic Logging, including but not limited to all preparation, materials, labor, equipment testing, analysis of results, and reporting will not be measured and paid for separately and shall be included in the work.

Section 16 – Maintenance of Traffic

The Contractor shall conduct all work necessary to meet the requirements of this Section, including provisions for the safe and efficient movement of people, goods and services through and around the project while minimizing impacts to local residents, businesses and commuters.

All necessary work for Traffic Control Plans (TCP), Method of Handling Traffic (MHT), On-Site Detours, information for Business & Private Access points and Construction Requirements shall be documented for the project.

Traffic Operations

It is anticipated that the Contractor will be able to maintain traffic on the existing SH 92 alignment with minor temporary widening while the proposed bridge and roadway are being constructed.

The contractor shall maintain paved 11 foot lanes in each direction except where temporary one lane traffic during working hours is needed for the Work as approved by the CDOT Project Engineer.

Detour Requirements

Approaches

The Contractor shall maintain access to all driveways and approaches at all times during construction unless otherwise approved by the engineer.

Detour Design Speed

The minimum detour design speed shall be 40 miles per hour.

Detour Pavements

Only paved surfaces shall be used for detours. All detour pavements shall be maintained in good operating condition at all times detours are in use. Detours shall be devoid of potholes, uneven surfaces, rutting and shoulder drop-offs.

Maintenance of detour, including Hot Mix Asphalt for all detours shall be at the Contractor's expense.

Section 16 – Maintenance of Traffic

Temporary Barriers

A Type 7 temporary barrier is required to separate work zones and drop offs. Temporary impact attenuators are required when the end of the temporary barrier is located within the clear zone. A 2-foot shy distance to the Type 7 temporary barrier shall be maintained.

Work zone design criteria shall meet the requirements specified herein:

Transportation Management Plan (TMP)

The contractor shall develop a TMP per 630.10 of the 2011 CDOT Standard Specifications. TMP shall be submitted to CDOT for Acceptance prior to construction.

Traffic Control Plans (TCP)

Traffic Control Plans shall be submitted to CDOT for Acceptance prior to construction.

Method of Handling Traffic (MHT)

Each proposed MHT shall be accepted in writing by the CDOT Project Engineer and Contractor Superintendent before the corresponding stage of construction will be allowed to begin. The Contractor shall submit MHT's at least two working days prior to implementation of the particular MHT. The CDOT Project Engineer may extend review time if revisions are necessary.

Flagging

All flagging on the project required shall be shown on accepted MHT's, and documented in accordance with the contract shall be paid as part of the Contractor's original lump sum bid price. Operations that directly or indirectly impact traffic, the delivery of materials or equipment will require a flagger working under an approved MHT.

Railroad Flagging is required for any work within 25 feet from the UPRR Railroad tracks. It is anticipated that railroad flagging will be approximately 120 days, for a total cost of $180,000. This will be paid by CDOT out of the Project utility phase. Any payment of flagging hours greater than this amount will become the responsibility of the Contractor.

Public Information

The Contractor shall follow the requirements for Pubic Information as described in Technical Requirements, Section 4 – Public Information.

Lane Closures

Before any lane is closed or detour implemented, an appropriate MHT shall be accepted by the

Section 16 – Maintenance of Traffic

CDOT Project Engineer and Contractors' Superintendent. Lane restrictions must be acknowledged and Accepted by the CDOT Project Engineer 14 calendar days in advance of the closure, unless required by construction emergencies or other reasonably unforeseen events.

Construction Zone Speed Limits

Construction zone speeds shall be established at a minimum of 35 mph.

Construction Requirements

The Contractor shall remove all temporary traffic control devices when no longer in use.

Construction Signing

Construction signing within the Project limits and all detours shall comply with CDOT Standard Specifications and Standard Plans, the MUTCD, NCHRP 350, and all other applicable standards set forth herein.

The Contractor shall provide a minimum of two variable message signs for the duration of construction.

Deliverables

The Contractor shall submit the following to the CDOT Project Engineer:

Deliverable	Acceptance or Approval	Schedule
Transportation Management Plan	Acceptance	Prior to Construction
Traffic Control Plans	Acceptance	Prior to Construction
Method of Handling Traffic	Acceptance	2 days prior to implementation, 14 days prior to implementation for lane closures/ detours

Section 16 – Maintenance of Traffic

Project Special Provisions

REVISION OF SECTION 621

DETOUR PAVEMENT

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

621.01 This work consists of constructing detour pavement as shown on the plans.

621.02 The Contractor shall be responsible for quality control required to assure adequate quality of hot mix asphalt and aggregate base course used in the pavement.

621.03 The minimum thickness of detour pavement shall be 6" base course (Class 6) plus 3" hot mix asphalt. If the materials used require that the Contractor provide thicknesses greater than minimum to serve for the life of the detour pavement, these shall be provided at no additional cost. The detour pavement construction shall include grading, sawing existing pavement and pavement appurtenances, embankment material, planing, and other items of work necessary for the construction of detour pavement.

The removal of the Detour Pavement shall be accomplished in accordance with the applicable sub-sections of Section 202. The Contractor shall remove the detour pavement when it is no longer needed to maintain traffic.

The Contractor shall construct temporary ditches, temporary culvert pipe, and maintain existing storm drains necessary for the control of storm drainage.

The Contractor shall be responsible for ensuring all embankment construction for Detour Pavement is constructed in accordance with applicable portions of Section 203 of the Standard Specifications for Road and Bridge Construction, 2011.

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REVISION OF SECTION 621
DETOUR PAVEMENT

The Contractor shall provide smooth pavement transitions between new and existing roadways. Transverse joints between new and existing pavement shall be constructed with Hot Mix Asphalt. Grade differences shall not exceed 4 percent break-over. Transverse joint tapers shall be 20' horizontal to 1" vertical or flatter. Longitudinal joints which have a vertical drop-off shall be tapered with Hot Mix Asphalt. Tapers shall be 8 horizontal to 1 vertical or flatter.

621.04 The Contractor shall maintain the detour for the entire period that it is required. Any distress which affects the ride, safety, or serviceability of the detour roadway shall be corrected to the satisfaction of the Engineer at the expense of the Contractor. Correction/repairs shall be made within 48 hours from which it has been observed and reported. Failure to implement repair within the given time frame shall allow CDOT to acquire services from either CDOT Maintenance Program or from a private firm capable of performing repair work. Costs incurred for repair services rendered shall be subtracted from monies owed to the Contractor.

Section 16 – Maintenance of Traffic

REVISION OF SECTION 630
CONSTRUCTION ZONE TRAFFIC CONTROL DEVICES

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

Subsection 630.14 shall include the following:

The Contractor shall provide each flagger and the Project Engineer with a minimum 5-watt VHF radio in order to provide adequate communications during construction. The radios shall have sufficient range to communicate a minimum of 5 miles.

Subsection 630.10 shall include the following:

The method of handling traffic (MHT) submitted by the Contractor shall address radio communications.

Subsection 630.15 shall include the following:

Providing VHF radios and all costs associated with their use will not be paid for separately but shall be included in the work.

Section 16 – Maintenance of Traffic

REVISION OF SECTION 630
PORTABLE MESSAGE SIGN PANEL

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

Subsection 630.01 shall include the following:

This work shall consist of furnishing, operating, and maintaining portable message sign panels. The panels shall be in place on the project site at least 7 days prior to the start of active roadway construction, or as approved by the Engineer.

Subsection 630.031 is added following subsection 630.03 as follows:

630.031 Portable Message Sign Panel. Portable message sign panel shall be furnished as a device fully self contained on a portable trailer, capable of being licensed for normal highway travel, and shall include leveling and stabilization jacks. The panel shall display a minimum of three eight-character lines. The panel shall be a dot matrix type with either fluorescent yellow flip disks legend and/or LED legend on a flat black background. LED signs shall have a pre-default message that activates before a power failure. The sign shall have its own separate power source with independent back up battery-powered source. The sign shall be capable of 360 degrees rotation and be able to be elevated to a height of at least five feet above the ground to the bottom of the sign. The sign should be visible from one half mile under both day and night conditions. The message should be legible from a minimum of 650 feet. The sign shall automatically adjust its light source to meet the legibility requirements during the hours of darkness. The sign enclosure shall be weather tight and provide a clear polycarbonate front cover.

Message signs that are diesel generator powered shall be provided with a 20-gallon minimum capacity fuel tank. Solar powered message signs shall be capable of operating continuously for 10 days without any sun. All instrumentation and controls shall be contained in a lockable enclosure. The sign shall be capable of changing and displaying sign messages and other sign features such as flash rates, moving arrows, etc.

Section 16 – Maintenance of Traffic

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REVISION OF SECTION 630
PORTABLE MESSAGE SIGN PANEL

Each sign shall also conform to the following:

1. Flip-disks legend signs shall have fluorescent ultraviolet blacklight bulbs.

2. In addition to the onboard solar/generator power operation with battery back-up, each sign shall be capable of operating on a hard wire, 100 110V AC, external power source.

3. All electrical wiring, including connectors and switch controls necessary to allow all sign functions required by the specification, shall be provided with each sign.

4. Each sign shall include an operating and parts manual, wiring diagrams, and trouble shooting guide.

5. The portable message sign shall be capable of maintaining all required operations under Colorado mountain winter weather conditions.

6. Each sign shall be furnished with an attached license plate and mounting bracket.

7. Each sign shall be wired with a 7 prong male electric plug for the brake light wiring system. NAPA Part number TC 6215 Trailer Connector or equivalent will be suitable to fulfill the requirements of this specification.

Subsection 630.13 shall include the following:

The Contractor shall provide, operate, and maintain two complete Portable Message Sign Panels.

Maintenance, storage, operation, relocation to different sites during the project, and all repairs of portable message sign panels shall be the responsibility of the Contractor.

Section 16 – Maintenance of Traffic

REVISION OF SECTION 630
TRAFFIC CONE

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

In Subsection 630.05, second paragraph, the reflectorized material shall be AP 1000 Polyester (Reflexite Corp.), 3M Type III, Transparent (Reflexite Corp.), or 2010 Vinyl Cone Collar (Reflexite Corp.). Any other material is not acceptable unless its brightness is equivalent or greater than the types named.

Section 16 – Maintenance of Traffic

REVISION OF SECTION 630
IMPACT ATTENUATOR (TEMPORARY)

Section 630 of the Standard Specifications is hereby revised for this project to include the following:

DESCRIPTION

This work consists of furnishing, installing, certifying, moving, repairing, maintaining, and removing temporary impact attenuators in accordance with these specifications and in conformity with the lines and details shown on the plans or established.

MATERIALS

Each impact attenuator shall be selected from the Crash Cushion and End Treatment Application Chart as listed in the Safety Selection Guide on the CDOT Design and Construction Project Support web site. Impact attenuators shall conform to the requirements of the manufacturer and be capable of bi-directional shielding of the objects detailed and located on the plans. Filler materials shall be treated according to the manufacturer's recommendations to prevent freezing to a temperature of -50 °F.

The design speed of the impact attenuators for this project shall be 50 MPH. The attenuator shall meet the appropriate requirements for that design speed.

CONSTRUCTION REQUIREMENTS

If sand barrel arrays are used, the Contractor shall paint, with white epoxy paint, an outline and the weight of each barrel on the pavement prior to final placement. All numbers shall be a minimum of 6 inches high. Barrel type shall be one of those listed in the Safety Selection Guide.

The site shall be prepared to receive the impact attenuator by filling, excavating, smoothing, constructing the paved foundation pad, installing approved transition and anchoring, and all other work necessary for the proper installation of the attenuator.

The impact attenuator shall be fabricated and installed in accordance with the manufacturer's recommendations. The Contractor shall provide a copy of the manufacturer's installation instructions and parts list to the Engineer prior to installation of the device.

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REVISION OF SECTION 630
IMPACT ATTENUATOR (TEMPORARY)

Each installation shall be supervised and certified as correct upon completion by a representative of the device manufacturer or by an employee of the Contractor who is a certified installer. The certified installer shall have completed device training and shall be registered with the manufacturer as a certified installer. The Contractor shall submit all appropriate documentation to validate that the certified installer has completed device training and has been registered with the manufacturer as a certified installer.

Section 16 – Maintenance of Traffic

TRAFFIC CONTROL PLAN - GENERAL

The key elements of the Contractor's method of handling traffic (MHT) are outlined in subsection 630.09.

The components of the Traffic Control Plan (TCP) for this project are included in the following:

1. Subsection 104.04 and Section 630 of the specifications.
2. Latest revised Standard Plan S-630-1 (3/26/2012), Traffic Controls for Highway Construction and Standard Plan S-630-2.
3. Schedule of Construction Traffic Control Devices.
4. Tabulation of Traffic Engineering Items included in the plans for this project.
5. Construction Traffic Control details included in the plans for this project.

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

For construction impacting SH 92:

1. A total of two mainline traffic lanes shall be maintained on SH 92 at most times throughout the duration of this project. Except as noted below and approved by the Engineer. The Contractor's MHT submittals shall include information regarding construction access from the SH 92 mainline lanes or ramps to construction areas.

2. For certain portions of the work, closure of one mainline traffic lane on SH 92 may be required during work hours with flagging and approved MHT. All lane closures shall follow the current CDOT Region 3 Lane Closure Policy for this section of SH 92.
    a. No work on Holidays
    b. Contractor shall not close lanes during special events
    c. Contractor shall coordinate lane closures with adjacent projects
    d. Maximum delay time to the traveling public shall not exceed 10 minutes.

3. The Contractor shall install construction traffic control devices where they do not block or impede other existing traffic control devices or sidewalks for pedestrians, disabled persons or bicyclists. The Contractor is restricted from storing any materials, construction traffic control devices, signs, etc. in any median area.

4. Vertical cuts or fills greater than 1 inch resulting from construction operations adjacent to traffic lanes, or within the clear zone shall be temporarily sloped at a 6:1 or flatter slope, and delineated at 55 foot intervals immediately after removal operations to safeguard the traveling public.

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TRAFFIC CONTROL PLAN – GENERAL

5. Construction equipment used on this project shall meet the same minimum exhaust requirements as those specified by the manufacturer of the equipment.

6. The Contractor and subcontractors shall equip their construction vehicles with flashing amber lights. Flashing amber lights on vehicles and equipment shall be visible from all directions.

7. The Contractor shall maintain access to all roadways, side streets, walkways, alleyways, driveways, and hike/bike paths at all times unless otherwise directed by the Engineer. Parking areas temporarily disturbed by construction activities shall be restored to a useable condition during non-working hours. Such temporary parking shall utilize an all-weather surface. The Contractor shall develop an Access Maintenance Plan in coordination with, and based on the requirements of, the affected property owners and tenants, and submit it to the Engineer for approval prior to commencement of work. This plan shall detail all barricades, ramps, signs, and temporary means of access required by the property owners or tenants. Prior to commencing any work which affects access to a property, the Access Maintenance Plan for that property must be submitted and approved by the Engineer.

8. The Access Maintenance Plan shall be coordinated with all affected owners and tenants. The Access Maintenance Plan shall include documentation of this coordination, including the approval signature of each affected owner or tenant. Should the Contractor be unable to obtain approval and signatures, documentation of the efforts made to obtain said approval and signatures must be submitted. All access shall be maintained on surfaces equal to or better than those existing at the time the access is first disturbed. For short periods of time only as allowed by the Engineer, access may be maintained on an aggregate base course surfaces.

9. The Contractor shall maintain continuous access throughout the project for pedestrians and bicyclists.

10. The costs of maintaining access will not be paid for separately, unless otherwise provided, but shall be included in the work. Utilization of materials to be incorporated into the work may be permitted. However, any degradation or other contamination or destruction shall be corrected at the Contractor's expense prior to acceptance.

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TRAFFIC CONTROL PLAN – GENERAL

11. During non-construction periods (evenings, weekends, holidays, etc.) all work shall be adequately protected to insure the safety of vehicular and pedestrian traffic, as detailed in the Contractor's MHT. Excavations or holes shall be filled in or fenced when unattended. Drop-offs within the 18 ft. construction clearzone shall be protected by barrier or filled in during non-construction periods.

12. Whenever the Contractor removes, obliterates, or overlays any pavement markings, he /she shall replace them on a daily basis prior to opening the affected areas to traffic. All temporary pavement markings shall fully comply with the Standard Specifications and Special Provisions.

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

14. All personal vehicle and construction equipment parking is prohibited where it conflicts with safety, access, or the flow of traffic. Landscaped areas and roadway shoulders shall be kept clear of parking and storage of all personal and construction equipment except where approved by the Engineer.

15. The Contractor shall not place tack coat on any surface to be paved where traffic will be forced to travel upon fresh bituminous materials.

16. The Contractor shall be required to maintain temporary drives at any existing establishment that has singular access off of the roadways, unless otherwise approved in writing by the property owner.

17. All lane closures shall be subject to the approval of the Engineer. Request for each closure shall be made at least 24 hours in advance of the time the lane closure is to be implemented. Lane closures will not be allowed to remain unless being utilized in continuum for the intended purpose for which they were set up.

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TRAFFIC CONTROL PLAN - GENERAL

18. During no-working hours, the roadways shall be restored to a safe travel conditions for the free flow of traffic. Any maintenance required restoring the roadways to this condition, including the pavement patching and grading, shall be done prior to opening the areas to traffic or completing work for the day.

19. The Contractor shall clean the roadway of all construction debris before opening it to traffic.

20. All flagging stations used at night shall be illuminated with floodlights. Street, highway lights and "high mast lighting" may be used for flagging station illumination when approved by the Engineer. Floodlights shall be located and directed so as not to interfere with the sight of any motorists, and the cost to be included in the work. Night work will not be permitted unless prior approval is received by the Project Engineer. However, the Contractor shall provide a MHT for night work in cases of emergencies.

21. Prior to removal and resetting of any sign, the Contractor and Engineer shall prepare an inventory. Any signs damaged due to the Contractor's operations shall be replaced in kind or repaired by the Contractor at no additional cost to the project.

Section 17 – Landscaping

Landscape Requirements

Design Requirements

Landscape Plan

A final Landscape Plan will not be required for this project. Final seeding/stabilization shall be shown in the Stormwater Management Plan.

Construction Requirements

Preservation of mature vegetation: removal of adjacent vegetation shall be minimized where possible.

Grading techniques: cut and fill slopes shall be minimized and the cut line blended into the existing terrain. Reclamation of existing road bed shall be graded to match adjacent existing conditions.

All disturbed areas not within the work area will be returned to preconstruction elevation/contours and shall be reseeded with the CDOT approved native seed mix that is certified weed free.

Temporary Stabilization

Disturbed areas where work has temporarily halted shall follow the requirements of the 2011 CDOT Standard Specifications for Road and Bridge Construction, Sections 101, 107, 208, and 213.

Noxious Weeds

The Contractor shall control noxious weeds if present prior to disturbance, as needed throughout construction and until CDPS-SCP permit inactivation. Salvaged topsoil shall be treated with an herbicide for noxious weeds, if present, prior to final seeding.

Clearing and Work Area Limits Identification and Protection

The Contractor shall delineate the clearing and work limits for Acceptance by the CDOT Project Engineer (see Section 5, Migratory Birds for bird nesting survey requirements). Existing vegetation and or sensitive environments to remain shall be identified and protected. BMP's shall be used to prevent degradation of habitats adjacent to construction area.

Removal of Trees and Shrubs

Tree stumps within the roadway prism or within 10 feet of the edges of roadway pavements shall be completely removed and disposed off the Project site. All other tree stumps within the

Section 17 – Landscaping

Project shall be ground 3 feet below finished grade.
All trees or shrubs removed from the Project shall become the property of the Contractor and be completely disposed of off-site by the Contractor.

Permanent Native Seeding

Soils shall be prepared for native seeding. Slopes flatter than 2.5:1 shall be tilled into an even and loose seed bed 4 inches deep. Slopes 2.5:1 or steeper shall be left in a roughened condition. Slopes shall be free of clods, sticks, stones, debris, concrete and asphalt in excess of 4 inches in any dimension and brought to the desired line and grade.

Placement of soil conditioning and fertilizer, seeding and mulching shall not be done in a single operation, and shall be completed within 48 hours following each construction phase or prior to any winter shutdown work. Fertilizer shall not be used adjacent to wetlands and waterways. Refer to the Standard Specification Section 212 for additional requirements.

All disturbed areas within the Right–of-Way which are not surfaced shall be re-vegetated to replicate or enhance native vegetative communities. Re-vegetation species that attract wildlife to the Highway or practices that allow noxious weeds shall not be used.

Seeding for all areas with slopes flatter than 2.5:1shall be drilled 1/4-inch to 1/2-inch into the soil. In areas where machine seeding is impossible, hand broadcast at double the contract rate, and rake 0.25 inch to 0.5 inch into the soil.

The soil conditioning and fertilizer requirements for areas to be drill seeded or hand broadcast shall be 800 pounds per acre biological nutrient (organic material based fertilizer) and 600 pounds per acre humate per Standard Specification section 212.

Seeding for all areas with slopes 2.5:1 or steeper shall be hydro-seeded. Hydro-seed shall be applied at double the contract rate, in a slurry which contains seed, mulch tackifier, fertilizer, humate and spray-on hydraulic organic amendment. Slurry shall be applied from top of slope downward, in 50' vertical lifts unless otherwise approved by the Engineer.

The soil conditioning and fertilizer requirements for areas to be hydro-seeded shall be 600 pounds per acre biological nutrient (organic material based fertilizer) and 200 pounds per acre humate and 3500 pounds per acre spray-on hydraulic organic amendment, according to the Revision of Section 212.

All native seeding areas with slopes flatter than 2.5:1 shall be mulched and mechanically crimped with 1.5 tons per acre of weed free hay and applied with mulch tackifier.

Mulching application shall be 1.5 tons of certified weed free hay per acre mechanically crimped into the soil in combination with organic mulch tackifier per Standard Specification Section 212.

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Mulch tackifier shall be applied at a minimum rate of 200 lbs. per acre and according to Standard Revision Section 213.

Fill slopes steeper than 2.5:1 shall have soil retention blanket. Roadside ditches shall be lined with soil retention blanket and/or turf reinforcement (TRM) mat to contain the design flow width, designed based on the hydraulics of the ditch for both before and after the final stabilization is established. If soil retention blanket or TRM is used, mulch and mulch tackifier are not required.

Cut slopes steeper than 2.5:1 shall have spray-on mulch blanket applied. Spray-on mulch blanket shall not be used in areas of concentrated flow (i.e. ditchlines).

The Contractor shall use the following native seed mix for locations within the Project:

COMMON NAME	BOTANICAL NAME	LBS. PLS PER ACRE
Western wheatgrass	*Pascopyrum smithii* 'Arriba'	7.0
Alkali sacaton	*Sporobolus airoides* 'Salado'	0.2
Inland saltgrass	*Distichlis spicata*	1.3
Galleta	*Hilaria jamesii*	2.2
Sand dropseed	*Sporobolus cryptandrus*	0.1
Indian ricegrass	*Achnatherum hymenoides*	2.0
Blue grama	*Bouteloua gracilis* 'Hachita'	0.1
Bottlebrush squirreltail	*Elymus elemoides*	3.0
Oats	*Avena sativa*	3.0
Basin big sagebrush	*Artemisia tridentate tridentate*	0.1
Four-wing saltbush	*Atriplex canescens*	1.0
Scarlet globemallow	*Sphaeralcea coccinea*	0.1
TOTAL		20.1

Reseeding Operations and Corrective Stabilization

Prior to final acceptance:
1. Seeded areas shall be reviewed during the 14 day inspections by the Erosion Control Supervisor 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, mulched (certified weed free hay) and have mulch tackifier (or blanket) applied as necessary.
2. The Contractor shall maintain seeding/mulch/tackifier/blanket, mow to control weeds or apply herbicide to control weeds in the seeded areas until CDPS-SCP closure/Final Acceptance per Section 5 Environmental.

Deliverables

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The Contractor shall submit the following to the CDOT Project Engineer for acceptance:

Deliverable	Acceptance or Approval	Schedule
Seed Certification and Fertilizer Analysis	Acceptance	Prior to placing
Organic Soil Amendment Certificate of Compliance	Acceptance	At least 30 Days prior to its use on the Project

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REVISION OF SECTION 212
SOIL CONDITIONING

Section 212 of the Standard Specifications is hereby revised for this project as follows:

Delete the first paragraph in subsection 212.02 (b) 2. and replace with the following:

Soil conditioner: Soil conditioner shall consist of spray on hydraulic organic amendment, compost, biological nutrient, biological culture, or humic acid based material.

Subsection 212.02 (b) 2. shall include the following:

Spray on hydraulic organic amendment shall consist of mechanically processed straw, flexible flax fibers, peat moss, char, concentrated compost and trace minerals. The media shall consist of the following parameters:

Parameters	**Reported as**	**Requirements**
Spray on		
pH	pH units	5.5-8.5
Moisture content	%, wet weight basis	< 50%
Organic matter content	%, dry weight basis	>40%
Carbon Nitrogen Ratio	Ratio C:N	15 to 35:1
Man-made inert contamination	%, dry weight basis	< 1.5%
Straw and flexible flax Fiber	%, dry weight basis	40%
Sphagnum peat moss	%, dry weight basis	57%
Or Turkey compost	%, dry weight basis	57%

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REVISION OF SECTION 216
SOIL RETENTION COVERING

Section 216 of the Standard Specifications is hereby deleted for this project and replaced with the following:

DESCRIPTION

216.01 This work consists of furnishing, preparing, applying, placing, and securing soil retention blankets and turf reinforcement mats for erosion control on roadway ditches, slopes, or channels as designated in the Contract or as directed. For this project soil retention blankets shall be biodegradable. Photodegradable soil retention blankets will not be allowed

MATERIALS

216.02 Soil retention covering shall be either a soil retention blanket or a turf reinforcement mat as specified in the Contract. It shall be one of the products listed on CDOT's Approved Products List and 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 synthetic or natural fiber nettings to form a continuous matrix. 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 seed. 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).* Soil Retention Blanket (Straw-Coconut) shall be a machine produced mat consisting of 70 percent agricultural straw and 30 percent coconut fiber and be biodegradable. When specified lightweight polypropylene netting shall be 1.5 pounds per 1000 square feet; heavyweight netting shall be 2.9 pounds per 1000 square feet. Blankets shall be sewn together on 1.50 inch to 2 inch centers.

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REVISION OF SECTION 216
SOIL RETENTION COVERING

Netting shall be as follows:

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

When photodegradable netting is specified, the bottom side shall be lightweight polypropylene and the top side shall be heavyweight or lightweight polypropylene.

2. *Soil Retention Blanket* (*Excelsior).* Soil retention blanket (excelsior) shall consist of a machine produced mat of 100% curled wood excelsior with 80 percent, 6 inch or longer fiber length. It shall be either biodegradable or photodegradable. When specified lightweight polypropylene netting shall be on both sides of the blanket and shall be 1.5 pounds per 1000 square feet. Blankets shall be sewn together at a maximum of 4 inch centers.

   Netting shall be as follows:

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

   When photodegradable netting is specified, the bottom side shall be lightweight polypropylene. The top side shall be heavyweight or lightweight polypropylene.

3. *Soil Retention Blanket (Coconut).* Soil Retention Blanket (Coconut) shall be a machine produced mat consisting of 100 percent coconut fiber. It shall be either biodegradable or photodegradable.

   Netting shall be as follows:

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

   When photodegradable netting is specified, the bottom and top side shall be heavyweight polypropylene.

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REVISION OF SECTION 216
SOIL RETENTION COVERING

Table 216-1
PHYSICAL REQUIREMENTS FOR SOIL RETENTION BLANKET – PHOTODEGRADABLE OR BIODEGRADABLE BLANKETS

Product Class	Minimum Roll Width	Minimum Thickness ASTM D 6525	Acceptable Matrix Fill Material	Min. Mass per Unit Area ASTM D 6475	Size of Net Opening	
					Photo-degradable	Bio-degradable
1	6.5'	0.25"	Straw/Coconut	8 oz/sy	Minimum: 0.50"x0.50" Maximum: 0.75"x0.75"	Minimum: 0.50"x0.50" Maximum: 0.5"x1.0"
1	6.5'	0.25"	Excelsior	8 oz/sy	Minimum: 0.50"x0.50" Maximum: 1.0"x2.0"	NONE
2	6.5'	0.20"	Coconut Fibers	8oz/sy	Minimum: 0.50" x0.5" Maximum: 0.75"x0.75"	Minimum: 0.50"x0.50" Maximum: 0.5"x1.0"

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REVISION OF SECTION 216
SOIL RETENTION COVERING

Table 216-2
PERFORMANCE REQUIREMENTS FOR SOIL RETENTION BLANKET – PHOTODEGRADABLE OR BIODEGRADABLE BLANKETS

Product Class	Slope Application "C" Factor[1] ASTM D 6459	Channel Application Permissible Shear Stress[2] (Un-vegetated) ASTM D 6460	Minimum Tensile Strength ASTM D 6818
1	$\leq$ 0.10@3:1	2.00 lbs/sf	100 lbs/ft
2	$\leq$ 0.10@3:1	2.25 lbs/sf	125 lbs/ft

Notes:

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

2 Permissible shear stress is the minimum shear stress that a product must be able to sustain without physical damage or excess soil loss when it is installed on a bare soil channel. Failure is defined as ½ inch of soil loss during a 30 minute flow event in large scale testing.

Blankets shall be tested for physical properties and have published data from a pre-approved independent testing facility.

Large scale testing of Permissible Shear Stress and Slope Erosion Protection ("C" factor) shall be performed by a pre-approved independent testing facility.

A sample of the staples and a copy of the manufacturer's product data showing that the product meets the Contract requirements shall be submitted for approval at the environmental preconstruction conference.

(b) *Turf Reinforcement Mat.* Turf reinforcement mat (TRM) shall be a rolled mat consisting of UV stabilized, corrosion resistant, non-degradable synthetic fibers, filaments, or nets processed into a permanent three-dimensional matrix of the thickness specified in Table 216-3. TRMs shall provide sufficient thickness, strength and void space to permit soil filling and retention and the development of vegetation within the matrix. When TRM is not soil filled, the mat shall be tan in color. The class of TRM is defined by the physical and performance characteristics.

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REVISION OF SECTION 216
SOIL RETENTION COVERING

Table 216-3
PHYSICAL REQUIREMENTS[1] FOR TURF REINFORCEMENT MAT

Product Class	Minimum Roll Width	Minimum Thickness ASTM D 6525	Acceptable Matrix Fill Material[2]	Size of Net Opening[2]
1	6.5'	0.25"	Excelsior, Straw/Coconut, Coconut, or Polymer fibers	Minimum: 0.50"x0.50" / Maximum: 0.75"x0.75"
2	6.5'	0.25"	100% UV Stabilized Synthetic Fibers	0.50"x 0.50"
3	6.5'	0.25"	100% UV Stabilized Synthetic Fibers	0.50"x 0.50"

Notes:

1 For TRMs containing degradable components, all property values shall be obtained on the non-degradable portion of the matting alone.

2 For TRMs with nets and fill material. Netted TRMs shall be sewn together on 1.5 inch to 2 inch centers.

Table 216-4
PERFORMANCE REQUIREMENTS FOR TURF REINFORCEMENT MAT

Product Class	Tensile Strength MD ASTM D 6818	UV Stability @ 500 Hours ASTM D 4355	Maximum Permissible Shear Stress[1] (Vegetated) ASTM D 6460
1	125 lbs/ft	80%	6.0 lbs/sf
2	150 lbs/ft	80%	8.0 lbs/sf
3	175 lbs/ft	80%	10.0 lbs/sf

Notes:

1 Permissible shear stress is the minimum shear stress that a product must be able to sustain when placed on a fully vegetated channel without physical damage or excess soil loss. Failure is defined as ½ inch of soil loss during a 30 minute flow event in large scale testing.

TRMs shall be tested for physical properties and have published data from a pre-approved independent testing facility.

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REVISION OF SECTION 216
SOIL RETENTION COVERING

Large scale testing of Permissible Shear Stress will be performed by a pre-approved independent testing facility.

A sample of the staples and a copy of the manufacturer's product data showing that the product meets the Contract requirements shall be submitted for approval at the environmental preconstruction conference.

(c) *Staples.* Staples shall be made of wire:

For use in Channel: 0.165 inches, "U" shaped staples shall be 8 inches long and have a 1 inch crown.

For use on Slope: 0.165 inches, "U" shaped staples shall be 8 inches long and have a 1 inch crown.

"T" shaped pins shall not be used.

CONSTRUCTION REQUIREMENTS

216.03 The Contractor shall install soil retention coverings using the following procedure:

(1) Prepare a stable and firm soil surface free of rocks, weeds, clods, roots, sticks, rivulets, gullies, and other obstructions.
(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.
(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 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.

If filling a TRM with soil, the Contractor shall:

(1) Place 3 inches of topsoil or soil amended with soil conditioning.
(2) Apply seed and rake into soil.
(3) Install TRM
(4) Place 0.5 inch to 1 inch of topsoil or soil amended with soil conditioning into the matrix to fill the product thickness.

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(5) Apply seed and rake into soil.

(6) Install soil retention blanket (Class 1) over the seeded area and TRM.

When applicable, the covering shall be unrolled with the heavyweight polypropylene netting on top and the lightweight polypropylene netting shall be in contact with the soil.

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. When specified by the manufacturer, trench depth shall be increased up to 12 inches in depth. 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 stapled at 1 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 applied on the slope 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 trench and stapled. If a slope runs into a receiving water 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 at the minimum rate shown on the plans. Staple spacing shall be reduced where required due to soil type or steepness of slope.

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. When specified by the manufacturer, trench depth shall be increased up to 12 inches in depth. Before backfilling begins, staples shall be

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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 be anchored every 30 feet with a check slot. 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 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 be performed at the Contractor's expense.

Section 18 - Maintenance During Construction

Responsibilities for Maintenance

The responsibility for performing maintenance on SH 92 within the project limits shall be the Contractor's responsibility and shall conform to Sections 104.04, 105.19 and 107.17 of the 2011 Standard Specifications for Road and Bridge Construction, and as described herein.

Initiation of Contractor Maintenance Responsibilities

The Contractor will commence maintenance responsibilities beginning at the time of Notice to Proceed for Construction through Substantial Completion, including any and all project suspensions for weather and or seasonal shut downs.

Termination of Contractor Maintenance Responsibilities

All responsibilities assigned to the Contractor shall remain as such until Project Completion.

Maintenance Responsibilities of the Contractor

CDOT will provide snow plowing on paved lanes open to traffic. All other maintenance shall be the responsibility of the Contractor. The Contractor shall perform all required maintenance Activities including, but not limited to:

- Patching and repair of existing pavements.
- Patching and repair of all existing structures included as a part of the Work.
- Repair of shoulder drop-offs.
- Snow and ice removal for lanes closed to traffic, including areas needed for the placement of channelization devices in tapers and tangents sections.
- Maintenance and cleaning of reflective surfaces on delineators and sign panel faces, and refurbishing pavement markings.
- Repair and or replacement of damaged guardrail and barriers.
- Daily trash and debris removal within project limits.

Payment for Maintenance During Construction

Payments for maintenance during construction shall be included in the original Lump Sum Bid price.

Section 19 – Modification to Standard Specifications

Construction Requirements

This section sets forth modifications to the CDOT Standard Specification for Road and Bridge Construction for this Project.

Subsections of Section 100 listed below are revised for this project as indicated. Subsections of Section 100 not listed below remain in force, except as modified by Standard Special Provisions or superseded by other Project Special Provisions.

For Sections 200 and above, Project Special Provisions are included with the pertinent Technical Requirements of Sections 1 through Section 18.

This Section contains Standard Special Provisions that are applicable to the Project.

Any references to other standards, codes, or criteria, or to the latest version of other standards, codes, or Technical Requirements of the Contract Documents shall mean the latest version at the Proposal Due Date.

101 – Definitions and Terms

Subsection 101 shall include the following:

Definitions set forth in Technical Requirement Section 1 – General supersede the definitions that are identical in Section 101 and the remaining definitions are Contract requirements.

102 - Proposal Requirements and Conditions

102.02 - Contents of Proposal Forms

Delete the first paragraph of Subsection 102.02 and replace with the following:

The contents of Proposal Forms requirements are set forth in the Instructions to Proposers.

103 - Award and Execution of Contract

103.02 – Award of Contract

Subsection 103.02 shall include the following:

Award and execution of the Contract Requirements are set forth in the Instructions to Proposers.

Section 19 – Modification to Standard Specifications

104 - General Provisions Regarding Scope of Work

104.01 - Intent of Contract

Subsection 104.01 shall include the following:

The intent of the Contract requirements is set forth in the Instructions to Proposers and Technical Requirements Sections 1 thru 19 of the Contract Documents.

104.04 - Maintaining Traffic

Subsection 104.04 shall include the following:

Maintaining traffic requirements are set forth in the Technical Requirements of Section 16 - Maintenance of Traffic and Section 18 - Maintenance During Construction Sections of the Contract Documents.

105 - Control of Work

105.02 - Plans, Shop Drawings, Working Drawings, Other Submittals, and Construction Documents

Subsection 105.02 shall include the following:

Plans, shop drawings, working drawings and construction documents requirements are set forth in the Technical Requirement Section – 3 Quality of the Contract Documents.

105.09 - Coordination of Plans, Specifications, Supplemental Specifications, and Special Provisions

Delete Subsection 105.09 and replace with the following:

The order of precedence is set forth in the Technical Requirement Section 1 – General of the Contract Documents.

105.13 - Construction Stakes, Lines, and Grades

Delete Subsection 105.13 and replace with the following:

Construction stakes, lines and grades requirements are set forth in the Technical Requirement Section 9 – Survey of the Contract Documents.

Section 19 – Modification to Standard Specifications

105.19 - Maintenance During Construction

Delete subsection 105.19 and replace with the following:

Maintenance During Construction requirements are set forth in the Technical Requirement Section 18 – Maintenance During Construction of the Contract Documents

107 - Legal Relations and Responsibility to Public

107.02 - Permits, Licenses, and Taxes

Subsection 107.02 shall include the following:

The Contractor is responsible for the permits that are listed in the Technical Requirements of Sections 1 through 18 of the Contract Documents.

107.07 - Public Convenience and Safety

Subsection 107.07 shall include the following:

The safety and convenience of the public and the protection of persons and property shall be provided as specified in the Technical Requirement Section 16 - Maintenance of Traffic and Section 18 –Maintenance During Construction of the Contract Documents.

107.10 - Barricades and Signs

Subsection 107.10 shall include the following:

The use of barricades and signs requirements is set forth in the Technical Requirement Section 14 – Signing of the Contract Documents.

107.12 - Protection and Restoration of Property and Landscape

Subsection 107.12 shall include the following:

Protection and Restoration of Property and Landscape requirements are set forth in the Technical Requirement of Section 5 – Environmental and Technical Requirement of Section 17 – Landscaping of the Contract Documents.

107.19 - Furnishing Right-of-Way

Subsection 107.19 shall include the following:

Furnishing right-of-way requirements are set forth in the Technical Requirements of Section 8 – Right-of-Way of the Contract Documents.

Section 19 – Modification to Standard Specifications

107.23 - Archaeological and Paleontological Discoveries

Subsection 107.23 shall include the following

Archaeological and Paleontological Discoveries requirements are set forth in the Technical Requirement of Section 5 – Environmental of the Contract Documents.

107.24 - Air Quality Control

Subsection 107.24 shall include the following

Air Quality Control requirements are set forth in the Technical Requirement of Section 5 – Environmental of the Contract Documents.

107.25 - Water Quality Control

Subsection 107.25 shall include the following

Water Quality Control requirements are set forth in the Technical Requirement of Section 5 – Environmental of the Contract Documents.

108 - Prosecution and Progress

108.02 - Notice to Proceed

Subsection 108.02 shall include the following:

Schedule requirements are set forth in the Technical Requirement of the Instructions to Proposers of the Contract Documents.

108.03 - Schedule

Subsection 108.03 shall include the following:

Schedule requirements are set forth in the Technical Requirement of Section 2 – Project Management of the Contract Documents.

108.05 - Limitation of Operations

Subsection 108.05 shall include the following:

Limitation of Operations requirements are set forth in the Technical Requirement of Section 16 – Maintenance of Traffic of the Contract Documents.

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109 - Measurement and Payment

109.01 - Measurement of Quantities

Delete Subsection 109.01 and replace with the following:

Measurement of Quantities requirements are set forth in the Technical Requirement of Section 2 – Project Management of the Contract Documents.

109.02 - Scope of Payment

Delete Subsection 109.02 and replace with the following:

Scope of Payment requirements are set forth in the Technical Requirement of Section 2 – Project Management of the Contract Documents.

109.03 - Compensation for Altered Quantities

Delete Subsection 109.03

Section 19 – Modification to Standard Specifications

STANDARD SPECIAL PROVISIONS

The following Standard Special Provisions shall be used by the Contractor for design and construction of the Work. The Standard Special Provisions are revisions to the 2011 Standard Specifications for Road and Bridge Construction.

	Date	No. of Pages
Revision of Section 103 – Escrow of Proposal Documentation	(May 5, 2011)	2
Revision of Section 105 – Disputes and Claims for Contract Adjustments	(January 31, 2013)	31
Revision of Section 105 – Hot Mix Asphalt Pavement Smoothness	(April 26, 2012)	7
Revision of Section 105 – Violation of Working Time Limitation	(February 3, 2011)	1
Revision of Section 106 – Certificates of Compliance and Certified Test Reports	(February 3, 2011)	1
Revision of Section 106 – Material Sources	(October 31, 2013)	1
Revision of Section 106 – Hot Mix Asphalt – Verification Testing	(July 29, 2011)	2
Revision of Sections 106, 627 and 713 - Glass Beads for Pavement Marking	(February 8, 2013)	2
Revision of Section 107 – Project Payrolls	(May 2, 2013)	1
Revision of Section 107 - Responsibility for Damage Claims, Insurance Types, and Coverage Limits	(February 3, 2011)	1
Revision of Section 108 – Liquidated Damages	(May 2, 2013)	1
Revision of Section 108 – Subletting of Contract	(January 31, 2013)	1
Revision of Section 108 and 109 – Payment Schedule (Multiple Construction Years)	(Nov. 15, 2013)	1
Revision of Section 109 – Asphalt Cement Cost Adjustment (Asphalt Cement Include in the Work)	(April 5, 2013)	2
Revision of Section 109 - Compensation for Compensable Delays	(May 5, 2011)	1
Revision of Section 109 – Fuel Cost Adjustment	(February 3, 2011)	2
Revision of Section 109 – Measurement of Quantities	(February 3, 2011)	1
Revision of Section 109 – Prompt Payment	(January 31, 2013)	1
Revision of Section 203 – Imported Material for Embankment	(February 3, 2011)	2
Revision of Sections 203, 206, 304 and 613 - Compaction	(July 19, 2012)	2
Revision of Section 206 – Imported Material for Structure Backfill	(July 19, 2012)	2
Revision of Section 206 – Structure Backfill (Flow-Fill)	(April 26, 2012)	2
Revision of Sections 206 and 601 – Backfilling Structures that Support Lateral Earth Pressures	(July 29, 2011)	1
Revision of Section 208 – Erosion Log	(January 31, 2013)	1
Revision of Section 212 – Seed	(April 26, 2012)	1
Revision of Section 213 – Mulching	(January 31, 2013)	4
Revision of Section 250 – Environmental, Health and Safety Management	(July 19, 2012)	1
Revision of Section 401 – Compaction of Hot Mix Asphalt	(April 26, 2012)	1
Revision of Section 401 – Compaction Pavement Test Section (CTS)	(July 19, 2012)	1
Revision of Section 401 – Temperature Segregation	(February 3, 2011)	1
Revision of Section 401 and 412 – Safety Edge	(May 2, 2013)	2
Revision of Sections 412, 601, and 711 - Liquid Membrane-Forming Compounds for Curing Concrete	(May 5, 2011)	1
Revision of Section 504 – Concrete Panel Facing MSE Wall	(February 3, 2011)	12
Revision of Section 504 – Concrete Block Facing MSE Wall	(February 3, 2011)	13
Revision of Section 518 – Bridge Expansion Device	(October 31, 2013)	1
Revision of Section 601 – Concrete Batching	(February 3, 2011)	1

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Revision of Section 601 – Concrete Finishing	(February 3, 2011)	1
Revision of Section 601 – Concrete Form and Falsework Removal	(July 28, 2011)	2
Revision of Section 601 – Concrete Slump Acceptance	(July 29, 2011)	1
Revision of Section 601 – Depositing Concrete Under Water	(May 2, 2013)	1
Revision of Section 612 – Delineators	(February 3, 2011)	1
Revision of Section 618 – Prestressed Concrete	(April 26, 2012)	24
Revision of Section 627 and 708 – Pavement Marking Paint	(January 31, 2013)	2
Revision of Section 630 – Signs and Barricades	(January 31, 2013)	1
Revision of Section 703 – Aggregate for Bases	(October 31, 2013)	1
Revision of Section 703 – Aggregate for Hot Mix Asphalt	(November 1, 2012)	2
Revision of Section 703 – Concrete Aggregate	(July 28, 2011)	1
Revision of Section 712 – Geotextiles	(November 1, 2012)	2
Revision of Section 712 – Water for Mixing or Curing Concrete	(February 3, 2011)	1
Revision of Section 713 – Epoxy Pavement Marking	(October, 31, 2013)	2
Revision of Section 713 – Reflectors for Delineators and Median Barriers	(May 2, 2013)	1
Affirmative Action Requirements – Equal Employment Opportunity	(February 3, 2011)	10
Minimum Wages Colorado, U.S. Department of Labor General Decision Numbers CO140016 thru CO140024, Highway Construction, Statewide	(January, 03 2014)	56
On the Job Training	(July 29, 2011)	3
Partnering Program	(February 3, 2011)	1
Railroad Insurance	(February 3, 2011)	1
Required Contract Provisions – Federal-Aid Construction Contracts	(July 19, 2012)	14
Special Construction Requirements – Fire Protection Plan	(November 1, 2012)	2