

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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7. Construct signing and pavement marking. See plan details in Reference Documents and accompanying Technical Requirements.
8. Implementation of construction staging, traffic detours and traffic control during construction. See plan details in Reference Documents and accompanying Technical Requirements.
9. 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.
10. All work shall be completed within existing and proposed CDOT ROW, Temporary Easements and Permanent Easements.
11. Coordination of Design and Construction with CDOT, UPRR and Utility Owners.

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

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- Section 9 – Survey
- Section 10 – Geotechnical and Roadway Pavements
- 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.

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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

Items designed as shown in the Reference Documents (Plan Sheets) that the Contractor determines may remain the same will be signed and sealed by CDOT. The Contractor's Design Manager will be responsible to sign and seal all design elements that have been modified.

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.

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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.

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

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- Maintenance of Traffic details
- Roadway cross sections including earthwork information
- 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 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 the purpose(s) intended.

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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

Disadvantaged Business Enterprise (DBE) Contract Goal

This is a federally-assisted construction project. As described in the CDOT DBE Standard Special Provision, the Bidder shall make good faith efforts to meet the following contract goal:

7.5% Percent DBE participation

~~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:~~

~~_____ ****Dollar amount of work to be contracted to underutilized DBEs (UDBEs)**~~
~~Percentage = 100 X _____~~
~~_____ **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.

The number of calendar days to complete the work shall include three individual periods to allow for UPRR plan review time. These periods shall be 30 days each for 30% design review, 100% design review and Construction Submittal. In cases in which these review periods are exceeded due to the UPRR delay, CDOT will extend the Contract time as a non-compensable delay for the days that the review process takes place.

(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.

$$D = (C - B) \bullet (\text{the daily cost})$$

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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.

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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 107 of 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.

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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.

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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.

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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.

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- 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.

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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.

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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.

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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.

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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.

<u>Force Account Item</u>	<u>Estimated Quantity</u>	<u>Amount</u>
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