

**SECTION 631
ALTERNATIVE BRIDGE DESIGN & CONSTRUCTION**

Section 631 is hereby added to the Standard Specifications for this project as follows:

DESCRIPTION

631.01 All bidders on this project have the option of submitting a bid for the design and construction of an alternative bridge structure (“alternative bridge”), in lieu of submitting a bid for the construction of the segmental concrete bridges as shown in the Plans and referred to herein as the “default bridge”.

Bidders are not required to submit a bid for an alternative bridge; rather, it is an option, at their sole discretion. Only those prequalified for alternative bridge submittal will be allowed to submit an alternative bridge bid.

Bidders are hereby notified that CDOT will consider all submitted bids for the default bridge and for the alternative bridge together, and that CDOT will award to the low responsible and responsive bidder regardless of the particular type of bridge structure (default or alternative) bid by that bidder.

An alternative bridge submitted by a bidder must be equivalent to the default bridge. To be considered “equivalent”, the alternative bridge:

- (1) Must comply with all design and construction requirements of this Special Provision; and provide the roadway section widths, aesthetic and safety features, live load capacity, horizontal and vertical alignment, lateral clearances and minimum vertical clearances, as described herein and as shown on the Plans for the default design; and
- (2) Must include all work and materials to design and construct foundations, piers, abutments, and superstructure with all appurtenances, as described herein and as shown on the Plans for the default bridge.

Bids for an alternative bridge structure must strictly comply with all terms and conditions of this Special Provision, in order to be considered “responsive” and eligible for award.

To assist bidders desiring to submit a bid for the alternative bridge design, a CD is available from the Engineer which contains the existing and proposed design base files; the horizontal design clearance envelopes; architectural rendering(s) of the default bridge; and the default bridge design horizontal alignment and substructure locations.

DESIGN

631.02 General. CDOT has not provided design(s) for the alternative bridge(s). Therefore, if a bidder elects to submit a bid for the alternative bridge structure, the bid must include both the cost of design and construction of the alternative bridge, and that bidder must provide a complete design for the alternative bridge (“alternative design”).

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The alternative design must be accomplished under the direct supervision and responsible charge of a Professional Engineer registered in the State of Colorado; and who is hereafter referred to as the Contractor's Professional Engineer.

631.03 Minimum Qualifications for the Contractor's Professional Engineer. The Contractor's Professional Engineer shall have minimum qualifications as follows:

- (1) The Contractor's Professional Engineer shall have been in responsible charge of the design of the type of alternative structure being proposed, and shall provide to CDOT examples and references for a minimum of (2) two projects successfully completed by the Contractor's Professional Engineer(s) which are similar in nature, and which include the type of structure being proposed for the alternative bridge, as reference.
- (2) The Contractor's Professional Engineer may be a professional engineer employed by the Contractor, or a consulting engineer under contract to the Contractor. If the Contractor's Professional Engineer is not an employee of the Contractor, then the Contractor's Professional Engineer shall be employed by a firm which is pre-qualified by the CDOT for bridge design. The Contractor may utilize more than one person or firm to provide these services.
- (3) The Contractor's Professional Engineer, or his employer, shall have Professional Liability insurance in an amount not less than \$1,000,000; and provide to the Engineer an insurance certificate attesting to this coverage at the time of the Preliminary Design Submittal

631.04 Alternative Design.

- (1) *Initial Design Submittal.* Contractors who elect to submit a bid for the alternative bridge shall provide an Initial Design Submittal which consists of a minimum of three (3) 11"x17" plan sheets illustrating to the Department the structure type, typical superstructure section, elevation and section of the typical pier, pier locations and span arrangement of the proposed alternative bridge design. The Initial Design Submittal shall be submitted to the Award Officer in a sealed envelope addressed to the Engineer, along with the Contractor's bid proposal.
- (2) *Preliminary Design Submittal.* If a bidder, who elects to submit a bid for the alternative bridge, is the apparent low responsible bidder, that bidder shall provide to CDOT a preliminary alternative design and associated documents to the Award Officer for preliminary review and acceptance by CDOT within 12 calendar days of bid opening. At a minimum, this preliminary submittal shall include:
 1. Preliminary design calculations, demonstrating the conformance of the alternative design with these specifications.
 2. Preliminary design and construction schedule.

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3. Preliminary drawings. At a minimum, the preliminary drawings shall include a general layout and elevation for the entire structure(s); typical superstructure sections; pier geometry, shape, locations and type; and erection scheme. The drawings shall be consistent with the plan format shown for the default bridge. Architectural rendering(s), in 11"x17" format, shall be submitted along with the design drawings demonstrating that the aesthetic intent of the default design will be met by the alternative bridge design. Specific views shall include at a minimum: Looking North from the SouthWest area of the project by the river as was developed for the default bridge design. (Rendering(s) of the default bridge design will be included on the CD available from the Engineer, and will also available on the project web site.)

Two hard copies of reproducible drawings shall be submitted

4. Resume and qualifications of the Contractor's Professional Engineer who will be responsible for the design of the alternative bridge, along with required insurance certificate(s).
- (3) *Compensation for Preliminary Design.* Bidders will not be compensated by CDOT for any design required to prepare a bid that includes an alternate design. 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 and that design work will not be reimbursed by CDOT.
- (4) *Preliminary Design Approval.* CDOT will notify the contractor of the approval or rejection of the preliminary design within 20 calendar days of bid opening. If CDOT requests additional information regarding the alternative bridge and/or the alternative design, the approval time period, may be extended at the discretion of CDOT.

Any delay in the bidder's submittal shall not extend the contract time.

- (5) *Design Criteria.* The Contractor shall ensure that the alternative design meets all applicable design criteria for strength and serviceability, as described herein and as defined by the Contract Documents. The Contractor shall use the Plans for the default design, the Design Requirements in subsection 631.08, and the Design References and Guidelines in subsection 631.09, for the design criteria.
- (6) *Alternative Designs Predicated on Errors & Omissions.* Alternative 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 the Engineer immediately. Failure to notify the Engineer will constitute a waiver of all claims for misunderstandings, ambiguities, or other situations resulting from error, omission, or discrepancy.

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- (7) *Resulting Changes to Other Project Elements.* Any changes or impacts to other project elements as a result of the alternative design, such as, but not limited to: roadway, drainage, utilities, environmental clearances and permits, phasing, and traffic control, shall be the responsibility of the Contractor; and the cost of such changes or impacts shall be included in the alternative design cost.
- (8) *Experimental Design Concepts.* Experimental or demonstration-type design concepts, products, structures, or elements that have not been pre-approved by CDOT, in writing, for general use shall obtain CDOT's approval prior to use in the alternative design.
- (9) *Claims for Design Errors.* Claims by the Contractor for design errors made by the Contractor's Professional Engineer will not be allowed for any portion of alternative design.
- (10) *Independent Final Design Check.* The alternative design shall include an independent design check, as required by the CDOT Bridge Design Manual, by a professional engineer registered in the State of Colorado.

631.05 Alternative Bridge Plans (Final).

- (1) *Plan Format.* The Contractor shall submit complete original hardcopy plans in 11"x17" format, along with electronic files for the alternative design entirely in either MicroStation format; as well as in Adobe Acrobat (PDF) format; and the Contractor shall make any changes in the same media.
- (2) *Structure Number.* An alternative bridge design structure shall be identified by the same structure number as the default bridge.
- (3) *Contractor Signature.* Alternative bridge design drawings shall include the Contractor's signature in ink, the date signed, a business name, business address, and the note: "These drawings (Bxxx-Byyy) which supersede drawings (Bwww-Bzzz) were approved (insert date) in the title block.
- (4) *Contractor's Professional Engineer Endorsement.* The record plans for the alternative bridge design drawings shall bear the seal, signature and date of the Contractor's Professional Engineer.

631.06 Submittals.

- (1) *Final Plans, Quantity/Cost Breakdown & Field Package.* The Contractor shall submit the final plans, the itemized quantity and cost break down, and the bridge field package, to the Engineer in accordance with the preliminary design and construction schedule. Final bridge geometry, including project coordinates and dead load deflections, shall be included in the bridge field package.

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- (2) *Calculations.* The final package for submittal shall include complete design calculations, quantity calculations, design and quantity check calculations, and the bridge rating. The bridge rating shall be done using the Virtis Bridge Load Rating software (AASHTOWare), Version 5.4.0. All calculation (design, quantities, and check calculation) shall be submitted on CD in Adobe Acrobat (PDF) format.
- (3) *Record Plan Set.* For each portion of the alternative bridge, the Contractor shall submit two record plan sets in 8½" x 14" format; two hardcopy plan sets and shop drawings in 11" x 17", with complete design notes and computations to the Engineer one week prior to starting construction of that portion of the alternative bridge. The design notes and computations shall document the conclusions reached during the development of the construction plans. The plans and design computations will be reviewed by CDOT for completeness and to assure conformance with the Contract Document requirements only. All designs, plans, specifications and details of the alternative design plans, as well as the completeness and accuracy of those plans, are the Contractor's sole responsibility. Designs and computations that are not in compliance with Design Requirements, in Section 631.08 below, shall be corrected by the Contractor and resubmitted. The record 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 Contractor's Professional Engineer who was in responsible charge of the design and preparation of the plans.

631.07 Design Computations.

- (1) *Design Computation Set.* The complete set of design computations for the alternative bridge design shall include both substructure and superstructure and all appurtenances required.
- (2) *Contractor's Professional Engineer Endorsement.* The first sheet of the design computations shall contain the endorsement seal and signature of the Contractor's Professional Engineer registered in the State of Colorado.
- (3) *Discrepancies Between Design and Design Check Computations.* Discrepancies between the design and the design check shall be resolved by the Contractor and all corrections shall be reflected in the design computations.

In the event of a conflict or difference in interpretation of the design criteria, standards, or specifications that cannot be resolved, the decision of the Engineer shall be final.

- (4) *Structure Rating.* The structure shall be rated in accordance with the CDOT Bridge Rating Manual and subsection 3.2 of the CDOT Bridge Design Manual.

631.08 Design Requirements.

- (1) *General.* The Contract Documents and the Standard Specifications along with Project Special Provisions, as applicable, shall apply to the design and construction of the alternative bridge.

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- (2) *Live Load.* The structure shall be designed for an HL-93 live load, with permit vehicle combinations as specified by the Contract Documents; and the design shall conform to all AASHTO requirements as amended by the CDOT Bridge Design Manual.
- (3) *Foundations.* The foundation design shall be consistent with the recommendations provided by the geotechnical reports and recommendations completed for the project as shown in Section 631.09. In lieu of those recommendations, the Contractor may provide a foundation analysis by an independent geotechnical consultant. Costs for independent foundation analysis shall be borne by the Contractor. Piling will not be allowed for this project.
- (4) *Minimum Design Requirements.* The alternative bridge design shall, at a minimum, comply with the following design requirements and criteria:
 1. Maintain aesthetic intent of the bridge for the motoring public and pedestrians on top of the bridge. The aesthetics for the superstructure and piers should be considered to fit within the environment and be aesthetically pleasing but do not need to match the intent of the default bridge. The theme for the bridge should match one of the following as presented in the design charette for the bridge: Natural, contemporary, and historic to Pueblo.
 2. Stepped piers will not be allowed. The depth of the girders on each side of a pier shall be the same. Girders shall be continuous from Abutment 1 to Abutment 6. Superstructure depth may vary along length of bridge, but any transitions between one section to another shall be curvilinear and similar in type to superstructure depth transitions of the default design.
 3. Use a consistent material type, either steel or concrete, for the all the spans. A mixture of precast and cast-in-place concrete is allowable.
 4. Horizontal and vertical alignment, and cross slope of the roadway surface finished grade shall be the same as the default bridge. Minor adjustments may be considered to accommodate the new bridge type assuming that the changes meet all the other requirements included in this special provision including no additional ROW with the same or flatter slopes and the changes in alignment are not more than 3' from the original profile. Any earthwork calculations or other re-engineering will be the sole responsibility of the Contractor's engineer at no additional cost to the project.
 5. The superstructure exterior face and edge of deck shall be curvilinear with respect to the horizontal and vertical alignment of the roadway. Use of chorded / straight sections within a curved alignment section will not be allowed. The number of box girders shall remain constant for the entire length of bridge

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6. The superstructure shall use girders that are box shaped with sloping exterior web of outermost girder. The use of multiple I-shaped girders, steel or concrete, will not be allowed. The slope of the exterior web is defined as either of the following: 1) y distance along a line perpendicular to bottom flange, to x distance along a line parallel to bottom flange. Bottom flange is parallel to cross-slope of deck; or 2) y vertical to x horizontal for a horizontal bottom flange. The web slope shall be constant for the entire length of bridge. If box girders are constant depth, sloping webs are required at the exterior web of the outermost box for both NB and SB structures. If girders are constant depth the slope of exterior web shall be 4:1. If girders are haunched, all webs of all boxes shall be sloped at minimum 6:1. The bottom flange of constant depth girders shall be constant width and the same width for all girders. All haunched girders shall be the same.
7. For concrete superstructures, well distributed, bonded continuous crack control reinforcement shall be provided at all sections / locations.
8. The number of spans shall remain the same as the default design.
9. The abutment locations and geometric configuration shall remain the same as the default design.
10. The architectural elements of the bridge piers shall be pleasing and blend with the bridge design. The general piers location (plus or minus approximately 1') shall be maintained. Changes in pier location shall still meet all other project requirements. Changes affecting utilities shall be subject to the review and approval by the utility owner.
11. The use of a multi-column pier supporting a continuous pier cap beam will not be allowed.
12. If large diameter drilled caissons are to be utilized for the substructure of the alternative design, as was proposed for the default design, all work shall be in accordance with the project special provisions, Revision of Section 503, Drilled Caissons.
13. Alternate bridge must meet environmental conditions in compliance with the non-programmatic 4(f) approval (available for review). No affect on the railroad lines (temporary or permanent). No affect on levee or river according to environmental document. Final determination will be by CDOT with input from FHWA.

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14. Upon completion of construction, the horizontal and vertical clearances as provided in the default design shall be maintained and meet UP and BNSF railroad requirements. Plans (30%, 60%, 90% and 100%) for the alternate bridge will need to be reviewed and approved by Union Pacific and BNSF railroads.
15. Changes in pier shape or type will need to meet BNSF and UP railroad requirements such as crash worthiness as well as any scour or drainage requirements.
16. Construction clearance envelopes for local streets below the bridge and for the railroad, as shown on the plans, shall be maintained.
17. The alternative design shall have approach slabs consistent with that of the default design.
18. The bridge deck and approach slabs shall have a 3-inch HMA overlay with a waterproofing membrane, as required and provided by the default design.
19. In accordance with the CDOT Bridge Design Manual, inspection and maintenance access shall be provided for the alternative bridge.
20. Provide for and accommodate all roadway lighting design elements, conduit and attachments for the alternative bridge as shown or specified in the Contract Documents for the default design. Lighting items which were paid for separately from that shown for the default bridge will likewise be paid for separately for the alternative bridge.
21. Provide deck drains for the alternative bridge at the general locations, and of the same or greater hydraulic capacity, as shown on the Plans for the default design. Drainage details, routing of the drain piping, and aesthetic considerations shall be the same as the default design. Any change of the bridge drainage system necessary for the alternative design shall be analyzed and designed by a Professional Engineer licensed in the state of Colorado, at no cost to the project.
22. Earthquake restraints or pintels for the alternative bridge shall be provided in accordance with the AASHTO specifications.
23. Bearings, expansion devices, bridge rail and fence screening of the alternative bridge shall be in accordance with the Contract Documents for the default design, and CDOT Staff Bridge Design Manual and Staff Bridge Design Worksheets.
24. Lightweight concrete shall not be used for any portion of the alternative bridge.

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25. The color scheme proposed for the alternate bridge would need to be approved by CDOT and be shown to meet the design charrette themes.
26. Overlooks at Pier 2 will need to meet the minimum dimensions shown in the default bridge design (3.3' wide and 17.5' long) but could be larger.
27. The minimum deck overhangs, from outside edge of pedestrian rail parapet to outside face of web at the top of bottom flange, at the section required at midspan, shall be at least 8 ft and shall be constant for the entire length of bridge. The maximum differential dead load deflection of the deck cantilever outside edge, due differential rotations, between adjacent local undulations along the edge of deck, shall be controlled, to 0.07 for C/360. C is defined as the length of cantilever, in ft, from outside edge of deck to web at top flange. The definition of the differential dead load deflection is from the top of deck along a reference line from exterior web at deck to top edge of deck at edge that is at the cross-slope of the deck. Depending on deck overhang length it may be allowed to support the screed machine off of the exterior girder web, and allowed to finish the deck in the overhang area by hand.
28. The pedestrian rail parapet shall completely cover the edge of a cast-in-place deck cantilever. Precast stay-in-place deck forms are allowed at the cantilever. The concrete parapet for the pedestrian rail shall also completely hide the outside edge of stay-in-place forms and deck topping, be connected to the precast stay-in-place deck forms, and the rail parapet shall provide resistance against differential deflection of the adjacent stay-in-place panels under live loads. The parapet shall be placed after the deck is completed in one pour. If the parapet hangs down below the cantilever bottom deck sufficiently to hide the undulating edge of deck caused by differential dead load deflections, then the differential deflection requirement in 27. may be waived.
29. CDOT may allow full-depth precast panels depending on the details. If full-depth precast panels are used details shall be incorporated into the design of the full-depth panels consistent with and similar to details used on the previous CDOT projects. The contractor shall submit details for approval by CDOT at the design pre-qualification.
30. The pier near the River needs to meet all FEMA and scour requirements. All appropriate agency approvals will be required.

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631.09 Design References and Guidelines. The following references and guidelines shall be applicable to the design and construction of an alternative bridge:

- (1) CDOT Standard Specification for Road and Bridge Construction (2005)
- (2) CDOT Project Special Provisions
- (3) American Association of State Highway and Transportation Officials (AASHTO) LRFD Bridge Design Specifications, Fourth Edition, 2007
- (4) Colorado Department of Transportation M & S Standards (2000)
- (5) Colorado Department of Transportation Bridge Design Manual (1992)
- (6) Colorado Department of Transportation Bridge Rating Manual (1995)
- (7) CDOT Staff Bridge Design Worksheets
- (8) CDOT Bridge Manual Vol. II Detailing and Checking Chapter 3
- (9) ANSI/AASHTO/AWS Bridge Welding Code D1.5-2002
- (10) AASHTO Guide Specification for Design and Construction of Segmental Concrete Bridges
- (11) AASHTO Guide Specification for Horizontally Curved Highway Bridges
- (12) Colorado Department of Transportation (CDOT) Field Materials Manual
- (13) CDOT Survey Manual
- (14) CDOT Cost Estimates Item Book
- (15) CDOT Cost Estimates Cost Data (Current Edition)
- (16) CDOT Procedural Directive 508.1 Professional Engineer's Stamp
- (17) 13141 - Contract plans and specifications
- (18) 4th Street Geotechnical Engineering Study
- (19) Non-programmic Final 4(f) Evaluation
- (20) Drainage and scour analysis

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- (21) Structure selection report 2003
- (22) Structure Concept report 2001.
- (23) Design Charette voting summary and Design Charette main text.
- (24) Floodplain and Drainage Assessment Report (Ayres), December 2001
- (25) Phase I Environmental Site Assessment for SH 96A (4th Street) Bridge Over the Arkansas River, Hazwaste Technologies Corporation, September 14, 2001

631.10 Qualifications, Requirements and Responsibilities of the Contractor's Professional Engineer.

- (1) *Qualifications.* The alternative design shall be accomplished under the direct supervision and responsible charge of a Professional Engineer registered in the State of Colorado; and who is hereafter referred to as the Contractor's Professional Engineer.

The Contractor's Professional Engineer shall meet the minimum requirements of Section 631.03.

If there is any change in the Contractor's Professional Engineer, after award of the Contract, the Contractor shall submit to the Engineer for review and acceptance the replacement personnel qualifications at least 30 calendar days prior to beginning construction or changing personnel. In no case shall the proposed personnel have less comparable experience and expertise. Construction shall not begin, or continue, until the Engineer has reviewed and accepted the proposed change in qualified personnel.

Acceptance by CDOT of the Engineer of the Contractor's Professional Engineer proposed for the project shall in no way relieve the Contractor of full responsibility for the work of all design and construction personnel and full compliance with the Contract Documents.

- (2) *Services to be Provided.* The Contractor's Professional Engineer shall be responsible for carrying out all engineering services required to design and construct the alternative bridge in accordance with this specification and the Contract Documents.

The Contractor's Professional Engineer shall be responsible for observing and monitoring the Contractor's work, as necessary, during construction of the alternative bridge to ensure conformance with the alternative bridge design and design intent; and to ensure the requirements of the Contract Documents are being met for all aspects of the work for which the Contractor's Professional Engineer is responsible.

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The Contractor's Professional Engineer shall submit working drawings for all falsework, formwork, shoring, and temporary works in accordance with the Specifications. Any review of these drawings by CDOT does not relieve the Contractor or the Contractor's Professional Engineer of responsibility for the design, installation, use, stability, and safety of the falsework, formwork, shoring, and temporary works.

After erection of falsework, formwork, shoring, and temporary works, but prior to the application of any superimposed load, the Contractor's Professional Engineer shall personally inspect the falsework, formwork, shoring, and temporary works and shall certify to the Engineer in writing that it has been constructed in accordance with the materials and details shown on the submitted drawings and calculations.

The Contractor's professional engineer shall provide all services required to be performed under Revision of Section 107 Performance of Safety Critical Work and Girder Erection requirements.

- (3) *Availability.* The Contractor's Professional Engineer, and / or a designated representative, shall be available for on-site activities as needed to ensure proper implementation of the work.

The Contractor's Professional Engineer, and / or a designated representative, shall attend weekly construction progress meetings during construction of the alternative bridge.

The Contractor's Professional Engineer, or a designated representative, shall be available on a one-hour notice to discuss occurrences by telephone with the Contractor on any day during construction of the alternate bridge.

The Contractor's Professional Engineer, or a designated representative shall be available on-site and/or by telephone as deemed necessary by the Engineer.

- (4) *Authority.* The Contractor shall authorize the Contractor's Professional Engineer to stop or suspend construction operations and / or work for which the Contractor's Professional Engineer is responsible, if in the opinion of the Contractor's Professional Engineer, the alternative bridge is not being constructed in conformance with the alternative design or the Contract Documents. The Engineer shall be notified in writing by the Contractor of any work stoppage or suspension authorized by the Contractor's Professional Engineer. Such work shall not re-commence until the Contractor's Professional Engineer agrees and certifies in writing that the work deficiency has been remedied / corrected.

MATERIALS

631.19 General. All materials used in the construction of an alternative bridge structure must meet the requirements of the applicable sections of the Standard Specifications along with approved Project Special Provisions. Materials that do not meet these requirements are subject to rejection or price adjustment.

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CONSTRUCTION

631.20 General, Survey and Traffic Control.

- a) *General.* Construction of the alternative bridge shall strictly conform to the applicable sections of the Standard specifications.
- b) *Surveying.* Construction survey for the alternative bridge shall be in accordance with Section 625, as revised for this project.
- c) *Traffic Control.* Traffic control for the alternative bridge shall conform to the Traffic Control Plan included in the Contract.

631.21 Engineer's Certification. The Contractor's Professional Engineer shall provide a letter certifying that the alternative bridge structure was constructed in accordance with the Contract Documents, and that it meets all requirements of the design.

The presence of the Contractor's Professional Engineer, or his designated staff, on the project shall in no way act to relieve the Contractor of the full responsibility for: conformance of the work to the requirements of the contract documents; the structural adequacy of the erection scheme he chooses; or the safety of workers or the general public.

631.22 Record Documents. The Contractor shall provide copies of the as-constructed plans, shop drawings, and working drawings for the alternative bridge for informational purposes and for future maintenance. The as-constructed plans shall include complete original hardcopy plans in 11" x 17" format, along with electronic files in MicroStation format; as well as in Adobe Acrobat (PDF) format. All linked and referenced files shall be included.

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METHOD OF MEASUREMENT

631.23 The alternative bridge design and construction will not be measured, but will be paid for on a lump sum basis, which basis will include all work and materials required to design and construct an alternative bridge.

The work will include, without limitation: design calculations and documentation, the independent design and detail check, bridge rating, preparation of plans, details, and drawings as required to fabricate and construct the alternative bridge, including, but not limited to, construction of the superstructure, foundations, abutments, railings and appurtenances; and the record documents (as-constructed plans, shop drawings, and working drawings). All discrepancies in quantities for the alternative bridge design will be the Contractor's sole responsibility and will not be adjusted.

The completed structure shall include, as applicable but not limited to, the following items, which will not be measured separately, but will be included in the bid price for Item 631, Alternative Bridge Design and Construction:

Structure Excavation, Structure Backfill, Mechanical Reinforcement of Soil, HMA, Drilled Caissons, Bearing Devices, Bridge Drains, Waterproofing (Membrane), Bridge Expansion Devices, Structural Concrete, Structural Steel, Temporary Supports, Shoring, Structural Concrete Stain (if included in the default design), Reinforcing Steel, Reinforcing Steel (Epoxy Coated), Bridge Rail Type 7 (Special), Electrical Conduit, Lighting, Fence Chain Link (Special), Pedestrian Rail (Special), Prestressing Steel Wire or Strand, Prestressing Steel Bar and all other work and materials necessary to complete the structure.

By submitting a bid for Alternative Bridge Design and Construction, the Contractor agrees to accept the amount of that bid, as a lump sum basis, for the complete and satisfactory performance of the work.

BASIS OF PAYMENT

631.24 The accepted quantities for construction of the alternative bridge will be paid for at the contract lump sum bid as follows:

Payment will be made under:

Pay Item

Alternative Bridge Design & Construction

Pay Unit

Lump Sum

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631.25 Lump Sum Basis.

The lump sum bid price shall be full compensation for the cost of all the work, materials, tools, equipment, and incidentals required to complete the design and construction of the alternative bridge.

The work shall include design, independent design check, bridge rating, and plan preparation for the alternative bridge.

Supplemental survey and foundation investigation work required by the Contractor for the alternative bridge shall also be included in the work.

The Contractor's construction oversight shall be included in the work.

Any design or construction costs resulting from changes or impacts to other project elements as a result of the alternative bridge design and construction, which were not required by the default bridge, such as, but not limited to: roadway, drainage, utilities, environmental clearances and permits, phasing, and traffic control, shall be the sole responsibility of the Contractor; and the cost of such changes or impacts shall be included in the alternative bridge lump sum cost.

The Engineer will determine partial payment for the construction of the alternative bridge and include the partial payment for each pay estimate.

Partial Payment and Price Reduction: The Contractor shall furnish an itemized quantity and cost break down of the Lump Sum bid to the Engineer prior to commencement of construction. The Contractor's itemized quantity and cost break down shall reference the CDOT item numbers as provided in the CDOT Item Code Book.

The Engineer will review the Contractor's itemized quantity and cost break down to determine its trueness and reasonableness by using CDOT cost estimate data. The Contractor's approved itemized quantity and cost break down shall be used as a basis for calculating partial payments and price adjustments for materials that do not meet specifications.

No cost adjustment to the bid price will be made for differences between the contractor's preliminary estimated quantities and final quantities.