Project No. BRO M065-006 **January 2, 2017**
PCN 18888

COLORADO DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISIONS
BAYFIELD LOS PINOS RIVER TWIN BRIDGES

The 2011 Standard Specifications for Road and Bridge Construction controls construction of this project. The following special provisions supplement or modify the Standard Specifications and take precedence over the Standard Specifications and plans.

PROJECT SPECIAL PROVISIONS

COLORADO DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISIONS
BAYFIELD LOS PINOS RIVER TWIN BRIDGES

STANDARD SPECIAL PROVISIONS

Name	Date	No. of Pages
Revision of Sections 101, 508, 614, and 710 – Treated Timber	(July 31, 2014)	1
Revision of Section 101 and 630 – Construction Zone Traffic Control	(April 30, 2015)	2
Revision of Section 103 – Escrow of Proposal Documentation	(May 5, 2011)	2
Revision of Section 105 – Construction Drawings	(July 29, 2011)	1
Revision of Section 105 – Construction Surveying	(July 31, 2014)	1
Revision of Section 105 – Violation of Working Time Limitation	(February 3, 2011)	1
Revision of Sections 105 and 106 – Conformity to the Contract of Hot Mix Asphalt (Less than 5000 Tons)	(January 15, 2015)	8
Revision of Section 106 – Buy America Requirements	(November 6, 2014)	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 – Supplier List	(January 30, 2014)	1
Revision of Sections 106, 627 and 713 - Glass Beads for Pavement Marking	(May 12, 2016)	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 107 – Warning Lights for Work Vehicles and Equipment	(January 30, 2014)	1
Revision of Section 107 – Water Quality Control (Contractor Obtained Stormwater Permit)	(March 29, 2016)	6
Revision of Section 108 – Delay and Extension of Contract Time	(April 30, 2015)	2
Revision of Section 108 – Holiday Weekend	(February 18, 2016)	1
Revision of Section 108 – Liquidated Damages	(October 29, 2015)	1
Revision of Section 108 – Notice to Proceed	(July 31, 2014)	1
Revision of Section 108 – Project Schedule	(July 31, 2014)	6
Revision of Section 108 – Subletting of Contract	(January 31, 2013)	1
Revision of Section 109 – Asphalt Cement Cost Adjustment (Asphalt Cement Included in the Work)	(August 3, 2015)	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 – Measurement of Water	(January 06, 2012)	1
Revision of Section 109 – Prompt Payment	(January 31, 2013)	1
Revision of Section 109 – Scales	(October 29, 2015)	1
Revision of Section 201 – Clearing and Grubbing	(November 10, 2016)	1
Revision of Sections 202, 627 and 708 - Pavement Marking Paint	(May 12, 2016)	4
Revision of Section 203 – Excavation and Embankment	(November 10, 2016)	11
Revision of Section 206 – Imported Material for Structure Backfill	(July 19, 2012)	2

COLORADO DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISIONS
BAYFIELD LOS PINOS RIVER TWIN BRIDGES

STANDARD SPECIAL PROVISIONS

Revision of Section 206 – Structure Backfill (Flow-Fill)	(April 26, 2012)	2
Revision of Section 206 – Structure Backfill at Bridge Abutments	(January 30, 2014)	1
Revision of Sections 206, 304, and 613 – Compaction	(November 10, 2016)	1
Revision of Sections 206 and 601 – Maturity Meters and Concrete Form and Falsework Removal	(December 18, 2015)	3
Revision of Section 208 – Erosion Control	(September 22, 2016)	23
Revision of Section 212 – Seed	(April 26, 2012)	1
Revision of Section 213 – Mulching	(January 31, 2013)	4
Revision of Section 216 – Soil Retention Covering	(July 16, 2015)	6
Revision of Section 250 – Environmental, Health and Safety Management	(January 15, 2015)	14
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 – Plant Mix Pavements	(February 3, 2011)	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 507 – Grouted Riprap Slope and Ditch Paving	(November 6, 2014)	1
Revision of Section 512 – Bearing Device Testing	(November 6, 2014)	1
Revision of Section 601 – Class B, BZ, D, DT, and P Concrete	(February 18, 2016)	2
Revision of Section 601 – Concrete Batching	(February 3, 2011)	1
Revision of Section 601 – Concrete Finishing	(February 3, 2011)	1
Revision of Section 601 – Concrete Slump Acceptance	(October 29, 2015)	1
Revision of Section 601 – Depositing Concrete Under Water	(May 2, 2013)	1
Revision of Section 601 – QC Testing Requirements for Structural Concrete	(May 8, 2014)	1
Revision of Section 601 – Structural Concrete Strength Acceptance	(April 30, 2015)	1
Revision of Sections 601 and 701 – Cements and Pozzolans	(November 6, 2014)	4
Revision of Section 603 – Culvert Pipe Inspection	(October 2, 2014)	1
Revision of Sections 603, 624, 705, 707, and 712 – Drainage Pipe	(April 30, 2015)	3
Revision of Section 612 – Delineators	(February 3, 2011)	1
Revision of Sections 614 and 713– Sign Panel Sheeting	(August 11, 2016)	2
Revision of Section 618 – Prestressed Concrete	(April 26, 2012)	24
Revision of Section 630 – Retroreflective Sign Sheeting	(May 8, 2014)	1
Revision of Section 702 – Bituminous Materials	(March 29, 2016)	11
Revision of Section 703 - Aggregate for Bases (Without RAP)	(October 31, 2013)	1
Revision of Section 703 – Aggregate for Hot Mix Asphalt	(November 1, 2012)	2
Revision of Section 703 – Classification for Aggregate Base Course	(October 20, 2016)	1
Revision of Section 703 – Concrete Aggregate	(July 28, 2011)	1
Revision of Section 709 – Epoxy Coated Reinforcing Bars	(February 18, 2016)	1

COLORADO DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISIONS
BAYFIELD LOS PINOS RIVER TWIN BRIDGES

STANDARD SPECIAL PROVISIONS

NOTICE TO BIDDERS

The proposal guaranty shall be a certified check, cashier's check, or bid bond in the amount of 5 percent of the Contractor's total bid.

Pursuant to subsections 102.04 and 102.05, it is recommended that bidders on this project review the work site and plan details with an authorized project representative. Prospective bidders shall contact one of the following listed authorized Department representatives at least 12 hours in advance of the time they wish to go over the project.

City Manager – Chris Lamay	Office Phone:	(970) 884-9544
Supervisory Engineer - Rich Bechtolt	Office Phone:	(970) 259-7534
Project Engineer – Mike Coggins	Office Phone:	(970) 259-7534

The above referenced individuals are the only representatives of the Project with authority to provide any information, clarification, or interpretation regarding the plans, specifications, and any other contract documents or requirements.

A mandatory pre bid conference will be held on January 24, 2017 beginning at 9:00 am at Bayfield Town Hall. Bids will be accepted only from pre-qualified bidders who attend the mandatory pre-bid conference.

Questions received from bidders along with the responses will sent to the email addresses of the Preconstruction attendee list.

If the bidder has a question or requests clarification that involves the bidder's innovative or proprietary means and methods, phasing, scheduling, or other aspects of construction of the project, the Project Engineer address the question or clarification. The Project Engineer will keep the bidder’s innovation confidential and will not share this information with other bidders.

The Project Engineer will determine whether questions are innovative or proprietary in nature. If the Project Engineer determines that a question does not warrant confidentiality, the bidder may withdraw the question. If the bidder withdraws the question, the Project Engineer will not answer the question and the question will not be emailed out to the attendees. If the bidder does not withdraw the question, the question will be answered, and both the question and Project Engineer answer will be sent out to the attendee list. If the Project Engineer agrees that a question warrants confidentiality, the Project Engineer will answer the question, and keep both question and answer confidential. The Project Engineer will keep a record of both question and answer in their confidential file.

All questions shall be directed to the contacts listed above no later than 7:00 A.M. Monday of the week of bid opening. Final questions and answers will be posted no later than Tuesday morning of bid opening week.

Questions and answers shall be used for reference only and shall not be considered part of the Contract.

COMMENCEMENT AND COMPLETION OF WORK (FLOATING START DATE)

The Contractor shall select the date that contract time begins for this project, subject to the following conditions:

(a) The earliest date shall be March 6, 2017

(b) The latest date shall be March 20, 2017

(c) The Contractor shall notify the Engineer, in writing, at least 30 days before the proposed beginning date. If the earlier date, as stated above, follows the award date by less than 30 days, the Contractor's written notice to the Engineer shall be at least l0 days before the proposed beginning date.

(d) The date that contract time begins shall be March 20, 2017

The Contractor shall complete all work within 220 working days in accordance with the "Notice to Proceed."

If materials stockpiling begins before the beginning date, contract time will not be charged for the stockpiling effort. 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 l09 and 626.

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

Subsection 108.03 shall include the following:

Salient features for this project are:

(1) Clearing and Grubbing
(2) Construction Traffic Control Bridge Closure
(3) Offsite Mitigation Creation
(4) Construction Surveying
(5) Topsoil, seeding and mulching
(6) Erosion Control
(7) Temporary Sewer Bypass
(8) Bridge demolition
(9) Caisson Installation
(10) Abutment Piers
(11) MSE Panel Wall
(12) Girder Placement
(13) Deck Pour
(14) Final Sewer Line alignment
(15) Asphalt Paving
(16) Final Signing
(17) Bridge Rail
(18) Guardrail
(19) Approach Slabs
(20) Roadway Demolition
(21) Earthwork
(22) Riprap
(23) Shared Use Path

-2-

COMMENCEMENT AND COMPLETION OF WORK
(FLOATING START DATE)

Subsection 108.05 shall include the following:

The Contractor shall complete the following discrete portions of the work (milestones) by the dates specified. A disincentive will be assessed for failure to complete the work for each milestone by the specified completion date.

Milestone No. 1
Description: **Clearing and Grubbing**
Clearing and grubbing shall commence no later than March 27, 2017. Clearing and grubbing shall not commence until clearing limits are staked, erosion control devices are installed, and utilities have been located. See environmental notes for additional information.
Completion Date: Clearing and grubbing shall be completed to the greatest extent practical prior to April 1, 2017.
Disincentive: $5,000 Lump Sum for failure to clear and grub areas near structures prior to April 1, 2017.

Milestone No. 2
Description: **Shared Use Path and Sidewalk in Joe Stephenson Park**
The limits of this requirements generally this includes the work between Mill St. and the east end of the skate park at Station 311+00.
Completion Date: The work within Joe Stephenson Park will be completed within 30 consecutive working days of the start of the work in the park to minimize the closure of the park for its intended use. Also of note for the contractor is a requirement that only one half of the park can have the access closed at any one time. The Contractor will also schedule the work in the park to ensure the park is open for the Fourth of July festivities.
Disincentive: $1,000 a day after 30 working days.

Milestone No. 3
Description: **Little Pine Park - Wetland Mitigation Site**
Completion Date: The work within Little Pine Park for the Wetland mitigation effort, including the Wetland Establishment area as well as the Wetland Enhancement areas will be completed within 40 consecutive working days of the start date of the work in the Little Pine Park. The wetland establishment area has the additional requirement that the mitigation effort also be completed within 7 months of the first temporary or permanent impact to the wetlands as designated on the "Permitted 404 Wetlands Impacts Sheet" in the plans. The work within the park also has other work time related restrictions and requirements as laid out in the plans. Other time and work constraints are included in the Environmental Notes. A couple of critical concern relate to the Migratory Bird Treaty Act requirements and Southwest Willow Fly Catcher Critical Habitat work restrictions.
Disincentive: $1,000 a day after 40 working days.

Milestone No. 4
Description: **Roadway and Bridges Open to Traffic**
This milestone provides incentive for the Contractor to complete the structural and roadway portions of the work prior to winter. Work to be completed includes all items necessary to safely open the road to traffic, including but not limited to: all structural work, HMA paving, ABC shoulder gravel, bridge rail, guardrail, striping, signing and delineation. Permanent sewer line shall be in operation.
Completion Date: December 22, 2017
Incentive: $40,000 Lump Sum for opening road to all traffic

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:

6 Percent DBE participation.

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 640 hours

REVISION OF SECTION 101
DEFINITIONS AND TERMS

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

Certain terms utilized in the Specifications referred to in the paragraph above shall be interpreted to have different meanings within the scope of the Contract. A summary of redefinitions follows:

Subsection 101.10 CDOT Resident Engineer shall be defined as the Town Of Bayfield owner's representative that is in responsible charge of the Project.

Subsection 101.28 Department shall be replaced with the Town of Bayfield.

Subsection 101.29 Engineer shall be defined as Town Of Bayfield's Owner's representative, who is responsible for engineering and administrative supervision of the project. The terms Engineer (101.29), Project Engineer (101.51), Chief Engineer and Project Manager shall be interchangeable in this contract.

Subsection 101.39 Laboratory shall be defined as the testing laboratory as designated by the Town of Bayfield.

Subsection 101.58 Region Transportation Director shall be defined as the Town of Bayfield Public Works director.

Subsection 101.76 State shall mean Town of Bayfield, Colorado (where applicable).

In addition, the following definitions shall be added:

Subsection 101.96: Colorado Department of Transportation (CDOT) shall be defined as the Town Of Bayfield.

Subsection 101.97 State of Colorado – When used in terms of the contract authority, shall be defined as the Town of Bayfield.

REVISION OF SECTION 102
PROJECT PLANS AND OTHER DATA

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

Subsection 102.05 shall include the following:

The following information will be available for review at the Bayfield Town Hall located at 1199 Bayfield Parkway or electronically upon request:

- Waters of the US Mitigation and Monitoring Plan for Town of Bayfield Twin Bridges Replacement and Shared Use Path Projects, DA #SPK-200375071
- Geotechnical report
- Asbestos and Lead Paint testing reports
- 'As-Built' Bridge Plans for existing structures
- Town of Bayfield Construction Specifications
- Town of Bayfield Infrastructure Design Standards
- Town of Bayfield Sewage System information
- General and Specific Conditions for Senate Bill 40 Wildlife Certification
- Wetland Finding, Additional Environmental Conservation Measures

The following information will be available for review from Bechtolt Engineering upon request:

- Roadway Cross section sheets

The Town of Bayfield will provide an area where contractors can review any available documents related to the project.

After the proposals have been opened, the low responsible bidder may obtain from the Town of Bayfield, at no cost: 15 sets of plans and special provisions; and if available for the project, one set of full-size cross sections, one set of full-size major structure plan sheets, and one set of computer output data. PDFs of the documents will be available to the contractor and Subcontractors upon request.

REVISION OF SECTION 105
HMA ROADWAY SMOOTHNESS

Section 105 of the Standard Specifications are hereby revised for this project as follows:

Delete subsection 105.07 and replace with the following:

105.07 Conformity to Roadway Smoothness Criteria. Roadway smoothness testing and corrective work shall be performed as described below.

1. The finished transverse and longitudinal surface elevation of the pavement shall be measured using a 10 foot straightedge. Areas to be measured shall be as directed by the Engineer. The Contractor shall furnish an approved 10 foot straightedge and depth gauge and provide an operator to aid the Engineer in testing the finished pavement surface. Areas showing high spots of more than 3/16 inch in 10 feet shall be marked and diamond ground until the high spot does not exceed 3/16 inch in 10 feet. When the Engineer suspects HMA thickness has been reduced by grinding to less than that shown in the plans coring shall be performed to determine HMA thickness. Any area of reduced thickness not meeting the requirements of the plans shall be milled the full width of the lane and paved with a 1.5" layer of HMA. Any and all costs associated with this work including traffic control and pavement marking will be paid by the contractor.

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.

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
(2) Overhead structure construction or repair
(3) Removal of bridges
(4) Temporary works: falsework, shoring that exceeds 5 feet in height, cofferdams, and temporary bridges
(5) Work requiring the use of cranes or other heavy lifting equipment to set a girder, to make overhead repairs, or includes special provisions for Removal of Bridge or Removal of Portion of Bridge. Also when construction materials are being lifted that may fall onto active traffic lanes.
(6) Existing Sanitary Sewer lines (Hazardous Materials)
(7) MSE Panel Wall Construction
(8) Installation of riprap revetment

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, a bridge removal plan, or a removal of portion of bridge 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
   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 or bridge removal 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, such as falsework, shoring etc., related to construction plans for the safety critical elements, (3) Removal of Bridge, (4) Removal of Portion of Bridge and (5) 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 signed and sealed construction details. Unless otherwise directed or approved, the Contractor's Engineer need not be on site during the actual performance of safety critical work, but shall be present to conduct inspection for written approval of the safety critical work.

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

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

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.

REVISION OF SECTION 108
LIMITATIONS OF OPERATION

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

Subsection 108.05 shall include the following:

The Contractor will not be allowed to remove both Bridges unless he is able to satisfactorily prove to the engineer that he can provide reasonable access to the Gosney Property located on the north and south side of Bayfield Parkway for the duration of the project.

If the engineer determines that the 'reasonable' access can be maintained without the bridges remaining in place, he will provide written approval to the Contractor that he is allowed to demo both bridges at the same time.

Reasonable access for this project is defined as follows. It is expected that the contractor would need access to the interior abutments on both structures over the course of construction. This access would be required to get to both bridge sites with construction workers, equipment and materials. If that access had the following characteristics, it could be considered reasonable access.

- Reasonable grade
- Traversable surface
- Access via a normal vehicle (two wheel drive)
- Access road is available to the land owner to use to get to his property

The access would likely need to cross environmentally sensitive Wetlands and that crossing would be required to be temporary in nature and those wetlands would be required to be restored to their original function. Please refer to the plan sheets, "404 Permitted Wetland Impacts" for the limits of the wetlands that can be impacted. The requirements for these temporary impacts are as follows:

> Woody riparian vegetation should be cut to near ground level, geotextile fabric laid down, and a layer of certified weed-free hay or straw laid on top. Thereafter, a layer of soil at least two feet thick will be applied on which construction equipment can move. After construction is complete, the layer of dirt will be removed until the layer of hay or straw is encountered. This layer signifies that the geotextile fabric layer is near and more careful excavation is necessary. Lastly, the layer of geotextile fabric will be removed.

The access would also need to be completely within the Town Of Bayfield's Right of Way and the project construction easement.

REVISION OF SECTION 202
REMOVAL OF BRIDGE

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

Subsection 202.01 shall include the following:

This work consists of removal of the existing bridges Bayfield -2.0 (previously known as P-06-G) and Bayfield-3.0 (previously known as P-06-H). Bridge removal shall consist of the complete removal of all superstructure and substructure elements unless otherwise shown on the plans.

Subsection 202.02 shall include the following:

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

The removal of these two bridges required coordination and permitting with state and federal agency's. The contractor must obtain a CDPHE Demolition Permit, issued by CDPHE Indoor Air Quality Unit for demolition of both structures. The permit application has been partially completed by the asbestos inspector and is available upon request from CDOT Environmental. The Contractor must complete all portions of the permit application and submit to CDPHE 10 business days prior to demolition. Compliance with the US Fish and Wildlife Service Biological Opinion, and US Army Corps Nationwide Permit 14, and the CDPHE Demolition Permit shall be required."

The Contractor shall submit a Bridge Removal Plan to the Engineer, for record purposes only, at least 10 working days prior to the proposed start of removal operations. This Plan shall detail procedures, sequences, and all features required to perform the removal in a safe and controlled manner. The Bridge Removal Plan shall be stamped "Approved for Construction" and signed by the Contractor. The Bridge Removal Plan will not be approved by the Engineer.

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

(1) The removal sequence, including staging of removal operations. Sequence of operation shall include a detailed schedule that complies with the working hour limitations.

(2) Equipment descriptions including size, number, type, capacity, and location of equipment during removal operations.

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

(4) Details, locations and types of protective coverings to be used. The protective covering shall prevent any materials, equipment or debris from falling onto the property below. When removal operations are located over or in proximity to any live waterway, railroad, or pedestrian/bicycle path, additional width of protective covering sufficient to protect these facilities shall be required. Detailed methods for protection of the existing roadway facilities, including measures to assure that people, property, utilities, and improvements will not be endangered.

(5) Detailed methods for mitigation of fugitive dust resulting from the demolition.

(6) Details for dismantling, removing, loading, and hauling steel elements.

(7) Methods of Handling Traffic, including bicycles and pedestrians, in a safe and controlled manner.

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

The Contractor's Engineer shall sign and seal (1) and (3) listed above in the final Bridge Removal Plan.

The final Bridge Removal Plan shall be stamped "Approved for Construction" and signed by the Contractor. The Contractor shall submit a final Bridge Removal Plan to the Engineer prior to bridge removal for record purposes only. The Contractor shall not begin the removal process without the Engineer's written authorization.

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

Unless otherwise directed, the Contractor's Engineer need not be on site when bridge removal operations are in progress, but shall be present to conduct daily inspection for written approval of the work. The Contractor's Engineer shall certify in writing that the falsework, bracing, and shoring conform to the details of the final Bridge Removal Plan. A copy of the certification shall be submitted to the Engineer.

The Contractor's Engineer shall inspect the bridge removal site and report in writing on a daily basis the progress of the operation and the status of the remaining structure. A copy of this daily report shall be available at the site of the work at all times, and a copy of the previous day's inspection report shall submitted to the Engineer daily.

The Contractor shall have all necessary workers, materials, and equipment at the site prior to closing any lanes to traffic to accommodate bridge removal operations. While the lanes are closed to public traffic, work shall be pursued promptly and without interruption until the roadway is reopened to traffic.

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

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

Should an unplanned event occur or the bridge removal operation deviate from the submitted bridge removal plan, the bridge removal operations shall immediately cease after performing any work necessary to ensure worksite safety. The Contractor shall submit to the Engineer, the procedure or operation proposed by the Contractor's Engineer to

correct or remedy the occurrence of this unplanned event or to revise the final Bridge Removal Plan. The Contractor shall submit his Engineer's report in writing, within 24 hours of the event, summarizing the details of the event and the procedure for correction.

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

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

(1) Final Bridge Removal Plan has not been submitted, or written authorization has not been provided by the Engineer to begin the removal.

(2) The Contractor is not proceeding in accordance with the final Bridge Removal Plan, procedures, or sequence.

(3) The Contractor's Engineer is not on site to conduct inspection for the written approval of the work.

(4) Safety precautions are deemed to be inadequate.

(5) Existing neighboring facilities are damaged as a result of bridge removal.

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

The Contractor shall notify all emergency response agencies of the proposed removal work and any detours 24 hours in advance of work. This shall include the Colorado State Patrol, local Police Department, local Fire Department, all local ambulance services, and the Sheriff's Department, as appropriate.

All required traffic control devices, night time flagging stations, barricades and VMS signs shall be in place, with detours in operation, prior to the beginning of removal operations each day. Night work shall conform to the requirements of the MUTCD, Parts 1, 5, and 6.

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

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

Removal shall include the superstructure, the substructure, which includes the piers, the abutments and wingwalls, the bridge rail, and any approach slabs and sleeper slabs.

-4-

REVISION OF SECTION 202
REMOVAL OF BRIDGE

Removal of the substructure shall be taken down to at least 1 foot below the natural existing or future ground surface at the lowest point of interface with the abutment, unless otherwise approved by the Engineer. Holes resulting from substructure removal shall be backfilled with Structure Backfill (Class 2) to the adjacent existing grades.

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

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

Subsection 202.12 shall include the following:

Payment will be made under:

Pay Item	**Unit**
Removal of Bridge	Each

Payment for Removal of Bridge will be full compensation for all labor and materials required to complete the work, including, preparation and implementation of the Bridge Removal Plan, inspection, equipment, debris handling and disposal, salvaging, handling and storage of salvable materials, handling and disposal of all hazardous materials and disposal of non-salvable materials.

REVISION OF SECTION 202
REMOVAL OF STRUCTURES COATED WITH HEAVY-METAL BASED PAINT

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

Subsection 202.01 shall include the following:

This work consists of the removal of a structure or components of a structure coated with paint which may contain lead, other heavy metals, or a combination thereof. Management of paint debris waste shall be accomplished in accordance with Section 250.

Subsection 202.12 shall include the following:

Payment for removal of structures, or portions thereof, coated with heavy-metal based paint will be full compensation for all work necessary to complete the item. Paint debris waste management and disposal will be included in the cost of the removal.

REVISION OF SECTION 203
EMBANKMENT MATERIAL

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

In subsection 203.03(a), first paragraph, after the second sentence add the following:

Embankment material shall have a Minimum R-value of at least 40 when tested by the Hveem Stabilometer.

REVISION OF SECTION 208
WATER AND SEDIMENT CONTROL

Section 208 of the Standard Specification is hereby revised for this project to include the following: The work consists of controlling groundwater, tributary stormwater in-flow, and instream flows during construction, including minimizing sediment entrainment and turbidity of stream flows originating from construction activity.

SUBMITTALS

In addition to the project Stormwater Management Plan (SWMP), the Contractor shall submit a separate water and sediment control plan. The water and sediment control plan shall include location, height, and type of construction materials and Best Management Practices (BMPs) for placement and removal of a coffer dam consistent with the constraints listed in the Commencement and Completion of Work.

PRODUCTS

Instream construction access, dams, or diversions shall be constructed with clean material (e.g., barrier, clean rock, sheet piling, plastic sheeting, or sandbags) to protect water quality. Onsite materials within the limits of construction may also be used to construct temporary dams and berms as long as appropriate sediment control is achieved and maintained. The Contractor may be required by the Engineer, at no additional cost to the Owner, to provide additional protection of water control facilities, if in the opinion of the Engineer, existing control appears inadequate or is not in conformance with the sediment or water control plan.

In no instance shall any dams, berms, dikes, or diversion channels be left unprotected.

EXECUTION

The Los Pinos River, overflow channel, and associated wetlands are Waters of the US under the jurisdiction and regulation of the US Army Corps of Engineers. If there are any impacts beyond those shown on the plans and as authorized under the project's Nationwide 404 Permit, the Project Engineer shall be contacted immediately and all work shall stop. The Contractor is responsible for the stability of all work elements, temporary and permanent, for all phases of the project, and for all flow conditions. All Contractor activities must be constructed to withstand high flows and must not restrict or impede the passage of flows.

During all phases, the Contractor must not restrict flows and must maintain a natural streambed to include features (i.e., baffles) to allow for fish passage, including passage through temporary pipe diversions. The streambed and banks shall be protected during all phases of construction and project operations and restored according to plans. The final grade of the streambed shall have a natural streambed and include features for fish passage. Cost to protect and restore the river shall not be paid for separately but shall be included in the cost of the work. Any work in the river shall follow all applicable federal and state permits, including local requirements and regulations.

GENERAL

For all excavation, the Contractor shall provide suitable equipment and labor to remove water, and shall keep the excavation properly dewatered so the pipes and concrete work can be carried on under dewatered conditions where

required by the Contract Drawings and Specifications. Water and sediment control shall be accomplished in such a way that no damage is done to the adjacent banks.

LOW FLOWS

Temporary access to the river consisting of berms is allowed as an aid to controlling water in work areas. The design, placement and safety of the temporary access are entirely the Contractor's responsibility.

All excavations made as part of dewatering operations shall be backfilled with native fill or filter bedding material and compacted to 95 percent of maximum density (AASHTO T-99).

STORM FLOWS

The Contractor shall conduct operations in such a manner that storm waters may proceed uninterrupted along their drainage courses. The Contractor shall investigate the risk arising from such waters and plan the work accordingly. Contractors operations shall not restrict any flows or cause any backwater conditions. Any damage done during storm flows to temporary, existing, completed or partially completed structures or resulting from the Contractors operation shall be repaired at the Contractors expense.

SEDIMENT CONTROL

The Contractor shall minimize sediment entrainment within the river and diversion pipes and shall minimize downstream turbidity in the river beyond the approved coffer dam and associated construction activities through the use of protected control structures or BMPs. Such protection shall be maintained throughout the duration of use during the project and consist of, but not necessarily be limited to, geotextile fabrics, riprap, and conduits.

In no instance shall construction activities or equipment be allowed to work in flowing water during recognized spawning seasons or any other time not approved by the Engineer.

HAZARDOUS MATERIALS

In no instance shall oil or other hazardous materials be allowed to enter any flowing or contained water in or adjacent to the project site or adjacent wetlands. No hazardous materials shall be stored in the river channel at any time.

MATERIAL AND EQUIPMENT STORAGE

The Contractor is responsible for all material and equipment maintenance and storage at the project site. At no time and under no circumstance shall any equipment or material be stored in the river channel or in adjacent wetlands. No equipment or material is to be stored in the river or overflow channel overnight unless approved by the Engineer. All

material not installed and all equipment other than pumps to maintain water control shall be removed the channel and stored no closer than 25 feet from the top of the banks at the end of each workday unless approved by the Engineer.

MEASUREMENT AND PAYMENT

Subsection 208.12 shall include the following:

Payment will be made under:

Pay Item	**Pay Unit**
Water Control	Lump Sum

Payment will be full compensation for all work necessary to complete the temporary access into the river and overflow channel, including all measures implemented to protect completed work, protect and restore the river bed, and minimize sediment entrainment in the river within the project limits, and minimize turbidity in the river beyond the project limits, including but not limited to temporary shoring (if required), diversion berms (earthen, sheet pile or pipes), earthwork, geotextile fabrics, riprap, dewatering wells, pumps, associated grading, revegetation, and all work associated with the river banks protection and cleanup.

REVISION OF SECTION 2l4
TRANSPLANTING LOG CUTTINGS

Section 2l4 of the Standard Specifications is hereby revised for this project to include the following:

DESCRIPTION

This work consists of transplanting existing 1.5 to 3 inch caliper cottonwood species dormant log cuttings, hereinafter referred to as log cuttings, in accordance with this specification and as directed by the Engineer.

MATERIALS

Log cuttings shall be those selected by the Contractor and approved by the Engineer from plants presently growing within the project limits. Log cuttings shall be 4 to 6 feet long and 1.5 to 3 inches in diameter with an angle cut on the root end and flat cuts on the crown end.

Log cuttings shall be taken from dormant cottonwood trees before buds appear or sap starts to rise. Wound sealant shall be applied and the color shall be varied according to the temperature in the planting area. Black sealant shall be used if early warming of the growing tip is needed, white sealant if early warming or too hot temperatures are anticipated. Log cuttings shall be stored no longer than one week.

Log cuttings shall be stored in water, flat cuts up. At least 2/3 of the total cutting length shall be covered with water. Cuttings shall be treated with Rootone F rooting hormone or an approved equal at the rate of 1 pound per 35 gallons of water.

CONSTRUCTION REQUIREMENTS

The bottom 12 to 14 inches of the root end (angle cut) shall be scored with a hand axe. Log cutting shall be placed in a prepared hole to within 6 to 8 inches of the top of the log. Voids shall be filled with soil and tamped.

METHOD OF MEASUREMENT

Transplanted log cuttings will be measured by the actual number of cuttings transplanted and accepted in their final location.

BASIS OF PAYMENT

The accepted quantities of transplanted log cuttings will be paid for at the contract unit price each. Payment will be made under:

Pay Item	**Pay Unit**
Dormant Log Cutting	Each

REVISION OF SECTION 215
TRANSPLANTING SHRUB ROOT PADS

Section 215 of the Standard Specifications is hereby deleted for this project and replaced with the following:

DESCRIPTION

2l5.0l This work consists of transplanting existing deciduous shrub root pads, hereinafter referred to as "shrubs," in accordance with these specifications and as directed by the Engineer.

MATERIALS

2l5.02 Shrubs shall be those selected by the Engineer from plants presently growing within the project limits or as directed. Multiple stemmed plants from dense thickets are most desirable.

CONSTRUCTION REQUIREMENTS

2l5.03 Planting depressions shall be prepared to receive shrubs in areas and dimensions indicated on the plans, or as directed by the Engineer, with vertical sides, approximately 12 inches deep.

Before shrubs are placed in a planting depression, the pit shall be filled 1/2 full of water and left to drain. No commercial fertilizer or tablets shall be used in planting depressions. Planting depressions shall be prepared with mechanical equipment.

Branches and foliage of shrubs to be transplanted shall be trimmed to within 24 inches of the soil surface. Branches shall be placed in moist soil at edge of stream channel as directed by the Engineer to facilitate rooting.

The shrub and root system shall be removed from the soil by scooping at a depth of 12 to 14 inches under the root pad until the quantity and dimensions needed for planting depression are removed. Shrubs shall be transplanted with a combination loader or other equipment adequate to perform the task.

Shrub pad shall be lifted and transported to planting site and carefully slid or placed into planting depression. Special care shall be taken to keep shrub root pads moist during transplanting operation.

Shrubs which cannot be transplanted within one day shall be placed in holding beds. Holding beds shall be either excavated or piled to accommodate a depth of peat moss or sawdust that exceeds the height of the root system by at least 6 inches. The holding beds shall be kept moist during the holding period and shall be shaded.

Topsoil shall be backfilled into edges of shrub pad and into all cracks developed while transplanting. Shrubs shall be thoroughly watered and additional topsoil backfilled into depressions or uneven areas. Topsoil shall be firmly tamped around planting depression and thoroughly watered a second time. All transplanted shrubs shall be kept moist for two weeks.

Payment for the transplanting shrub root pads will be included in the 207 Stockpile Wetland Topsoil pay item. This includes the removal, transportation, stockpile, planting or any other work to transplant the shrub root pads at the off-site mitigation location.

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 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.

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

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.

If birds establish a nest within the survey area, an appropriate buffer of 50 feet will be established around the nest by the CDOT 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.

(b) *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.

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.

(c) *Bald Eagle Roosting.* The wildlife biologist shall conduct a dusk and a dawn survey of Bald Eagle roosts within seven days prior to the performance of any construction during the winter season, November 15 to March 15.

(1) If no active Bald Eagle is roost is identified within 0.5 mile of the construction site during pre-construction surveys, construction may commence without restrictions pertaining to Bald Eagle activities.

If an active Bald Eagle roost is identified within 0.5 mile of the construction site during pre-construction surveys, construction activities shall be limited to operating from 10:00 AM - 2:00 PM to prevent disturbance of the roost. Additional surveys may be performed, and if roost is determined to be inactive during morning survey, construction activities may proceed immediately following completed survey and continue to 2:00 PM.

(2) If an active Bald Eagle roost is identified within 0.5 mile of the construction site during pre-construction surveys, the proponent shall re-submit the "Eagle Take-Associated with but Not the Purpose of an Activity" Permit Application to the U.S. Fish and Wildlife Service Migratory Bird Permit Office (USFWS MBPO) for approval. All conditions and stipulations of issued "Eagle Take-Associated with but Not the Purpose of an Activity" Permit shall be adhered to during construction.

(d) *Raptor Nesting.* The wildlife biologist shall conduct raptor nest surveys within 0.5 mile of the construction site prior to the start of construction and prior to each construction phase for construction performed from February 15-July 15. This survey can be done with binoculars. If construction activities are located within the Colorado Parks and Wildlife (CPW) recommended buffer zone for specific raptors, "NO WORK" zones shall be established around active sites during construction according to the CPW standards or as recommended by the wildlife biologist in consultation with the CPW. The "NO WORK" zone shall be marked with either fencing or signing. Work shall not proceed within a "NO WORK" zone until the wildlife biologist has determined that the young have fledged or the nest is unoccupied.

(e) *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.

METHOD OF MEASUREMENT

240.03 Wildlife Biologist will be measured by the actual authorized number of hours a wildlife biologist is on site performing the required tasks.

Removal of nests will be measured by the actual number of man-hours spent removing inactive nests just prior to and during the breeding season, April 1 through August 31. During this period, the Contractor shall submit to the Engineer each week for approval a list of the workers who removed nests and the number of hours each one spent removing nests.

BASIS OF PAYMENT

240.04 The accepted quantities measured as provided above will be paid for at the contract unit price for each of the pay items listed below that appear in the bid schedule.
Payment will be made under:

Pay Item	**Pay Unit**
Wildlife Biologist	Hour
Removal of Nests	Hour

Payment for Wildlife Biologist will be full compensation for all work and materials required to complete the item, including wildlife biologist, wildlife survey, and documentation (record of nest location and protection method)

Payment for Removal of Nests will be full compensation for all work and material required to complete the work
.
Clearing and grubbing will be measured and paid for in accordance with Section 201. Mowing will not be measured and paid for separately, but shall be included in the work.

Removal and trimming of trees will be measured and paid for in accordance with Section 202.

Fence (Plastic) will be measured and paid for in accordance with Section 607

REVISION OF SECTION 250
ENVIRONMENTAL, HEALTH AND SAFETY MANAGEMENT

Section 250 of the Standard Specification is hereby revised for this project as follows:

Subsection 250.01 shall include the following:

The Contractor shall review the project's Initial Site Assessment prepared by SME Environmental, asbestos and lead based paint reports, and associated documentation which indicates the potential for soil and groundwater contamination within the project area. There is a potential for encountering hazardous materials due to the presence of underground storage tanks in the vicinity of the Project and the historic use of the Town of Bayfield property. The Contractor shall be responsible for worker health and safety, materials management, characterization of suspect materials, and appropriate disposal according to state and federal regulations. The Contractor's Health and Safety Officer and/or Monitoring Technician shall be on site as necessary throughout the excavation to ensure the safety of workers and proper management of potentially contaminated materials, as detailed in the CDOT Standard Specification 250-Environmental, Health and Safety Management. The characterization, transport, and disposal of all suspect materials shall be performed with the approval of the Engineer.

Subsection 250.03 shall include the following:

A Health and Safety Officer (HSO) shall be designated on this project to draft a Material Management Plan (MMP) and Health and Safety Management Plan (HASP). The MMP will detail how the Contractor will prevent the release of contaminated materials into the environment and ensure proper waste disposal. The HASP will identify the appropriate level of worker Personal Protective Equipment (PPE) and procedures to eliminate exposure pathways from hazardous materials as in Section 250.03(c). The MMP and HASP shall be sent to CDOT Environmental for approval at least 7-days prior to the start of work.

Subsection 250.04 shall include the following:

Structures P-06-G and P-06-H have elevated concentrations of heavy metal based paint. The Contractor shall be responsible for the three major contamination issues associated with construction activities involving heavy metal paint as detailed in Section 250; (1) materials management preventing the spread of contamination into the air, water, or soil environment, (2) the health and safety of workers, and (3) the proper disposal of material(s) according to State and Federal regulations.

As detailed in the Asbestos and Lead-based Paint Reports, both structures have painted materials with a total lead content of greater than 0.01 percent (%) in paint and therefore require additional sampling and analysis to determine it the waste will exceed Resource Conservation and Recovery Act (RCRA) Hazardous Waste Limits for landfill leaching and disposal. These paint samples require analysis by the Toxicity Characteristic Leachate Procedure (TCLP). These samples should include not only paint, but a representative sample of the substrate to which the paint is adhered (e.g., concrete, wood, etc.) in ratio's representative of the waste. If after TCLP analysis, the results are less than 5.0 milligrams per liter (mg/L), the material may be disposed as solid waste at a permitted Subtitle D landfill. If the results are equal to or exceed 5.0 mg/L, then lead paint must be abated prior to demolition and disposal. Regardless of lead content, the contractor must comply with Occupational Safety and Health Administration (OSHA) Regulation 1926.62 for worker safety.

TCLP analysis is required where the total lead concentration is greater than 0.01%, and the substrate to which the paint is adhered is not metal. All metal project components (e.g., light poles, metal railing, and bridge girders) shall be recycled. As these materials are recycled, and not disposed at a landfill, it is not necessary to evaluate the content of lead by TCLP, regardless of concentration. The recycling facility must be notified in writing that metal project components contain lead.

Subsection 250.07 shall include the following:

Structures P-06-G and P-06-H have been inspected by a licensed asbestos inspector and no asbestos was identified in the reports. The contractor must obtain a State Demolition Permit, issued by CDPHE Indoor Air Quality Unit for demolition of both structures. The permit application has been partially completed by the asbestos inspector and is available upon request from CDOT Environmental. The Contractor must complete all portions of the permit application and submit to CDPHE 10 business days prior to demolition. CDPHE's Air Pollution Control Division at 303-692-3100 may provide additional assistance.

Subsection 250.09 shall include the following:

All costs associated with waste management and worker protection, including PPE, shall be included in the cost of the work. Preparation of the MMP will be included in the cost of the Environmental Health and Safety Management pay item. The Materials Sampling and Delivery item shall include the cost of laboratory analysis. The costs involved with the CDPHE Demolition Permit Application and maintenance of the permit shall be paid for as Environmental Health and Safety Management Plan. Payment for other components of the work will be made under:

Pay Item	**Pay Unit**
Environmental Health and Safety Management Plan	Lump Sum
Health and Safety Officer	Hour
Monitoring Technician	Hour
Material Sampling and Delivery	Each

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 2) as shown in subsection 703.03.

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

The aggregate base course (Class 2) and (Class 6) must meet the gradation requirements and have a resistance value of at least 70 and 78 respectively when tested by the Hveem Stabilometer method.

REVISION OF SECTIONS 304 AND 403
ABC AND HMA TICKET COLLECTION

Sections 304 and 403 of the Standard Specifications are hereby revised for this project as follows:

Subsections 304.08 and 403.05 shall include the following:

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

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

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

1. On each envelope: Project number, date of placement/paving, type of material, daily total and cumulative total.

2. One of the following:
   A. Two adding machine tape tabulations of the weight tickets with corresponding totals run and signed by different persons,
   B. One signed adding machine tape tabulation of the weight tickets that has been checked and signed by a second person,
   C. Signed check tape of computer scale tickets that have a cumulative total. These scale tickets must be consecutive and without voids adjustments.

3. A listing of any overweight loads on the envelope, including ticket numbers and amount over legal limit.

4. A comparison of the actual yield for each day's placement to the theoretical yield. Theoretical yield shall be based on the actual area paved, the planned thickness, and the actual density of the mixture being placed. Any variance greater than +/- 2.5% shall be indicated on the envelope and a written explanation included.

The Contractor shall provide a vehicle identification sheet that contains the following information for each vehicle:
(1) Vehicle number
(2) Length
(3) Tare weight
(4) Number of axles
(5) Distance between extreme axles
(6) All other information required to determine the legal limit
(7) Legal weight limit

If the Contractor fails to provide the Engineer with the required information on a daily basis, paving will not be allowed to resume unless approved by the Engineer.

All costs associated with these requirements will not be measured and paid for separately, but shall be included in the work.

REVISION OF SECTION 403
HOT MIX ASPHALT

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

Subsection 403.02 shall include the following:

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

Table 403-1

Property	Test Method	Value For Grading					
		SX (75)					
Air Voids, percent at: N (design)	CPL 5115	3.0 – 4.0					
Lab Compaction (Revolutions): N (design)	CPL 5115	75					
Stability, minimum	CPL 5106	28					
Aggregate Retained on the 4.75 mm (No. 4) Sieve for S, SX and SG, and on the 2.36mm (No. 8) Sieve for ST and SF with at least 2 Mechanically Induced fractured faces, % minimum*	CP 45	60					
Accelerated Moisture Susceptibility Tensile Strength Ratio (Lottman), minimum	CPL 5109 Method B	80					
Minimum Dry Split Tensile Strength, kPa (psi)	CPL 5109 Method B	205 (30)					
Grade of Asphalt Cement, Top Layer		PG 58-28					
Grade of Asphalt Cement, Layers below Top		PG 58-28					
Voids in the Mineral Aggregate (VMA) % minimum	CP 48	See Table 403-2					
Voids Filled with Asphalt (VFA), %	AI MS-2	70 - 85					
Dust to Asphalt Ratio Fine Gradation Coarse Gradation	CP 50	 0.6 – 1.2 0.8 – 1.6					

Note: AI MS-2 = Asphalt Institute Manual Series 2

Note: Mixes with gradations having less than 40% passing the 4.75 mm (No. 4) sieve shall be approached with caution because of constructability problems.

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 3/4" to 3/8" are considered a coarse gradation if they pass below the maximum density line at the #8 screen.
Gradations for mixes with a nominal maximum aggregate size of #4 or smaller are considered a coarse gradation if they pass below the maximum density line at the #16 screen.

REVISION OF SECTION 403
HOT MIX ASPHALT

All mix designs shall be run with a gyratory compaction angle of 1.25 degrees and properties must satisfy Table 403-1. Form 43 will establish construction targets for Asphalt Cement and all mix properties at Air Voids up to 1.0 percent below the mix design optimum. CDOT will establish the production asphalt cement and volumetric targets based on the Contractor's mix design and the relationships shown between the hot mix asphalt mixture volumetric properties and asphalt cement contents on the Form 429. CDOT may select a different AC content other than the one shown at optimum on the Contractor's mix design in order to establish the production targets as contained on the Form 43. Historically, Air Voids adjustments typically result in asphalt cement increases from 0.1 to 0.5 percent. Contractors bidding the project should anticipate this change and factor it into their unit price bid.

Table 403-2

	Minimum Voids in the Mineral Aggregate (VMA)			
Nominal Maximum Size*, mm (inches)	***Design Air Voids **			
	3.5%	**4.0%**	**4.5%**	**5.0%**
37.5 (1½)	11.6	11.7	11.8	N/A
25.0 (1)	12.6	12.7	12.8	
19.0 (¾)	13.6	13.7	13.8	
12.5 (½)	14.6	14.7	14.8	
9.5 (⅜)	15.6	15.7	15.8	
4.75 (No. 4)	16.6	16.7	16.8	16.9
	* The Nominal Maximum Size is defined as one sieve larger than the first sieve to retain more than 10%. ** Interpolate specified VMA values for design air voids between those listed. *** Extrapolate specified VMA values for production air voids beyond those listed.			

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

The hot mix asphalt shall not contain any reclaimed asphalt pavement.

Hot mix asphalt for patching shall conform to the gradation requirements for Hot Mix Asphalt (Grading SX).

A minimum of 1 percent hydrated lime by weight of the combined aggregate shall be added to the aggregate for all hot mix asphalt.

REVISION OF SECTION 403
HOT MIX ASPHALT

Acceptance samples shall be taken at the location specified in Method B of CP41.

Subsection 403.03 shall include the following:

The Contractor shall construct the work such that all roadway pavement placed prior to the time paving operations end for the year, shall be completed to the full thickness required by the plans. The Contractor's Progress Schedule shall show the methods to be used to comply with this requirement.

Delete subsection 403.05 and replace with the following:

403.05 The accepted quantities of hot mix asphalt will be paid for in accordance with subsection 401.22, at the contract unit price per ton for the bituminous mixture.

Payment will be made under:

Pay Item	**Pay Unit**
Hot Mix Asphalt (Grading SX)(75)(PG 58-28)	Ton

Aggregate, asphalt recycling agent, asphalt cement, additives, hydrated lime, and all other work and materials necessary to complete each hot mix asphalt item will not be paid for separately, but shall be included in the unit price bid. When the pay item includes the PG binder grade, any change to the submitted mix design optimum asphalt cement content to establish production targets on the Form 43 will not be measured and paid for separately, but shall be included in the work. No additional compensation will be considered or paid for any additional asphalt cement, plant modifications and additional personnel required to produce the HMA as a result in a change to the mix design asphalt cement content.

Historically, typical asphalt cement increases reflected on the Form 43 are from 0.1 to 0.5 percent. However, the Contractor should anticipate the AC increases typical of his mixes. Contractors bidding the project should anticipate this change and factor it into their unit price bid.

When the pay item does not include the PG binder grade, asphalt cement will be measured and paid for in accordance with Section 411. Asphalt cement used in Hot Mix Asphalt (Patching) will not be measured and paid for separately, but shall be included in the work.

Excavation, preparation, and tack coat of areas to be patched will not be measured and paid for separately, but shall be included in the work.

REVISION OF SECTION 420
GEOTEXTILE MATS IN WETLAND AREAS

Section 420 of the Standard Specifications is hereby revised for this project as follows:

Subsection 420.01 shall include the following:

This work shall include the installation of temporary geotextile mats in the wetland areas temporarily impacted by construction.

Subsection 420.02 shall include the following:

The Contractor shall cut existing vegetation within temporary impact wetland areas in a manner that the roots are left intact. All shrubs in temporary impact areas shall be trimmed to within 2 inches of the ground.

A silt fence shall be constructed in accordance with Section 208 to properly delineate the boundary of the temporary impact wetland areas and to protect the surrounding wetland areas.

Subsection 420.07 shall include the following:

The cleared temporary wetland impact areas shall be protected with geotextile (Erosion control)(Class A), followed by a 12 inch layer of loose certified weed-free straw and a minimum of 2 feet of soil. Construction equipment will be allowed to move across the site on top of this fill.

After construction activities are complete, soil, straw, and geotextile shall be carefully removed as directed. The final lift shall be removed using a toothless backhoe. Silt fence shall be removed only after all activity in the wetland areas is complete. Straw and geotextile shall become property of the Contractor and shall be removed and disposed of outside of the project limits. All soil shall be removed and disposed of outside the project limits. Excess fill shall not be used in wetland areas.

Subsection 420.10 shall include the following:

Trimming, geotextile, earthwork, and weed-free straw required for protecting the existing wetland vegetation will not be measured and paid for separately but shall be included in the work.

Removal and disposal of materials will not be measured and paid for separately but shall be included in the work.

Silt Fence will be measured and paid in accordance with Section 208.

REVISION OF SECTION 504
CONCRETE PANEL FACING MSE WALL

Section 504 of the Standard Specifications is hereby revised for this project to include the following:

DESCRIPTION

504.06 This work consists of constructing a Concrete Panel Facing Mechanically Stabilized Earth (MSE) Retaining Wall System at the locations and to the lines and grades shown on the plans. Either metallic or geosynthetic reinforcement (woven fabrics or geogrids) as specified in this specification may be used as MSE reinforcement in the reinforced structure backfill zone. The retained structure backfill zone is the structure backfill retained by the reinforced structure backfill zone as shown on the plans.

MATERIALS

504.07 Shop Drawings. The Contractor shall submit six sets of shop drawings and certified material test reports for review prior to construction of the wall. See subsection 504.12, for a complete list of submittal requirements. Shop drawings shall be submitted in accordance with subsection 105.02.

The shop drawings shall provide the details necessary to demonstrate compliance with the Contract, including:

(a) *Wall Layouts.* Wall layouts shall conform to lines and grades on the plans including start, corner, and end stations, leveling pad step breaks, total number of panels and top and bottom of wall elevations. For walls with rail anchoring slabs, the top of panel elevations shall be within 8 inches of the elevation shown on the plans measured from the bottom of anchoring slab. The construction batter required to achieve the batter shown on the plans shall be shown on the shop drawings. If temporary walls are required for the construction of permanent wall, the permanent wall vendor shall provide the shop drawings and certified material test reports for temporary walls.

(b) *Panel and Reinforcement Locations.* Unless otherwise shown on the plans, each layer of soil reinforcement shall be connected to the back of each facial panel and the panel numbering and placement sequence shall be shown. The back of each panel shall be logically numbered with its location.

Panel to panel, panel to reinforcement connection detail, and limits of special panels at curved wall corner shall be shown.

(c) *Wall Elevations*. Except for the top of the leveling pad, wall elevations given on the plans are based on the desirable wall height. The actual panel and reinforcement elevations shall be marked on the shop drawings by taking into account the supplied panel as well as special panel heights for matching the front and top finished grade.

(d) *Soil Reinforcement Material*. The soil reinforcement type, Minimum Average Roll Value of the Ultimate tensile strength T_{ULT} (MARV) for geosynthetic soil reinforcement or yield strength for metallic soil reinforcement, spacing, lengths, elevations, and the corresponding wall design height shall be shown on the shop drawings. The starting and ending stations for change in grade of reinforcement material shall be shown for walls with different grade of reinforcement material at the same elevation. Material grade shall be clearly identified on each roll of reinforcement to avoid errors in placement. Elevations of the reinforcement layers shall be as specified on the shop drawings.

(e) *Soil Reinforcement Length (RL).* The soil reinforcement length shall be measured from the back face of the concrete panel to end of the soil reinforcement as measured to the last cross member. Except for secondary reinforcements, soil reinforcement lengths shall not be less than the lengths specified on the plans.

For wall segments with a Design Height (DH) greater than or equal to 8 feet, the soil reinforcement shall be the same length from top to bottom of the wall.

For walls segments with a Design Height (DH) less than 8 feet, the length of the top layer of soil reinforcement shall be 8 feet and all other layers of soil reinforcement shall be the same length from top to bottom of the wall.

Unless shown otherwise on the plans, the soil reinforcement lengths shall be as follows:

Design Height (DH)	Reinforcement Length (RL)	Reinforcement Length Top Layer
DH ≤ 6'-0"	6'-0"	8'-0"
6'-0" < DH < 8'-0"	DH	8'-0"
DH ≥ 8'-0"	0.7 x DH but not less than 8'-0"	0.7 x DH but not less than 8'-0"

The Reinforcement Lengths shown on the shop drawings shall be the reinforcement length required for internal stability and pull-out only, but they shall not be less than those shown in the table above. External stability (bearing pressure, sliding and overturning) and global stability have already been considered and checked in the design.

(f) *Panel Size and Soil Reinforcement Spacing*.

1. Except for full height panels, the maximum panel size is 50 square feet and the minimum panel height shall be 30 inches.

2. For full height panels, the maximum panel width shall be 10 feet and the maximum panel height shall be 30 feet. Differential deflection between adjacent panels shall be limited to 1/500. The vendor shall supply design calculations regarding panel concrete crack size control during shipment and construction and estimated joint width and differential deflection limits. The use of full height panels with widths greater than 10 feet or heights greater than 30 feet shall be approved by the Engineer.

3. The maximum vertical spacing between layers of adjacent soil reinforcement shall not exceed 30 inches. Except the half height panel used at the top and bottom of wall, including all partial and extended height panels at the top of wall there shall be at least two layers of reinforcement per panel.

4. The first and bottom layers of reinforcement shall be within 15 inches measured from the top of panel and from the top of leveling pad accordingly.

5. Shiplap joints shall be required at horizontal and vertical joints for segmental panel walls and all vertical joints for full height panel walls. The gap between two adjacent panels shall be ½ to 1 inch. Shiplap joints are not required at the vertical joints of segmental and full height panel when a minimum of 12 inches depth of continuous crushed rock wrapped with Class 2 Geotextile is installed behind the joints as shown in the shop drawings. Geotextile (Class 2) and crushed rock will not be measured and paid for separately, but shall be included in the work. Neoprene cushions shall be provided at all horizontal joints as shown in the plans.

(g) *Long Term Design Strength (LTDS) of Reinforcement*.

1. The design charts on the plans define the strengths required for the zone of mechanical reinforcement of soil. Based on the total summed LTDS, the reinforcement proposed by the shop drawings for a specific wall height shall meet or exceed the total LTDS shown on the plans. This proposed reinforcement shall allow for a maximum of plus or minus 15 percent variation in each individual layer.

2. Metallic (Inextensible) Soil Reinforcement. The net section at the soil reinforcement to panel connection shall be used for the sacrificial thickness calculation. The following minimum sacrificial thickness for reinforcement shall be used for the 75 year LTDS calculations:

Galvanization Loss	15 µm/year for first 2 years 4 µm/year for subsequent years
Carbon steel loss	12 µm/year after zinc depletion

3. Geosynthetic (Extensible) Soil Reinforcement. Geosynthetic soil reinforcement shall be a geogrid or woven geotextile. For polyester (PET), polypropylene (PP) and high-density polyethylene (HDPE) reinforcement, the LTDS of material shall be determined using the following factors of safety to ensure the required design life. Unless otherwise specified, LTDS shall not exceed the following K percent of its ultimate tensile strength, T_{ULT} (MARV), i.e.

$$LTDS = K * T_{ULT} (MARV),$$

(1) Geogrid reinforcement (HDPE, PET):

Products	K
Tensar	20%
Fortrac, Miragrid, Strata, Synteen and Raugrid	24%

(2) All products not listed above:

Products	K
All geogrid or woven geotextile products meet AASHTO Standard Specifications for Highway Bridges, 16th Edition	10%
Products not meet AASHTO Standard Specifications for Highway Bridges, 16th Edition including Non-woven geotextile products	5%

(h) *Design Heights and Supplied Reinforcing Material*. Unless otherwise defined on the plans, the wall design height shall be measured vertically from the top of the leveling pad to the top of the concrete rail anchoring slab for walls with railing, or to the top of the cast-in-place concrete coping for walls without railing. For walls that are in front of a bridge abutment that is founded on a deep foundation, the design height used to determine the soil reinforcement length shall be measured vertically from the top of the leveling pad to the top of the roadway carried by the bridge and the wall. Bridge approach slabs shall not be considered in the design of the MSE wall.

For both geosynthetic and metallic reinforcement, the required reinforcement LTDS and the supplied LTDS (determined in accordance with the K factors or depletion of material as defined above) with corresponding brand and grade of material shall be marked clearly on the elevation view or in a tabulation summary. The LTDS of the supplied reinforcement grade must meet or exceed the required LTDS corresponding to the reinforcement spacing provided.

(i) *Tiered Walls*. For the reinforcement layouts of tiered walls, the overall geometry, the reinforcement length and the sum of the LTDS provided from all layers in all tiers shall be in close conformity with the retaining wall system shown on the plans in order to ensure that local, global, and internal stability requirements have been met.

(j) *Obstructions*. Details for the placement of soil reinforcement around obstructions (i.e. steel piles, concrete piers, concrete boxes, pipes, etc.) shall be shown on the shop drawings. Design calculations shall be provided showing that the internal stability of the wall meets the required safety factors in the area of the obstruction.

(k) *Table of Quantities*. A table comparing the Structural Backfill (Class 1), Mechanical Reinforcement of Soil, Geomembrane, and Panel Facing quantities shown on the plans to the quantities shown in the shop drawings and percent difference (positive percent indicates an increase in shop drawing quantities from the plans) shall be shown on the shop drawings. Structure Backfill (Class 1), Mechanical Reinforcement of Soil, Geomembrane, and Panel Facing quantities shall be calculated in accordance with the Contract. The Contractor shall notify the Engineer of the difference in plan and shop drawing quantities before wall construction begins.

(l) *Placement Schedule*. Geomembrane placement schedule and clearances to soil reinforcements shall be shown.

(m) *Vertical Slip Joints*. Locations of vertical slip joints for differential settlement relief shall be as specified in subsection 504.16.

-5-

REVISION OF SECTION 504
CONCRETE PANEL FACING MSE WALL

504.08 Backfill. Unless otherwise specified on the plans, wall backfill material in the reinforced structure backfill zone and the associated trapezoidal retained structure backfill zone shall conform to the requirements for Structure Backfill (Class 1) of Section 206. For reinforcement tensile stress and associated pullout, a friction angle of 34 degrees shall be assumed for Structure Backfill (Class 1). Structure Backfill (Class 1) shall be considered to be non-aggressive soil for corrosion and durability computations. All reinforcing elements shall be designed to ensure a minimum design life of 75 years for permanent structures.

504.09 Leveling Pad. Concrete for the leveling pad shall be Concrete (Class D) conforming to the requirements of Section 601. Unless specified on the plans, the maximum vertical step shall be no greater than 36 inches. The leveling pad shall be reinforced only at the steps. When the toe of wall is founded on slope steeper than 1.5 (H) to 1 (V), the leveling pad shall be constructed with reinforced concrete with same reinforcing schedule as at its steps. Leveling pad concrete shall be cured for at least 12 hours before placement of the concrete panels. To avoid panel cracking from high contact points, a ¼ inch thick expansion joint material with the same thickness as the panels may be installed between the first layer of panels and the leveling pad.

504.10 Geomembrane and Joint. A Geomembrane shall be installed on all walls at the top of the reinforced structure backfill zone and retained structure backfill zone to intercept surface runoff and prevent salt penetration into the backfill of the wall as shown on the plans. The Geomembrane shall meet the requirements of subsection 712.08 for geomembrane, and shall have a minimum thickness of 30 mils. It shall be spliced with a dual track field seamed joint in accordance with ASTM D4437 or ASTM D7717. For small local coverage areas, less than 30 square feet, the membrane may be spliced using a 6 inch minimum overlap and an adhesive or a single seam portable thermal welding tool, as suggested by the membrane manufacturer and approved by the Engineer. Unless otherwise shown on the plans, the membrane shall have a minimum coverage length measured perpendicular to the wall face of at least the wall Design Height (DH) plus Soil Reinforcement Length (RL) plus 1.5 feet. The membrane shall be installed with a slope between 20:1 (minimum) and 10:1 (maximum) , as shown in the plans, from the panel facing to a drainage system located at the cut or pre-filled slope as shown on the plans.

The drainage system shall consist of a 12 inch wide Geo-Composite strip drain inserted into a slot in the Geomembrane, at 10 foot maximum spacing, that collects the water from the membrane and conveys it to a water collector system at the toe of the 1:1 slope as shown on the plans. The water collector system shall consist of a 4 inch diameter perforated collector pipe surrounded by Filter Material Class B and wrapped with Class 3 Geotextile. A 4 inch diameter non-perforated drain pipe, at 100 foot maximum spacing, shall be used to discharge the water in the water collector system out the face of the wall.

Alternatives for the drainage system shown on the plans may be used by the Contractor. A detailed layout of this equivalent water collection system shall be provided by the Contractor and approved by the Engineer.

For tiered walls, a Geomembrane shall be installed between the top of the bottom wall and the toe of the top wall as shown on the plans.

-6-

REVISION OF SECTION 504
CONCRETE PANEL FACING MSE WALL

504.11 Pre-Cast Concrete Panel Facing Unit and Panel Joint Material. The pre-cast concrete panels shall conform to the requirements shown on the plans and these specifications including the color, texture, dimensions and pattern. These facing units shall be factory made with Class B Concrete with the following additional requirements:

(1) Minimum Cementitious Content: 610 lb./cu. yd.
(2) No more than 50 percent fine aggregate (AASHTO M6) by volume of total aggregate.
(3) Ambient temperature: shall be a minimum of 40° F and rising when casting panels.
(4) Pre-cast panels shall be cured in accordance with AASHTO M170.

Reinforcing steel shall conform to the requirements of Section 602 of the specifications. The concrete in the pre-cast units shall be compacted using a vibrating table, grid vibrator, or screed vibrator. All panels shall be cast face down on flat level surface.

Panel dimensions and facing treatment shall conform to the architectural requirements shown on the plans. Width of panel from center to center of joint shall be an even whole increment of the pattern dimensions selected to match the architectural treatment. Thickness shall be a minimum of 6 inches plus the depth of rustication. Panel shall be cast to the dimension that accommodates the architectural treatment.

Panels may be longer than 5 feet provided their section strength can be shown to accommodate handling and erection without cracking. Soil reinforcement attachment devices shall be within 1 inch of shop drawing locations. All unit dimensions shall be within ¼ inch of plan. Concrete surface for the front face of the wall shall match the architectural treatment requirements and structural concrete color shown on the plans. Squareness determined by the difference between two diagonals, shall not exceed ½ inch Surface defects on the front face textured surface, shall not exceed $^{3}/_{16}$ inch when measured with a 5 foot straight edge, except when intentionally roughened.

The Engineer shall be allowed access to the manufacturer's facilities to inspect and sample units from lots prior to delivery with a minimum of 2 working days advance notice. The Engineer will reject any concrete panels, which do not meet the requirements of this specification. Panels shall not be shipped until the concrete strength, at the time of shipping, is greater than 0.9 times f'_C. The Contractor shall notify the Engineer in writing at least 3 working days before shipment of panels begins.

Cover on the back face of the wall for horizontal and vertical joints is required between panels and shall be a drainage geotextile conforming to Subsection 712.08, a minimum of 12 inches wide, nailed or glued in place prior to placing backfill.

At horizontal joints, a cellular type or molded expansion joint material shall be placed and shall be a size suggested by the supplier and approved by the Engineer.

504.12 Certifications, Calculations and Testing Reports. The Contractor shall provide the following reports, certifications, calculations and checklists as needed to accompany the shop drawing submittal. All engineering

calculations, as stated in subsections 504.07(f), 504.07(g), 504.07(j), 504.07(k), 504.12(e), 504.12 (f), 504.12(g), and 504.12(i) shall be certified and stamped by a Professional Engineer licensed in the State of Colorado.

(a) *Certification of T_{ULT} (MARV).* For geo-synthetic reinforced system only, the Contractor shall submit a certification letter from the manufacturer which provides the T_{ULT} (MARV) and certifies the T_{ULT} (MARV) of the supplied materials have been determined in accordance with ASTM D4595 or ASTM D6637 as appropriate.

(b) *Mill Report for Metallic Reinforcements and Connectors*. This includes, but is not limited to mill certifications on weldability, ultimate tensile and yield strength.

(c) *Report of The Panel-Reinforcement Connection Test*. The test report shall be prepared and certified by an independent laboratory. The panel to reinforcement connection test method shall conform to the industrial standards. The report shall provide data on the ultimate as well as service limit state.

(d) *Report for Soil to Reinforcement Interface Pullout Test*. The test report shall be prepared and certified by an independent laboratory. The soil to reinforcement interface pullout test method shall conform to the requirements of ASTM D6706. Tests shall include the full range of overburden pressures defined by wall design heights.

(e) *Certification of Facial Panel to Reinforcement Long-Term Connection Strength*. Certification shall include calculations to demonstrate that the facial panel to reinforcement connection meets or exceeds current AASHTO 75 years design life requirements.

(f) *Certification of Reinforcement Pullout*. Certification shall be provided with detail calculations to demonstrate that reinforcement pullouts meet or exceed current AASHTO requirements. For metal reinforcement breakage and pullout, calculations shall include a combination of 75 years material depletion of carbon steel and galvanization loss.

(g) *Report and Certification for the Initial Concrete Compression Strength, Shipping and Handling Stress*. Cylinder compressive test is acceptable to verify the initial concrete strength of panel at time of shipping. Concrete tensile stress shall not exceed the modulus of rupture. Report shall include calculations of panel cracking stress according to the proposed method of lifting and shipping. Before panel shipping from precast yard to wall site, the Engineer will approve the time of shipping, method of lifting and supporting condition during shipping as well as storage condition at the site before panel installation.

(h) *Calculations*. Calculation of the LTDS of reinforcement shall conform to the 17th edition of the AASHTO Standard Specifications for Highway Bridges.

(i) *Efflorescence and Air Content Test*. Panel shall be visually efflorescence free. Efflorescence control agent shall be used in concrete mix design. When fly ash is used as the efflorescence control agent, the fly ash shall be ASTM C618 Class F fly ash and shall be a minimum of 20 percent by weight of the total cementitious material content. Air Content shall be determined in accordance with AASHTO T152. Concrete shall be tested a minimum of the first three batches each day and then once per five batches for the rest of the day to assure specified air entrainment.

(j) *Submittal Checklist*. The Contractor shall submit the Panel Faced MSE Wall Submittal Checklist, Form 1402 with the Certifications, Calculations and Testing Report submittal package included with the shop drawing submittal.

504.13 Hybrid MSE Wall Systems.

A hybrid system is one which combines elements of both externally and internally stabilized systems.

An externally stabilized system uses a physical structure to hold the retained soil. The stabilizing forces of this system are mobilized either through the weight of a shape stable structure or through the restraints provided by the embedment of wall into the soil, if needed, plus the tieback forces of anchorages.

An internally stabilized system involves reinforced soils to retain fills and sustain loads. Reinforcement may be added to either the selected fills as earth walls or to the retained earth directly to form a more coherent stable slope. These reinforcements can either be layered reinforcements installed during the bottom-to-top construction of selected fills, or be driven piles or drilled caissons built into the retained soil. All this reinforcement must be oriented properly and extend beyond the potential failure mass.

Hybrid MSE wall systems may be used unless otherwise noted on the plans. Hybrid MSE wall systems are subject to the same design requirements for MSE walls and this specification. The shop drawings for the Hybrid MSE wall system shall include a combination of design calculations and appropriate test results to demonstrate that it meets or exceeds the regular system. Hybrid MSE wall systems shall have a facing area of 3.5 square feet and be stabilized by a counterfort. The Certifications, Calculations and Testing Reports in subsection 504.12(e) is not required for Hybrid MSE wall systems. The facing to soil reinforcement connection test, subsection 504.12(c) under MATERIALS, may be waived only if the soil reinforcing spacing is less than or equal to 8 inches or the facing is secured and stabilized by hybrid components with primary reinforcement spacing less than 24 inches.

The Contractor shall provide the following additional reports, certifications and calculations to accompany the shop drawing submittal for Hybrid MSE wall systems:

(1) The facing to counterfort long-term connection test.

The Contractor shall submit the Block Faced MSE Wall Submittal Checklist, Form 1401 and the Panel Faced MSE Wall Submittal Checklist, Form 1402, with the Certifications, Calculations and Testing Report submittal package included with the shop drawing submittal.

REVISION OF SECTION 504
CONCRETE PANEL FACING MSE WALL

CONSTRUCTION REQUIREMENTS

504.14 Approval and Qualifications of MSE Wall Installer. The job site wall foreman shall have experience in construction of at least five transportation related MSE walls within the last three years. Transportation related MSE walls are walls that carry or are adjacent to vehicular traffic and are constructed with MSE reinforcement in the reinforced structure backfill zone. The foreman must have prior experience or adequate training on the products that the Contractor elects to use in the project. The resume and credentials of the foreman shall be submitted to the Engineer for approval prior to the pre-construction meeting. The foreman shall be on the site for 100 percent of time during which the work is being done.

504.15 Wall Test Segment. The wall test segment shall be the first segment of the wall constructed. The wall test segment shall be constructed in the presence of the Technical Representative and the Engineer and shall include construction of each of the 5 elements listed in 504.15 below. The minimum length of the wall test segment shall be 40 feet or the full length of the wall if less than 40 feet. A wall test segment shall be constructed for the first wall constructed from each wall product used on the project.

504.16 Technical Representative of Wall Product Supplier. The Contractor shall arrange for a technical representative (Tech Rep) of the manufacturer of the selected wall products to be present during the construction of each wall test segment. If the selected wall products are supplied from different manufactures, a Tech Rep from each wall product shall be present. The Tech Rep shall be present for construction of the wall test segment and each of the following elements:

(1) Placement of a minimum of the first four layers of primary soil reinforcement and backfill,

(2) If obstructions (i.e. steel piles, concrete piers/abutments, concrete boxes, pipes, etc.) exist, placement of primary soil reinforcement and backfill at obstructions,

(3) Placement of a minimum of the first two rows of panels or a minimum of a four foot wall height,

(4) If a vertical slip joint is required, construction of the vertical slip joint in a minimum of a two row portion of panels or a minimum of a four foot wall height, and

(5) If corners are required, construction of a corner representative of the corners in the wall in the project in a minimum of a two row portion of panels or a minimum of a four foot wall height.

Before construction of the wall test segment the Tech Rep shall provide the Contractor and the Engineer the following:

(1) Technical instructions as required in the construction of the earth retaining wall system.

(2) Product specific specifications in the placement of the soil reinforcement and backfill in accordance with the wall system.

(3) Guidelines in placing the facing units and attaching them to the soil reinforcement in accordance with the system requirements.

(4) Provide technical assistance to the facing unit fabricator.

At the completion of the wall test segment the Tech Rep shall provide the following:

(1) Documentation that the wall test segment was constructed in accordance with the product specific specifications. This documentation shall include a location description (starting and ending stations and elevations) of the wall test segment.

(2) Documentation that the job site wall foreman is familiar with the wall products used to construct the walls on the project.

After completion of the wall test segment the Tech Rep shall be available whenever there is any special field condition such as change of geological condition, when there are equipment or personnel changes, or when requested by the Engineer.

504.17 Facial Panel Quality Control, Placing Plan and Daily Placement Logs. Before the start of wall construction, the Contractor shall provide a panel-placing plan and shall supply daily placement logs to the Engineer weekly and at the completion of the wall. The daily placement log shall consist of an elevation view of the wall showing the dates, number of panels placed, and the serial numbers of the panels placed. The panel quality control shall contain multiple submittals if required by subsections 504.12(g) and (h). Panels shall be labeled with serial number for each panel and corresponding certification with one set of random samples tested for each 220 panels or 5500 square foot of wall face. At least one certification with supporting test results is required for each wall. Test results will be reviewed and pre-approved by the Engineer before shipment. The Contractor shall coordinate and mark the panel and backfill placing sequence on the daily placement logs. The log serves as means for the Engineer to identify where each panel was placed.

504.18 Wall With Curved Alignments, Tight Curved Corners, and Sections Adjacent To Bridge Abutment. The Contractor shall provide a placement plan that shows curved layouts, special corner panel, sequence of panel placement, and construction off-sets as recommended by the manufacture. For tight curved corners, 8 foot radius or less, and dissimilar foundations such as bridge abutment, to avoid panels with random cracks, the Contractor shall install vertical slip joints as shown on the shop drawings.

504.19 Excavation and Backfill. The base of leveling pad shall receive the same compaction as cut area required by subsection 203.07. The Contractor shall report to the Engineer in writing density test results for any unsatisfactory bearing material that does not meet the minimum 90 percent compaction for walls less than 16 feet high and 95 percent of T-180 for walls higher than 16 feet. If the excavation for the placement of the leveling pad exposes an unsatisfactory bearing material, the Engineer may require removal and replacement of that material. The removed material shall be replaced with Structure Backfill (Class 1) compacted in conformance with subsection 206.03. The Engineer with the assistance of the geotechnical engineer of record will provide the limits including the depth of removal. As directed by

the Engineer, and if required, Structure Backfill (Class 1) shall be reinforced with soil reinforcements in conjunction with wick drains and outlet pipes

The Contractor shall grade the foundation for the bottom of the wall for a width equal to or exceeding the limits of the Reinforcement Length (RL) plus 18 inches as shown on the plans. This graded area shall be compacted with an appropriate vibratory roller weighing a minimum of 8 tons for at least five passes or as directed by the Engineer. For cut wall with continuous seepage, phasing of foundation construction or a different drainage and foundation improvement plan may be necessary.

The reinforced structure backfill zone and the retained structure backfill zone portion immediately behind the wall as defined on the plans shall be Structure Backfill (Class 1). Recycled asphalt, recycled concrete and flow-fill material shall not be substituted for Structure Backfill (Class 1). Each compacted layer of backfill within a distance equal to the reinforcement spacing away from the back of the panels shall not exceed 4 inches. The triangular or trapezoidal portion behind the concrete panels and above the spill of backfill, as shown on the plans, shall be filled with ⅜⁺ inch crushed rock, filter aggregates with filter fabric, or wall system specific fill as approved by the Engineer. Density tests behind and parallel to the wall in the triangular or trapezoidal portion above the backfill spill zone are not required. Each compacted layer of backfill shall be in even increments up to 8 inches thick. The fill and compaction operation shall start 3 feet from the wall back face and progress toward the end of the reinforcement. All Structure Backfill (Class 1) including fill material under the wall and on-site material as allowed by subsection 504.08 shall be compacted to a density of at least 95 percent of the maximum density according to AASHTO T 180. For on-site foundation material containing more than 30 percent retained on the ¾ inch sieve, a method of compaction consisting of a conventional heavy vibratory roller starting with minimum 5 passes shall be used to establish the number of passes required to exceed the 95 percent T180.

At least 6 inches of material shall be in place prior to operation of tracked vehicles over soil with reinforcement. Only power operated roller or plate compaction equipment weighing less than 1,000 pounds is allowed within 3 feet of the front of the wall face. The reinforcement shall not be connected to the wall until the compacted fill is at or slightly higher than the location of the connector.

Backfill containing frost or frozen lumps shall not be used. Backfill that has been placed and becomes frozen shall be removed and replaced at the Contractor's expense. If cold weather conditions prevent the placement of Structure Backfill (Class 1), the Contractor may use Filter Material Class B as backfill without compaction at the Contractor’s expense and approved by the Engineer. The Contractor shall provide a test report, prepared and certified by an independent laboratory, that the internal friction angle of soil for the Filter Material Class B meets or exceeds that shown on the plans.

The Contractor shall place additional panels including partial height panels and properly compacted fill material to return the finished grade to the plan elevations if settlement, as determined by the Engineer, has occurred. A final inspection before the installation of rail anchoring slab will be made after construction settlement, if any, has occurred or 30 days after the completion of the wall. The Contractor shall provide immediate temporary storm water protection and wind erosion control at the end of each day during construction. If settlement occurs as the result of loss of backfill due to wind or water erosion, non-conforming backfill such as frozen fill or over-saturated fill, or if the backfill does not meet

compaction requirements, the Contractor shall remove the backfill, wash the soil reinforcement, and bring the elevation to the finished grade at the Contractor's expense. Before final project acceptance, the Contractor shall repair any backfill losses due to wind and water erosion.

To avoid the foundation of the leveling pad being washed out by rain, the area in front of the wall and around the leveling pad shall be backfilled as soon as practicable.

504.20 Reinforcement. Steel reinforcement shall be slack free and geosynthetic reinforcement shall be slightly pre-tensioned. The minimum coverage ratio for geogrid reinforcement shall be 67 percent and the spaces between rolls shall be staggered between layers of soil reinforcement. The minimum coverage ratio for woven fabric reinforcement shall be 100 percent and an overlap between rolls is not required. Soil reinforcement shall not be cut to avoid obstruction unless shown on the shop drawings.

504.21 Leveling Pad. The foundation of the leveling pads shall meet the requirement of subsection 504.16 immediately above. The leveling pad shall be level within the tolerance of ⅛ inch for any two points along the length of a panel, and within ¼ inch for any two points 10 feet apart. If the wall is not level, the panels will bind against each other causing spall of the edges and corners.

Cushion or shimming material (Expansion Joint Material, Concrete Mortar Grout, Roofing Felt or Geosynthetic Reinforcement) shall be used to support panels directly founded on the leveling pad. Before starting a new course of panels, the Contractor shall take steps to ensure that the wall elevations are matched at the neighboring panels. Cushion or shimming material shall be used to obtain necessary panel elevations at next leveling pad step. No more than 2 shims (each 3/16 inch thick) should be required to level the panels on the leveling pad.

504.22 Wooden Wedges. Wooden wedges are used to help to hold the panels at the correct batter during the backfill operation. The wooden wedges shall be made from hard wood (such as oak, maple or ash). Wooden wedges shall be removed as soon as the precast panels above the wedged panels are completely erected and backfilled. There shall not be more than three rows of wooden wedges in place at one time. Panels that crack or spall due to failure to remove the wooden wedges shall be repaired or replaced.

504.23 Panel Facing. For walls that support a roadway, the wall layout line at the leveling pad shall be setback and pre-measured with appropriate batter (5 to 8 percent) from the top of the panels according to the offset with respect to the centerline of the road. For walls adjacent to a roadway, the wall layout line at the leveling pad shall be directly offset from the centerline of the road. An overall negative batter (wall face leaning outward) between the bottom and the top of the wall is not allowed. Unless otherwise noted on the plans for battered walls, the final wall face shall be vertical, or have a positive batter of not greater than 5 percent for construction control purpose. The surface of the wall face shall be tested with a 10 foot straightedge laid along the surface in horizontal and vertical directions. Except as necessary for horizontal alignment of the wall, convex deviation of the wall face from the straightedge (belly wall) shall not be allowed, and concave deviation from the straightedge shall be less than ½ inch.

-13-
REVISION OF SECTION 504
CONCRETE PANEL FACING MSE WALL

Walls without a rail-anchoring slab, cast-in-place reinforced concrete coping with uniform exposed height is required to match the required finished elevations as well as to retain the panels' lateral deformation.

For walls with rail anchoring slabs, the top of panel elevations shall be within 8 inches of the bottom of the anchoring slab. Cast-in-place concrete or saw-cut partial height panels may be used to accomplish this.

Where the Geomembrane for drainage interferes with the continuation of reinforcement, the panels beyond the termination shall be reinforced with the same grade of additional soil reinforcing material to maintain the total amount of reinforcement per panel. To avoid leaking or soil erosion through the joint, a filter fabric at least 12 inches wide shall be glued to the panels behind all vertical joints.

As shown on the plans, facing panels directly exposed to spray from deiced pavements and indirect windborne spray shall have three coats of water resistant or repellant concrete sealer applied to the front face of the wall before the wall is opening to traffic.

For completed wall or parts of completed wall, before final payment any damages including blemish and discoloring of panel shall be replaced or repaired. Sand blasting may be used if accepted by the Engineer.

504.24 Fill under Leveling Pad. For walls requiring fill under the planned elevation of the leveling pad, the Contractor may lower the elevation of the leveling pad as approved by the Engineer, except that the finished elevation at the top of the wall shall not be altered. As requested by the Contractor, and with the Engineer's approval, the higher wall shall be redesigned with longer reinforcement length and revised reinforcement schedule.

METHOD OF MEASUREMENT

504.25 MSE retaining walls will not be measured for payment in the field, but will be paid for by the calculated quantities shown on the plans for the five major components of the wall: structure excavation, structure backfill, concrete panel facing, mechanical reinforcement of soil, and geomembrane. The Contractor's construction of a system that requires increased or decreased quantities of any of the components to complete the wall to the dimensions shown will not result in a change in pay quantities. Exceptions will be made when field changes are ordered or when it is determined that there are discrepancies on the plans in an amount of at least plus or minus five percent of the plan quantity.

(1) The panel facing quantity was calculated for the square foot of wall front face area from the top of the leveling pad (or average pad elevations) as shown on the plans to the top of the anchoring slab for walls with railing, or to the top of the cast in place coping for walls without railing.
(2) The structure excavation quantity was calculated for the total volume of earth to be removed before the installation of the reinforced zone as shown on the plans.
(3) The structure backfill quantity was calculated for the total volume behind the wall (the retained structure backfill zone) including the material in the reinforced zone as shown on the plans.
(4) The mechanical reinforcement of soil quantity was calculated for the total volume of the reinforced zone as shown on the plans.

(5) Geomembrane was calculated as the design height (DH) plus soil reinforcement length (RL) plus 1.5 feet, disregarding the slope of the membrane.

The square foot and cubic yard quantities computed for payment are the wall plan quantities based on the height measured at 20 foot maximum intervals along the wall layout line.

BASIS OF PAYMENT

504.26 The accepted quantity will be paid for at the contract unit price per unit of measurement for the pay items listed below:

Payment will be made under:

Pay Item	**Pay Unit**
Precast Panel Facing	Square Foot

Structure excavation will be paid for under the Section 206 Pay Item Structure Excavation. Structure backfill will be paid for under the Section 206 Pay Item Structure Backfill (Class 1). Soil reinforcement will be paid for under the Section 206 Pay Item Mechanical Reinforcement of Soil. Geomembrane will be paid for under the Section 420 Pay Item Geomembrane.

Rail anchoring systems (slabs) at the tops of walls and leveling pads at the bottom of wall will be measured and paid for separately under the Section 601Pay Item Concrete and the Section 602 Pay Item Reinforcing Steel.

Payment will be full compensation for all work and materials required to construct the concrete panel facing MSE wall. Miscellaneous items such as dual track welding of Geomembrane, drainage ditches, rundowns, filter material, filter fabric, grout, pins, shimming material, ¼ inch thick expansion joint material, concrete coating and providing a technical representative will not be measured and paid for separately but shall be included in the work.

504.27 Panel Facing Payment Reductions. In this subsection, a "panel" refers to either a concrete panel or a hybrid unit. Each of the following shall be considered a defect:

(1) Dislocated Panel. A dislocated panel is an individual panel or its corner located outward more than ¼ inch from the adjacent panels.
(2) Cracked Panel. A cracked panel is an individual panel with any visible crack when viewed from a distance equal to the wall height in natural light.
(3) Corner Knock Off. A corner knock-off is a panel with any missing facial corners or architectural edges.
(4) Substandard panel. Substandard panels are concrete panels installed in any wall segments that do not meet the certified values for compressive strength. Each substandard panel counts as one defect.
(5) Oversize Joints. Panels with oversize joints are two adjacent panels that do not meet the required values in subsection 504.07(f).

-15-
REVISION OF SECTION 504
CONCRETE PANEL FACING MSE WALL

(6) Panels Failing the 10 Foot Straightedge Test. Straightedge test failures are joints that that deviate from even by more than ¼ inch when measured by placing a 10 foot straightedge across the joint.

Defects shared by two adjacent panels such as oversized joint, dislocated panel and panels not passing 10 foot straight edge test will be count as one defect.

In the completed wall, or completed portion of the wall the number of defects, as described above, in each 40 foot section (horizontal or arc length) will be counted. If there are defects, the number of defects in the 40 foot section will be considered for price reduction according to the table below. For panels subjected to price reduction, if the defects are repairable or the overall quality of wall can be improved, with the consent from the Engineer, the Contractor may elect to repair and reduce the percent of price reduction. A walkthrough inspection shall be made as requested by the Contractor before final payment.

No. of Defects in 40 Foot Section	2	3	4	5	> 5
% Of Price Reduction for that section	3	9	15	21	Rejection

When the number of defects exceeds 5, the Engineer will reject the entire wall or portions thereof. The Contractor shall replace the rejected wall at his own expense.

REVISION OF SECTION 506
SOIL RIPRAP

Section 506 of the Standard Special Provision is hereby revised for this project as follows:

Section 506.02 shall include the following:

Soil riprap (12 inch) shall be a uniform mixture of **seventy percent riprap** and **thirty percent topsoil.** Riprap (12 Inch) shall be mixed or processed prior to placement to the lines and grades shown in the drawings.

Section 506.04 shall include the following:

Soil riprap (12 Inch) will be measured by the actual number of cubic yards installed and accepted.

Section 506.05 shall include the following:

Pay Item	**Pay Unit**
Soil Riprap (12 Inch)	Cubic Yard

The topsoil used in the soil riprap will not be measured and paid for separately, but shall be included in the cost of the Soil Riprap.

SECTION 513
BRIDGE DRAIN (SPECIAL)

DESCRIPTION

513.01 This work shall consist of furnishing and placing bridge scuppers (drains) and drainage pipes in accordance with the details shown on the plans and these specifications.

MATERIALS

513.02 Bridge scuppers shall be cast gray iron, ASTM A-48, Class 35B. Pipes and accessories shall meet the requirements of ASTM A53 and shall be galvanized in accordance with AASHTO M111.

CONSTRUCTION REQUIREMENTS

513.03 The scuppers shall be designed to support H25 / HS25 wheel loads. The top of the grate shall be flush with the top of the hot mix asphalt (HMA) as shown in the plans. Install the scuppers per the manufacturer's recommendations. Bridge scuppers shall be placed and secured at the locations shown on the plans prior to concrete placement.

Prior to fabrication, two sets of working drawings which comply with the requirements of Section 105 of the Standard Specifications shall be submitted the Engineer for information only. The working drawings will not be approved or returned.

METHOD OF MEASUREMENT

513.04 Bridge scuppers are to be measured by the actual number of bridge drains placed and accepted.

BASIS OF PAYMENT

513.05 The accepted quantities of bridge drains will be paid for at the contract unit price per each. Payment will be made under:

Pay Item	**Pay Unit**
Bridge Drain (Special)	Each

All costs associated with bridge drainage pipe including fittings and end treatments will not be measured and paid for separately, but shall be included in the work.

SECTION 522
DUPLEX COATING SYSTEM

Section 522 of the standard specifications is hereby added to the Standard Specifications for this project as follows:

DESCRIPTION

522.01 This work consists of hot dip galvanizing and duplex coating steel structures as shown in the Contract.

MATERIALS AND CONSTRUCTION REQUIREMENTS

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522.02

(a) *General*. The Contractor shall provide, install, and repair if necessary, all steel items that are prepared and coated in conformance with this Section. All repair and replacement of the finished coating necessary for final acceptance shall be at the Contractor's expense.

Steel products to be galvanized and coated shall be cleaned of weld spatter and bevel finished at exposed corners, edges and points. Areas having welds, cuts, bores, notches, or grooves shall also be beveled unless otherwise noted in the Contract or directed by the Engineer. Bevel work shall produce a uniform, smooth finish for galvanizing. Bevel size to be used is based on steel thickness and other criteria as follows:

Steel Thickness/Type	Bevel Size (inches)
Less than ½" thick	1/32" to 1/16"
Over ½" thick	1/16" to 1/8"
Bores, notches & grooves	root face of 1/32" to 1/16"

Welds shall be cleaned and finished according to AWS standards.

All coating measurements shall be taken with a Type 2 fixed probe Dry Film Thickness (DFT) gauge. The gauge shall be calibrated according to the Society for Protective Coatings (SSPC) Standard PA-2.

(b) *Galvanizing.* Galvanizing shall be done in accordance with the Contract requirements and AASHTO M 111 (ASTM A123) for the type of material being galvanized, except that items shall only be quenched with ambient air. The poles and arms for traffic signals and signs shall be hot dipped galvanized inside and outside. Chromate treatment of any type will not be permitted. Zinc-phosphate pretreatment or acrylic passivation pretreatments shall be as described in (d) below.

The Contractor shall submit a certificate of compliance (COC), conforming to subsection 106.12, confirming that all materials meet or exceed the galvanizing requirements described herein.

Spot areas not requiring galvanizing shall be marked and cleanly patched with material that prevents galvanization but does not weaken the adjacent spelter coating. Repair of patched areas shall be achieved by metallizing as described in (c) below.

Prior to galvanizing, the Contractor's galvanizer shall notify the Engineer in writing that the galvanized order is chromate free and air quenched. Products not certified chromate free by the Contractor's galvanizer shall be tested prior to galvanizing. The Contractor shall provide the Engineer with certification from an independent ASTM accredited laboratory listing all individual items that test chromate free. Testing shall comply with ASTM D-2092 Appendix X2. Test results shall be provided to the Engineer prior to galvanizing.

(c) *Repair of Galvanized Products.* Uncoated areas or damaged coating exceeding applicable specification limits shall be re-galvanized to meet the original specification requirements. Cuts made after galvanizing shall be ground, beveled, and smoothed before repair. Damaged galvanized areas shall be re-galvanized or metallized.

Metalizing shall conform to ASTM A-780, Annex A1 or Annex A3, except that minor repair areas shall be cleaned according to SSPC method SP-3. SSPC Method SP-2 may be used to clean difficult access areas. Thickness of the repair coat shall match adjacent galvanizing, as measured by a calibrated DFT gauge.

Coating imperfections such as burring, runs or drips, high spots, heavy dross, or ash inclusion shall be removed and cleaned at the Contractor's expense. Areas of re-work falling below zinc thickness limits shall be repaired at the Contractor's expense.

Printed Technical Data Sheets (PTDS) shall be provided to the Engineer for repair materials used.

(d) *Preparing Galvanized Surfaces for Coating.* Products shall be inspected for shipping and handling damage before surface preparation begins. Damage shall be reported to the Contractor's galvanizer and to the Engineer prior to repair. The Engineer will determine whether damaged items are to be repaired or replaced. Minor repair of galvanizing shall conform to (c) above, and shall be at the Contractor's expense.

The Contractor shall prepare each surface to be coated so that it has a slightly roughened profile without removing over 1.0 mil of the galvanized coating. Minimum ASTM zinc thickness specifications shall still apply after preparation.

Surfaces of fasteners to be coated shall be lightly brushed or sanded in a manner that will remove the least amount of zinc.

Surfaces that become soiled after pretreatment shall be cleaned prior to coating by low pressure, mild detergent wash and rinse. Stained or oiled surfaces may also be mildly scrubbed with a soft bristle nylon brush. Stubborn stains may be mildly scrubbed with a mix of 1 - 2 percent ammonia solution and thoroughly rinsed. Wash and rinse pressure shall not exceed 100 psi at 185° F temperature.

Surface preparation work shall be done according to one of the following methods:

1. *Zinc-Phosphate Pretreatment.* This treatment may be used only on new galvanizing less than 48 hours of age.

   Items shall be immersed in a bath of acidic zinc-phosphate solution for 3 - 6 minutes, rinsed with clean water, and dried. The first epoxy coat shall be applied within 48 hours after immersion treatment.

   If treated items are shipped to a different coating facility they shall be rewashed, rinsed and dried to remove surface soiling. The first epoxy coat must still be applied within 48 hours after immersion treatment.

2. *Acrylic Passivation Pretreatment.* This treatment may be used only on fresh hot galvanizing or new galvanizing less than 48 hours of age. Only chrome-free solutions shall be used, applied by a method that ensures complete coverage of all surfaces to be coated. The Contractor shall provide the Engineer with treatment dates for each item and the PTDS for the solutions used.

   The Contractor's galvanizer may apply solution to fresh hot galvanizing that is less than 6 hours of age, still clean,

and dry and that has cooled to treatment application temperature guidelines.

If newly galvanized items are shipped to another treatment facility they shall be washed, rinsed and dried to remove surface soiling. The solution shall then be applied and cured according to the supplier's instructions.

Fully cured and treated items shall be rewashed, rinsed, and dried again just before coating. Items not coated within 100 days of treatment shall be abrasive blasted in conformance with subsection (d) 3.

3. *Abrasive Blasting.* This treatment may be used on galvanized items of any age if beveling requirements as listed in the third and fourth paragraphs of subsection (a) have been met.

   The Contractor shall notify the Engineer in writing at least five working days before blasting begins. Zinc thickness shall be measured and recorded immediately after blasting and provided to the Engineer within 48 hours of blasting. Thickness limits and measurement frequency shall comply with the original applicable ASTM specification. Blast operations shall reasonably conform to ASTM Standard Practice D-6386, Subsection 5.4.1 except for small areas falling below required zinc thickness. These areas shall be repaired in accordance with subsection (c). No single area shall exceed 2 inches at its largest width or 12 inches at its longest dimension. The total repair area shall not exceed 1 percent of the coatable surface of the item; if limits are exceeded or zinc thickness is below the specification requirement, the item shall be re-galvanized in conformance with the original specification.

   The Contractor shall measure and record the size, location and repair method used for all repairs. This information shall be included on the report of thickness measurements.

   The first epoxy coat shall be applied within 90 minutes of abrasive blasting. Items shall be cleaned free of blast debris before coating. Compressed air used to clean items shall be free of oil, residue, oil and other harmful contaminants.

Thickness measurement is not required after surface preparation work has been completed.

(e) *Coating and Paint Systems.* Prepared items shall be coated with a two or three coat system described in this subsection. Alternative coating systems shall be pre-approved in writing by the Engineer. Manufacturer's PTDS for each coating type shall state test values for ASTM requirements of this subsection. Prior to product use the coating supplier shall provide the PTDS and certify to the Engineer in writing that all furnished coating materials meet applicable requirements of this subsection.

Faying surfaces shall not be painted unless written approval is given by the Engineer. All shop fabrication, including welds and attachments, shall be completed prior to coating unless otherwise specified in the Contract or directed in writing by the Engineer.

Inorganic zinc coatings shall not be used. Combined DFT of all coats applied over the galvanizing shall range from 6.5 to 10 mils with a topcoat DFT of 3 mils minimum. Dried color of the base coat and topcoat shall be visually contrasting. Finished color shall not vary more than 4 ΔE^*_{ab} units from the specified color determined in accordance with ASTM D 2244.

Volatile Organic Compound (VOC) levels shall not exceed 3.0 pounds per gallon for each applied coat. Dry films shall contain less than 1 percent lead and other toxic heavy metals. The zinc concentration of each epoxy coat shall

not exceed 40 percent. Top coats shall have a semi-gloss value of 50-75.

All coatings shall be able to withstand temperatures up to 180° F without sag, blister, or peel damage. Topcoat formulation shall provide weathering, chemical, and ultraviolet (UV) resistance. All coatings shall meet the following ASTM requirements as amended:

(1) Corrosion Weathering. ASTM D-5894, minimum 6-cycles of exposure:
Corrosion rating of 8 or higher according to ASTM D-1654.
Blistering rating of 8 or higher according to ASTM D-714.

(2) Impact Resistance. ASTM D-2794, 30 day test:
Epoxies – Minimum 40 inch-pounds
All Topcoats – Minimum 90 inch-pounds

(3) Adhesion Testing. ASTM D-4541, 30 day test, Minimum 500 psi for either: Method B - flat surface or Method E - curved surface.

(4) Abrasion Resistance. ASTM D-4060, 30 day test: Maximum 90 mg loss after 1000 cycles with a CS10 or CS17 wheel.

(5) Flexibility. ASTM D-522, 30 day test - Method B: Epoxies shall pass a 180 degree bend over a ¾ inch mandrel. All Topcoats shall pass a 180 degree bend over a 3/8 inch mandrel.

Each coat shall be applied uniformly to provide an appearance free of laps, streaks, sags, drips, pinholes, and other discontinuities; all such defects shall be repaired prior to product shipment.

The Contractor's coater shall measure the DFT of each applied coat according to SSPC, Guide PA-2, except that measurements shall be taken with a calibrated Type 2 fixed probe gauge. Thickness records shall be provided to the Engineer prior to project shipment. The following two coating systems do not require pre-approval:

1. Powder Coating. The Contractor's coater shall oven preheat the articles to abate out-gassing potential. The Contractor's coater shall use compatible materials and coating processes to obtain proper coat to coat adhesion.

   The epoxy powder base coat shall measure 2 to 6 mils DFT and be applied by electrostatic or airstatic spray. The powder formulation shall be a non-hybrid epoxy of anti-gassing grade.

   The powder topcoat shall be electrostatic or airstatic spray applied and measure 3 to 6 mils DFT. The powder formulation shall be a non-acrylic, high-build, aliphatic-based, enhanced polyester or urethane polyester of anti-gassing grade.

   Liquid Coating. The Contractor's coater shall apply coats by conventional or airless spray according to the supplier's guidelines. Minimal striping at difficult work areas is permissible. The Contractor's Coater shall use proper work methods and compatible materials to obtain proper coat adhesion. Thinning of paints shall be done according to the manufacturer's instructions so that thinned products conform to the solids content and VOC limits of this subsection.

The epoxy base coat shall measure 2 to 6 mils DFT. Paint shall be a low-blush epoxy polyamide, or a low-blush

cycloaliphatic bisphenol-A polyamine. Minimum solids by weight of all epoxies used shall be 68 percent. The topcoat shall measure 3 to 6 mils DFT. Paint shall be an aliphatic-based urethane polyester or aliphatic-based polyurea urethane. Specially formulated aliphatic-based polyaspartic polyureas may also be used over compatible epoxy bases.

(f) *Repair of Coated Products.* The Contractor shall repair damage from shipment, installation, field welding, or other activity during the construction. Damage shall be reported to the Engineer prior to repair. Repairs shall be as directed by the Engineer.

Significant repair procedures require written submittal of a proposed repair process from the Contractor. The Engineer shall approve the proposal in writing before repairs begin. Significant repairs are classified as:

(1) Any damaged area to the base coat material over 1 square inch
(2) Total repair areas exceeding 5 percent of the coating per item
(3) Any single topcoat repair area over 64 square inches

Minor and touchup repair of topcoats shall be done as follows:

A UV rated, aliphatic-based liquid topcoat paint shall be used. The paint shall be compatible with the existing topcoat material and closely match existing color. The paint shall meet the requirements of subsection (e). The paint supplier shall provide the Engineer with PTDS for the products used.

Single areas smaller than 8 square inches requiring repair shall be scuffed with 220 grit sandpaper or equivalent scuff material. Larger areas up to 64 square inches may be cleaned according to SSPC, Method SP-2. All border areas at the undamaged topcoat shall be scuffed with 220 grit material.

Cleaned, scuffed areas shall be bordered and coated by airless or conventional spray. Work areas shall be adequately shielded to contain errant spray. Fresh repair areas shall be protected as necessary during the initial cure. Repair thickness shall reasonably match the adjacent coating.

The repair coat shall provide an appearance free of sags, runs, streaks, drips, pinholes, or other discontinuities. Spray can paint repair shall not be used**.**

(g) *Conditions for Final Acceptance of Coating.* Within six weeks immediately prior to final project acceptance, the Engineer and a representative of CDOT's Staff Bridge Branch will conduct a final inspection of the coating. The Contractor's Superintendent shall also attend the inspection. Before final project acceptance, the Contractor shall repair the following defects found during the inspection:

a. Peeling on any portion of the coatings.
b. Blistering on any portion of the coatings.
c. Color fading below a 35 gloss rating, in accordance with ASTM D523.
d. Mottling defects that exceed 3 percent of the topcoat surface.

e. Visible cracking of the topcoat material.
f. Visible rusting discoloration on the coating.
g. Sag or other evidence of coating adhesion loss.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Duplex Coating System will not be measured and paid for separately, but shall be included in the work.

REVISION OF SECTION 603
PIPE HANGERS
(Revised 1/24/2017)

Section 603 of the Standard Specifications is hereby revised for this project to include the following:

Subsection 603.01 shall include the following:

This work consists of materials, equipment, and labor to design, detail, apply protective coating, and install hangers for the proposed sewer line on the Overflow and Main Channel Bridges, and for the bridge drainage pipe on the Overflow Bridge.

Subsection 603.02 shall include the following:

Materials and equipment used to install and fabricate hangers shall be furnished by the Contractor. The steel at the Main Channel bridge (Str. No. BP-MC) shall be duplex coated with a Federal Standard 595C color number 30145.

Subsection 603.03 shall include the following:

The Contractor shall design and detail hangers to support the 10-inch Plastic Sewer line along with the 16-inch Welded Steel Pipe encasement pipe that will be carried across the Overflow and Main Channel bridges, and the 8-inch bridge drain pipe that will be carried across a portion of the Overflow bridge. The design and detailing of the hanger system shall be submitted to the Engineer for approval prior to fabrication. The Engineer shall have 10 working days to review the submittal. The submittal shall be stamped by a registered engineer in the State of Colorado.

603.03.1: Overflow Bridge (Str. No. BP-OF)

The sewer line, bridge drainage pipe, and associated hangers shall be located between girders 4 and 5. Refer to the utility and civil plans for the exact horizontal and vertical locations. The hangers shall connect to the bridge deck. A threaded insert shall be cast into the bridge deck based on the approved plans.

603.03.2: Main Channel Bridge (Str. No. BP-MC)

The sewer line shall be hung from girder 8 on the south side of the bridge. The hanger inserts shall be installed by the box beam precasting company. The insert locations shall be coordinated by the Contractor. Refer to the sewer layout in the utility plans for the exact horizontal and vertical locations.

Subsection 603.12 shall include the following:

Pipe hangers will not be measured and paid for separately, but shall be included in the work.

REVISION OF SECTION 604
INLET SPECIAL (PVC PIPE STOCK)

DESCRIPTION

This work consists of furnishing and installing Inlet Special (PVC Pipe stock) in accordance with these specifications and in conformity with the lines and details shown on the plans.

MATERIAL

The Inlet Special (PVC pipe Stock) shall be manufactured by one of the following companies or an approved equal.

- Nyloplast, Buford GA 30518, Phone (866) 888-8479
- Specified Fittings, LLC, Stevensville MT 59870, Phone (406) 777-3466
- Harrington Corporation/HARCO fittings, Lynchburg VA 24501, Phone (800) 825-7094

The drain basin shall be manufactured from PVC pipe stock, utilizing a thermo-molding process to reform the pipe stock to the specified configuration.

The drain basin shall be traffic rated as H-20 or higher.

The maximum interior basin diameter will be 12 inches.

Ductile Iron Frame and Grate, capable of supporting H-20 wheel loading. The metal used for the grates and frame shall conform to ASTM A536 grade. The ductile iron frame and grate is to be considered an integral part of the surface drainage inlet. The grates will have a locking device. The grate will be hinged to allow for easy access.

Drainage Pipe Connection stubs shall provide a watertight connection with the specified pipe system. The joint tightness shall conform to ASTM D3212 for joints for drain and sewer plastic pipe using flexible elastomeric seals. The flexible elastomeric seals shall conform to ASTM F447. The pipe bell spigot shall be joined to the main body of the structure. The raw material used to manufacture the main body and the pipe stubs of the subsurface drainage inlets shall conform to ASTM D1784 cell class 12454.

The required drainage pipe to be used with these inlets will be 8 inch PVC C900, SDR 35.

The final design and product specifications for this system will be approved by the engineer.

The Ductile Iron Grate and Frame will be subject to the Federal ‘Buy America Requirements’ as designated Section 106.11 of the Standard Specifications.

CONSTRUCTION REQUIREMENTS

The Inlet (PVC Pipe Stock) will be placed per the manufacturer’s recommendations and requirements.

REVISION OF SECTION 604
INLET SPECIAL (PVC PIPE STOCK)

METHOD OF MEASUREMENT

Inlet Special (PVC Pipe Stock) will be measured by the actual number that are installed and accepted.

BASIS OF PAYMENT

The accepted quantities of Inlet Special (PVC Pipe Stock) will be paid for at the contract unit price for the pay item listed below. Payment will be made under:

Pay Item	**Pay Unit**
Inlet Special (PVC Pipe Stock)	Each

Payment will be full compensation for all work and materials, required to furnish, install, and certify the Inlet Special (PVC Pipe Stock).

REVISION OF SECTION 613
ILLUMINATED BOLLARD

Section 613 of the Standard Specifications is hereby revised for this project to include the following:

DESCRIPTION

This work consists of furnishing and installing Illuminated Bollard and base. This work shall be done in accordance with these specifications and in conformity with the lines and details shown on the plans or established.

MATERIALS

The Illuminated Bollard shall be one of the following or an approved equal:

- Concrete Bollards models either Washington or the Sheridan, as manufactured by Stresscrete Group, 14503 Wallick Road, Atchison, Kansas 66002, phones (913) 255-3112 or 1-800-837-1024
- Stonegate Bollard, model EDS-2 or model EDS-3A, with the 45 degree Cutoff Grill. As manufactured by Unique Lighting Systems, Phone (720) 939-1198
- Deerfield Concrete Bollard w/LED Light Fixture Included (TF6095), as manufactured by Wausau Tile Inc., P.O. Box 1520, Wausau, WI 54402-1520, Phones (715) 359-3121 or 1-800-388-8728

The intent of the bollards is to safely delineate the Shared Use path under the bridges. The Lighting of the roadway and trail shall be designed such that light throw avoids or is minimized within, adjacent open water, wetlands, or Southwestern Willow Flycatcher nesting habitat. To accomplish this, the bollard shall have the ability for 180 degrees light block out for the light getting directed toward the river.

Lighting for the proposed trail below the main channel bridge shall be limited to the fewest luminaires and lowest wattage possible to meet minimum safety standards to minimize effects to possible river otter movement below structure.

Additional requirements are the Bollard be built of durable materials such as a concrete or a concrete equivalent.

CONSTRUCTION REQUIREMENTS

The bollards will be placed per the manufacturer’s recommendations and requirements.

METHOD OF MEASUREMENT

Illuminated Bollards will be measured by the actual number of attenuators that are installed and accepted.

BASIS OF PAYMENT

The accepted quantities of Illuminated Bollards will be paid for at the contract unit price for the pay item listed below. Payment will be made under:

Pay Item	**Pay Unit**
Illuminated Bollard and Base	Each

Payment will be full compensation for all work and materials, required to furnish, install, and certify the Illuminated Bollard and Base.

REVISION OF SECTION 622
TEMPORARY SEWAGE BYPASS SYSTEM
(Revised 1/24/2017)

Section 622 of the Standard Specifications and Supplemental Specifications is hereby revised for this project as follows:

Remove and replace Subsection 622.25 with the following:

SCOPE

During various phases of the Work, it will be necessary to construct and maintain temporary bypass sewers to maintain continuous and reliable wastewater flow in the Town system. The Bridge replacements will require that gravity sewer system will be out of service for a prolonged period. The Contractor shall construct a temporary bypass sewer that shall discharge into the original piping downstream of the affected area.

The Town will provide some plan details and a list of materials and equipment that the Town will provide. The Town has purchased pumps and related accessories including guide rails, mounting bases, float switches and control panel. The Town will provide check and isolation valves for each pump. The Town will provide electrical service at the vault's location at station 300+75 right.

The Contractor shall furnish the all labor, materials, equipment, and incidentals required to install the temporary sewage bypass system for the duration of construction. The Contractor shall furnish and install pipe, fittings, unistrut frame for mounting the control panel, conduit, manhole vault and hatch. The Engineer will provide details for the vault to the Contractor.

Information critical to the design of the temporary bypass system are as follows:

- The sewer line is primarily fed by the Gem Village lift station. The pump rates on the lift station are typically in the 110 to 140 Gallons per minute range.
- The pump time is approximately 20 minutes each cycle. Historic Pump time averages per day are 110 minutes per Day in the Winter and 220 minutes per day in the summer
- The existing layout of the existing sewer manholes is available for review

SUBMITTALS

The Contractor shall submit to the Engineer a schedule to complete the Work. It will include the sequencing and coordination of connections to existing sewers, pipeline inspection, trenchless rehabilitation and testing of existing sewers, and the handling of wastewater flow during construction. The schedule of work shall also be reviewed and approved by the Engineer and Town of Bayfield.

The Contractor shall prepare a specific, detailed description of the proposed pumping system (Bypass Pumping Plan). The Bypass Pumping Plan shall be submitted and approved prior to the mobilization of any of the equipment included in the Bypass Pumping Plan. The Bypass Pumping Plan shall outline all provisions and precautions to be taken by the Contractor regarding handling of existing wastewater flows. This Bypass Pumping Plan must be specific and complete, including such items as schedules, locations, elevations, capacities of equipment, materials, and all other incidental items necessary and/or required to ensure proper protection of the facilities, including protection of the access and bypass pumping locations for damage due to the discharge flows, and compliance with the requirements and permit conditions specified herein. No Construction shall begin until all provisions and requirements have been reviewed and accepted by the Engineer and Town of Bayfield. The plan shall include but not limited to the following details:

1. Staging areas for pumps.
2. Sewer plugging method and types of plugs.
3. Size and location of manholes or access points for suction and discharge hose or piping.
4. Number, size, material, location and method of installation of suction piping.
5. Bypass pump sizes, capacities, and number of each size to be provided onsite including all primary, secondary, and spare pumping units.
6. Calculations of static lift, friction losses, and flow velocity (pump curves showing pump, operating range shall be submitted).
7. Downstream discharge plan.
8. Method of protecting discharge manholes or structures from erosion and damage.
9. Thrust and restraint block sizes and locations. Provide the details necessary to demonstrate the integrity of all suction and discharge piping including piping and fittings associated with all primary and secondary pumping units.
10. Sections showing suction and discharge pipe depth, embedment, select fill and special backfill.
11. Method of noise control for each pump and any additional equipment that is included in the Bypass Pumping Plan.
12. Any temporary pipe supports and anchoring requirements.
13. Access plans to all bypass pumping locations
14. Calculations for selection of bypass pumping pipe size.
15. Schedule for installation of and maintenance of bypass pumping lines.
16. Plan indicating location of bypass pumping pipe locations.
17. Emergency plan for adverse weather and flooding for various phases of the Work.

EXECUTION

The Town shall supply pumps, valves, power, and other equipment to divert the flow of sewage around the section in which Work is to be performed.

All bypass pumping piping shall conform to the Town of Bayfield's Sanitary Sewer Collection System requirements in the Construction Specifications document revised on November 6, 2012 for PVC pressure Pipe. This document is available for review per the 'Project Plans and Other Data' project Special Provision. It is also available online.

The Contractor shall perform leakage and pressure tests of the bypass pumping discharge piping using clean water prior to the actual operation. The pressure and leakage test shall be conducted at one-and-a-half times the maximum pressure the system will experience based on the approved Bypass Pumping Plan for a period of two hours. No leakage is permitted during this test. The Engineer will be given 24 hours notice prior to testing. In addition, the Contractor shall demonstrate that pumping system is in good working order and is sufficiently sized to successfully handle flows by performing a test run for a period of 24 hours prior to beginning the Work.

Each bypass pumping operation shall include the components and systems to accomplish the bypass in accordance with these Specifications and the Special Project Conditions.

The Town shall provide on-site manual oversight of all bypass pumping operations 24 hours per day, 7 days per week when the bypass pumping system is in operation.

REVISION OF SECTION 622
TEMPORARY SEWAGE BYPASS SYSTEM
(Revised 1/24/2017)

The Contractor shall be required to repair, at his own expense, any damage to public or private property caused by his operations.

Should damage of any kind occur to the existing sewers, the Contractor shall, at his own expense make repairs to the satisfaction of the Engineer and the Town of Bayfield.

The Contractor shall immediately notify the Town of Bayfield and the Engineer should a sanitary sewer overflow (SSO) occur and take the necessary action to clean up and disinfect the spillage to the satisfaction of the Authority and/or other governmental agency. If sewage is spilled onto public or private property, the Contractor and Town shall wash down, clean up, and disinfect the spillage to the satisfaction of the property owner, Authority, and/or other governmental agency.

The Contractor shall not be permitted to overflow, bypass, pump or by any other means convey drainage to any land, street, storm drain or water course.

The Contractor shall cease bypass pumping operations and return flows to the new and/or existing sewer when directed by the Owner. During bypassing, no wastewater shall be leaked, dumped, or spilled in or onto any area outside the existing wastewater system. When bypass operations are complete, all bypass piping shall be flushed with fresh water and drained into the wastewater system prior to disassembly.

Contractor must take care to prevent damage to existing structures. Discharge piping to gravity sewer systems shall be designed in such a manner as to prevent discharge from contacting manhole walls or benching and full discharge shall go into downstream pipe with as minimal turbulence as possible. Contractor is responsible for any damage to manholes. It may be necessary to remove the manhole cone to provide sufficient space for the bypass piping. If this is required, the Contractor shall be responsible for any damage to existing manhole components.

The Contractor shall establish adequate bypass pumping adherent to the conditions above and anticipate severe weather conditions and increases in peak flows during rain events.

The 24-hour monitoring person shall be properly trained, experienced, and mechanically qualified such that they can quickly and effectively address any potential emergency and non-emergency situations associated with the pumps and bypass pumping system that must remain in operation for an extended period.

Subsection 622.27 shall include the following:

Payment for this work will be made via the planned Force Account pay item “Temporary Sewer Bypass System”

REVISION OF SECTION 626
PUBLIC INFORMATION SERVICES
(TIER IV)

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

DESCRIPTION

This work consists of providing regular and continuous public information services throughout the duration of the project. Final approval of approach and collateral will be given by the Engineer with review by Town Manager. Anticipated communications issues on this project include:

(1) Notification of bridge closure and alternative routes.

CONSTRUCTION REQUIREMENTS

(a) *Public Information Manager (PIM)*. The Contractor shall provide a full-time Public Information Manager (PIM) who will be the responsible charge for all activities associated with public information services. As part of the key project staff submittal prior to the Preconstruction Conference, the Contractor shall submit the name, contact information and qualifications of the Public Information Manager (PIM) for this project for approval by the Engineer. The PIM's Public Information Manager (PIM) may be the superintendent if approved by the Engineer after consulting with the Town Manager, or he or she may be another approved project staff person. The PIM shall have good verbal and written communications skills. The Engineer will coordinate all aspects of the PIM's work, including all required submittals, with the Town Manager (TM).

(b) *Activities of the PIM*. Throughout the duration of the project, the PIM shall be responsible for the following:

(1) *On Call*. The PIM shall be available or on call on every day there is work on the project and available upon the Engineer's request at other than normal working hours.

(2) *Public Information Line/Communications*. The PIM shall establish a public information office equipped with a telephone, voicemail, computer and email address. The public information office may be located off-site or within the PIM's field office, provided that the telephone line is a local call line. The voicemail greeting for the project information line shall provide an updated message each week, or each day if necessary, concerning the project's completion date and forthcoming activities on the project and allow the recording of a message from the caller. If unable to answer the public information line, the PIM shall check and respond to voicemail messages throughout each day of construction operations and/or lane closures. The PIM shall track inquiries made by citizens and businesses, including names, addresses, phone numbers, and subsequent action taken during construction; these customer inquiries and follow-up action shall be documented. A written summary of inquiries and follow up shall be provided to the Engineer and Town Manager each week. All inquiries and complaints shall be followed up with a return phone call or email from either the PIM and, when necessary, the Engineer or Town Manager.

(3) *Photos/Video.* The PIM shall take and submit photos/videos of the project work on regular intervals. A cell phone camera is permitted. Photographs/videos may include traffic control, paving, slope repair, erosion control, bridge deck and rail work, and other key areas of work identified by the Contractor, Engineer and Town Manager for use in reports to interested agencies, social media, and flyers. A minimum of two digital photographs/videos shall be submitted each month to the Engineer.

(4) *Media Relations.* At least two weeks prior to the project start date, the PIM shall prepare a media release summarizing the project scope, construction phasing, potential traffic and construction, duration of project and summary of project benefits. The PIM shall develop additional media releases and traffic advisories based on major construction milestones such as major traffic shifts, key closures, etc. or as requested by the Town. The media releases and traffic advisories will be sent to the Engineer and Town Manager following the Deliverables Table 626-2. Town will distribute media releases, traffic advisories and other information.

The PIM shall immediately notify the Engineer of any on-site situations involving the media. Should media call, the PIM will provide only the Town Manager's contact information. The Town will address all media inquiries and media requests.

(5) *Lane Closure Reports.* The PIM shall submit a Lane Closure Report each Thursday, for the following week's activities (Saturday through Friday), to the Engineer.

(6) *Project Fliers.* At least 10 working days prior to the start of work, the PIM shall prepare up to 50 fliers and deliver one flier to each property owner potentially impacted by the highway work zone with access to Bayfield Parkway. The Town shall provide a list of potentially impacted property owners. An email containing the flier shall also be sent to the Public Information Contacts identified in 626 (g). Up to 25 additional fliers may be required, as directed without additional compensation. Fliers may be delivered via http://uspseverydoordirectmail.com, the use of a mailing list from county GIS mapping, or other approved method.

The flier shall provide the anticipated project start and end date, location and description of work, traffic impacts and hours/days of operation, PIM's project information line, email address, web address, project map (if necessary) and a construction safety message as defined by the Town. Flier may also contain contractor logo, if desired. Fliers shall be submitted for approval in accordance with Table 626-2. Final approval is provided by the Engineer.

(7) *Language Assistance for LEP Persons.* The Town is required to provide access to Limited English Proficient (LEP) persons. LEP persons are individuals for whom English is not their primary language and who have a limited ability to read, write, speak or understand English. Examples of language

assistance include, but are not limited to, translation of meeting notices and interpretation services at meetings. At a minimum, the PIM shall work with Town to provide interpretation services upon request by an LEP person. Additionally, if the community to which the project flyers shall be distributed has greater than 5 percent LEP persons, the flyers shall be translated. The PIM shall document all measures taken to communicate with LEP persons and record all requests for language assistance.

(c) *Construction Signing.* In accordance with Section 630, a minimum of two weeks prior to start of work, the Contractor shall erect signs at both ends of the project limits, with the estimated dates when the project will commence and end. The signs shall include the Contractor's name and public information contact number.

(d) *Response Protocol to Town and the Public.* The PIM shall conform to Table 626-1 in responding to correspondence from stakeholders and the public:

Table 626-1
RESPONSE PROTOCOL

TYPE OF COMMUNICTION	TIMING OF RESPONSE
Hotline Calls	Check messages throughout day Respond same day (initial call) or within 24 hours (including weekends if work is occurring)
Email	Same day (within two business days for high volume situations)
Call from Town Staff or Engineer	As soon as possible
Webpage Inquiries	Same day (within two business days for high volume situations)
Public Meeting Inquires	Within one week of the meeting

(e) *Deliverables Protocol to Town.* The PIM shall conform to Table 626-2 in submitting the following for Department review and approval prior to dissemination:

REVISION OF SECTION 626
PUBLIC INFORMATION SERVICES
(TIER IV)

Table 626-2
DELIVERABLES AND SUBMITTAL TIME TO CDOT ENGINEER

Deliverable	When to be submitted
PIM Name and Credentials	Before Pre-Construction Meeting (along with key staff submittal)
PIM Contact Information	At Pre-Construction Meeting
Emergency Response Telephone Tree (when required in the Contract)	Before works starts
Local Telephone Hotline	Before works starts
Stakeholder Distribution List (if required for non-work zone flyer recipients and emergency service providers)	At Pre-Construction Meeting
Lane Closure Reports	Weekly, on Thursday by noon
Traffic Advisories/Media Releases	48 hours prior to scheduled distribution date
Fliers, posters or other public material	5 Working Days prior to the scheduled distribution date In cases of rapid response, 48 hours prior to distribution
Photos/Video	Two a month or as requested.

(f) *Deliverable protocols to the Public.* The PIM shall conform to Table 626-3 in providing the following information to the public:

Table 626-3
DELIVERABLES AND SUBMITTAL TIME TO THE PUBLIC

Deliverable	When to be published
Full road closures, detours, and major traffic impacts lasting seven days or longer	14 days prior to the beginning of activity in any area of the Project.
Major project activities (such as major lane shifts, bridge demolitions, etc.) lasting seven days or less	7 days prior to the beginning of the activity
Other remaining types of construction Activities in any area of the Project including: ▪ Night Work ▪ Utilities ▪ Change of business/residential access	7 days prior to the beginning of activity in any area of the Project or as determined jointly by teams
Other construction updates (e.g., cancellation of planned closures, additional lane closures, closure removals, major traffic shifts, etc.) that directly impact the public.	As soon as known with at least 24 hours' notice

(g) *Public Information Contact Sheet.* A Public Information Contact Sheet is listed below. Public Information Contacts may be updated at the discretion of the Town and up to ten (10) additional contacts may be added to the Public Information Contacts list after preconstruction meeting without additional compensation.

-6-

REVISION OF SECTION 626
PUBLIC INFORMATION SERVICES
(TIER IV)

Public Information Services Contact Sheet

Town of Bayfield
Chris La May, Town Manager
PO Box 80, 1199 Bayfield Parkway
Bayfield, CO 81122
Phone: (970) 884-9544
Email: clamay@bayfieldgov.org

Owner Representative (Engineer)
Name: Richard Bechtolt
Address: 3059 Main Ave Ste A
Durango, CO 81301
Phone: (970) 759-1863
Email: tbemelen@bechtolt.com

CDOT Representative
Name: Robert Shanks
Address: 3803 North Main Avenue, Suite 100
Durango, CO 81301
Phone: (970) 385 - 8361
Email: Robert.shanks@state.co.us

Town Web Site Administrator
Kathy Cathcart, Town Clerk
PO Box 80, 1199 Bayfield Parkway
Bayfield, CO 81122
Phone: (970) 884-9544
Email: kcathcart@bayfieldgov.org

Town Facebook Administrator
Erin Dunavant, Finance Director
PO Box 80, 1199 Bayfield Parkway
Bayfield, CO 81122
Phone: (970) 884-9544
Email: edunavant@bayfieldgov.org

Town Public Works
Ron Saba, Public Works Director
PO Box 80, 1199 Bayfield Parkway
Bayfield, CO 81122
Phone: (970) 884-9544
Email: rsaba@bayfieldgov.org

Police Department
Joe McIntyre, Town Marshal
PO Box 80, 1199 Bayfield Parkway
Bayfield, CO 81122
Phone (970) 884-9636
Email: jmcintyre@bayfieldgov.org

REVISION OF SECTION 626
PUBLIC INFORMATION SERVICES
(TIER IV)
Public Information Services Contact Sheet (Continued)

Fire/Rescue/Ambulance
Bruce Evans, Chief
Upper Pine Fire Protection District
515 Sower Drive
Bayfield, CO 81122
(970) 884-9508
Email: bevans@upperpinefpd.org

Roy Vreeland, Deputy Chief
Upper Pine Fire Protection District
515 Sower Drive
Bayfield, CO 81122
(970) 884-9508
Email: rvreeland@upperpinefpd.org

County Sheriff's Office
Central Dispatch, 970-385-2900

Key Stakeholders (as appropriate)

School District
Jeff Whitmore, Director of Transportation
Bayfield School District 10-Jtr
24 Clover Drive
Phone: (970) 884-2496 ext. 4006
Email: jswhitmore@bayfield.k12.co.us

Pine River Senior Center
Brenda Jones, Senior Center Coordinator
PO Box 80, 111 S. West St.
Bayfield, CO 81122
Phone: (970) 884-7342
Email: bjones@bayfieldgov.org

Utility Owners
Black Hills Energy
(970) 946-7067
Email: TBD

La Plata Electric Association
PO Box 2750
Durango, CO 81302
(970) 382-7189
Email: TBD

CenturyLink
(970) 385-0015
Email: TBD

-8-

REVISION OF SECTION 626
PUBLIC INFORMATION SERVICES
(TIER IV)

METHOD OF MEASUREMENT

The Engineer will monitor the PIM and all public information services. When the PIM provides acceptable public information services in accordance with these specifications, partial payments for the pay item Public Information Services will be made as the work progresses. Failure to provide acceptable public information services will result in withholding of payment for this item. These partial payments will be made as follows:

Partial payments for public information services will be made once each month as work progresses. The monthly partial payments will be determined by pro-rating the lump sum bid amount by the number of months in the actual construction schedule.

BASIS OF PAYMENT

Payment will be made under:

Pay Item	**Pay Unit**
Public Information Services (Tier IV)	Lump Sum

Payment for Public Information Services will be full compensation for all work, materials and equipment to provide public information throughout the project in accordance with this specification.

Construction Signs will be measured and paid for in accordance with Section 630.

SPECIAL CONSTRUCTION REQUIREMENTS – GENERAL
(Section 404 Permit, CDOW SB 40, and CDPHE Discharge Permit)

The proposed work as shown on the plans has been permitted by the U.S. Army Corps of Engineers under a Section 404 Nationwide Permit #14 – Linear Transportation Projects. The Contractor must comply with all special and general conditions attached to the permit. All costs for permit compliance will be included in the cost of the work. Any questions regarding this permit should be directed to the U.S. Army Corps of Engineers, Sacramento 799 East 3rd Street, #2 Durango, CO 81301, (970) 375-9452, Attention: Ms. Kara Hellige.

The Colorado Department of Transportation has obtained wildlife certification from the Colorado Division of Wildlife (CDOW) for work on this project, subject to the Memorandum of Agreement between the Colorado Division of Wildlife and the Colorado Department of Transportation under Senate Bill 40 (SB 40). All General and Special Conditions of the agreement shall be adhered to by the Contractor.

The Town of Bayfield has not obtained a discharge permit (402 Permit) from the Colorado Department of Public Health and Environment (CDPHE). Therefore, water from pumping activities cannot be placed directly back into the adjacent surface water without additional permitting. If the Contractor's operations require pumping and discharge of water, they will be required to obtain the appropriate permits and develop a plan for managing that water. This plan must have written approval from the CDPHE and the Engineer before pumping operations can begin.

Copies of the SB 40 General and Special Conditions and the Section 404 Permit and Authorization are available from the CDOT Project Office or the Resident Engineer.

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.	$ 250,000*****
F/A On the Job Trainee	Hour	640
F/A Quality Incentive Payment	F.A.	$ 12,500
F/A Fuel Cost Adjustment	F.A.	$ 5,000
F/A Asphalt Cement Cost Adjustment	F.A.	$ 7,000
F/A Utility Resets	F.A.	$ 25,000
F/A Environmental, Health and Safety Management Disposals Items	F.A.	$ 5,000
F/A Erosion Control	F.A.	$ 10,000
F/A Temporary Sewer Bypass System	F.A.	$ 50,000*
F/A Roadway and Bridges Open to Traffic	F.A.	$ 40,000

TRAFFIC CONTROL PLAN - GENERAL

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

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

(1) Subsection 104.04 and Section 630 of the specifications.
(2) Standard Plan S-630-1, Traffic Controls for Highway Construction, Case 20 and Standard Plan S-630-2.
(3) Schedule of Construction Traffic Control Devices.
(4) Signing Plans.

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

CDOT may have entered into operating agreements with one or more law enforcement organizations for cooperative activities. Under such agreements, at the sole discretion of CDOT, law enforcement personnel may enter the work zone for enforcement purposes and may participate in the Contractor's traffic control activities. The responsibility under the Contract for all traffic control resides with the Contractor and any such participation by law enforcement personnel in Contractor traffic control activities will be referenced in either the Special Provisions or General Notes of the plans depending on whether the Contractor is to hire local law enforcement or if CDOT is contracting with Colorado State Patrol for uniformed traffic control. Nothing in this Contract is intended to create an entitlement, on the part of the Contractor, to the services or participation of the law enforcement organization.

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

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

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

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

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

UTILITIES

Known utilities within the limits of this project are:

UTILITY	CONTACT/EMAIL	PHONE/FAX/CELL
Centurylink 175 4th St. Pagosa Springs, CO 81147	Kirby Bryant Kirby.byant@centurylink.com	(970) 259-0511 (970) 426-0511 (cell)
La Plata Electric (LPEA) 45 Stewart Durango, CO 81303	Tiffany quimby Tquimby@lpea.coop	(970) 382-3555
Town of Bayfield Public Works (Sanitary Sewer) 905 Community Lane Bayfield, CO 81122	Ron Saba rsaba@bayfieldgov.org	(970) 884-9685
Black Hills Energy 520 Cloman Blvd. Pagosa Springs, CO 81147	Scott Hunter Charles.Hunter@blackhillscorp.com Paul Ficklin Paul.Ficklin@blackhillscorp.com	(970) 596-1924 (cell) (970) 596-1122 (cell)
Morrison Consolidated Ditch 7170 Hwy 172 81137	Mike Gomez	(970) 563-4406
CDOT – Region 5 Traffic 3803 N. Main Durango, CO 81301	Sam Sanders Sam.Sanders@state.co.us	(970) 759-5315 (cell)

The work described in these plans and specifications requires coordination between the Contractor and the utility companies in accordance with subsection 105.11 in conducting their respective operations as necessary to complete the utility work with minimum delay to the project.

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

FOR:

All Utility Companies

The Contractor will contact each utility company a minimum of two (2) business days, unless otherwise noted, prior to working in the utility company's area so that the utility company can provide an inspector and/or complete any necessary adjustments or relocations.

If a need for utility work by either the Contractor or a Utility Company arises, the following shall apply:

The Contractor shall be responsible for coordinating the adjustment of utilities on this project. The Contractor shall keep each utility company advised of any work being performed in the vicinity of their facilities so that each utility

company can coordinate any needed locates, adjustments or inspections. The Contractor shall provide the appropriate utility company ample notice, but not less than two (2) working days, prior to commencing activities in the vicinity of their facilities. If needed, or as directed by the Project Engineer, the Contractor shall provide traffic control for utility work to be coordinated with the project's construction, in accordance with an approved Method of Handling Traffic (MHT). Any additional work performed by the Contractor on behalf of the impacted utility company shall not be paid for by the State, but shall be paid by the utility company requiring the work, unless otherwise provided herein, or agreed to in writing by the Project Engineer.

This project will require coordination with utilities as part of the work. The Contractor shall be responsible for potholing and verifying the location of all utilities in close proximity to any required work in advance for the purpose of identifying conflicts not otherwise addressed in the plans and specifications as well as for the purpose of determining the extent of the conflict, and whether relocation or adjustment is required. This work will be paid for by contract bid item – Potholing. The Contractor shall share its potholing information with the impacted utilities in advance so that the utilities can coordinate the relocation work and accommodate the Contractor's work schedule. To the extent practicable, the Contractor shall be required to work around and protect existing utilities in place for the purpose of maintaining service. Close coordination with the utility owners will be required in making a determination of whether or not existing facilities can be protected in place. Damage to existing utilities resulting from construction operations wherein the utility has elected to leave its facility in place and the Contractor has expressed concern over protecting the same in place shall be the utility owners responsibility. The Contractor shall be responsible for coordinating the relocation work with the impacted utility. Any required relocation work will be performed by the impacted utility at no cost to the project unless otherwise specified herein or directed by the Project Engineer.

Insofar as no utilities were located or included in the plan sheets for the Joe Stephenson Park or the wetland mitigation area, the Contractor shall be responsible for locating all utilities in close proximity to any required work in those areas in advance for the purpose of identifying conflicts not shown in the plans. The Contractor shall be responsible for coordinating any required relocation work.

CenturyLink

Centurylink will relocate its facilities to avoid construction conflicts as shown in the plans or otherwise directed by the Project Engineer. Insofar as the relocation completion date is currently unknown, this work will occur concurrent with project construction thereby creating restrictions on the Contractor's work progress. It is estimated that this work could take approximately **8 working days** to complete and the contractor shall take the following work restrictions into account when bidding this project as it will impact the Contractor's ability to complete its work. Close coordination will be required as part of this project and the Contractor shall schedule its construction activities accordingly in order to facilitate this work. This work will be performed by Centurylink crews at no cost to the project. The Contractor shall be responsible for coordinating this work.

Town of Bayfield

All work on the Town's facilities shall be in accordance with the Town's Standard Specifications (available online at: www.bayfieldgov.org) or as otherwise shown in the plans or directed by the project engineer. The Contractor shall schedule a pre-construction conference with the Town of Bayfield a minimum of 10 days prior to commencing work on the Town's facilities for the purpose of familiarizing the Contractor with the Town's Codes and Standards as well as establishing work schedules acceptable to both parties. The Contractor will be responsible for coordinating the necessary testing and inspections with the Town and shall coordinate a final inspection prior to final acceptance and approval of the work.

UTILITIES

Town of Bayfield (Fiber Optics)

The Contractor will be required to coordinate with the Town to adjust its fiber optic line as shown in the plans or otherwise directed by the project engineer. Insofar as the relocation completion date is currently unknown, this work will occur concurrent with project construction thereby creating restrictions on the Contractor's work progress. It is estimated that this work could take approximately **5 working days** to complete and the Contractor shall take the following work restrictions into account when bidding this project as it will impact the Contractor's ability to complete its work. Close coordination will be required as part of this project and the Contractor shall schedule its construction activities accordingly in order to facilitate this work. This work will be performed by the Town's IT subcontractor and paid for in accordance with subsection 109.04(e) Administrative Compensation under a planned Force Account – utilities. The Contractor shall be responsible for coordinating and paying for this work.

Town of Bayfield (Irrigation)

The contractor shall coordinate project phasing with the Town of Bayfield Public Works Department to relocate the existing sprinkler controller box (approximate station 40+80 of the City Hall Extension of the Shared Use Path). Insofar as the relocation completion date is currently unknown, this work will occur concurrent with project construction thereby creating restrictions on the Contractor's work progress. It is estimated that this work could take approximately **5 working days** to complete and the Contractor shall take the following work restrictions into account when bidding this project as it will impact the Contractor's ability to complete its work. Close coordination will be required as part of this project and the Contractor shall schedule its construction activities accordingly in order to facilitate this work. This work will be performed by the Town at no cost to the project. The Contractor shall be responsible for coordinating this work.

Town Of Bayfield (Lighting)

The Contractor will be required to furnish and install the electrical conduit, wiring, pull boxes, foundations and lighting required for the Shared Use Path (SUP) as shown in the plans or otherwise directed by the project engineer. A State electrical inspection will be required as part of this work prior to activation. This work will be paid for by contract bit items. The Contractor shall be responsible for completing this work.

Town of Bayfield (Sanitary Sewer)

The Contractor will be required to construct, maintain and operate a temporary bypass sanitary sewer line for the duration of the bridge construction as outlined in the plans and specifications or as otherwise directed by the project engineer. The requirements of this temporary bypass are covered in the Specifications 'Revision of Section 622 - Temporary Sewer Bypass System' as well as the plan sheets and notes relating to the same. Payment for this work will be by planned Force Account – Temporary Sewer Bypass System. The Contractor shall be responsible for completing this work.

Upon completion of the temporary bypass, the Contractor will be required to remove the existing sanitary sewer line attached to the bridges as shown in the plans or otherwise directed by the project engineer. This work will be paid for by contract bid item – Removal of Pipe. The Contractor will be responsible for completing this work.

Once the new structures are sufficiently complete, the Contractor will be required to construct a new gravity sewer line across the bridge structures as shown in the plans or otherwise directed by the project engineer. This work will be paid for by contract bid items. The Contractor shall be responsible for completing this work. As part of the final acceptance for this new gravity sewer line, the Contractor will be required to test the new line in accordance with the Town's specifications and provide "As Built" information to include line and manhole locations, flow line information for each

pipe run and rim elevations per the CDOT Survey Manual. Payment for this work will be considered incidental to the installation of the sewer line and not measured and paid for separately. Any construction deviations to the new gravity sewer line from that shown in the plans and specifications shall be subject to approval by the Project Engineer and the Town prior to performing the work. The Contractor shall be responsible for completing this work.

Black Hills Energy (BHE - Natural Gas)

The Contractor will be required to field verify the depth and location of BHE's facilities in close proximity to any required excavation as determined by the Contractor's locate request. The Contractor shall provide this information to BHE for the purpose of making a determination as to whether additional relocation or adjustment work is required, if any. Payment for this work will be by contract bid item – potholing.

At this time, there are no known relocations or construction conflicts anticipated with BHE for this project.

La Plata Electric Association (LPEA)

The Contractor will be responsible for furnishing and installing the required electrical conduit across the bridge structures for future electrical service needs as shown in the plans or otherwise directed by the Project Engineer. This work will be paid for by contract bit items. The Contractor shall be responsible for completing this work.

The Contractor shall take the necessary precautions while working around existing overhead and buried electric facilities and shall mark these locations as necessary so as to prevent accidental contact during construction operations. Further protective measures may be required at the Contractor's request. This work shall be considered incidental to and included in the cost of the project work. The Contractor shall be responsible for coordinating this work if required.

At this time, there are no known relocations or construction conflicts anticipated with LPEA for this project.

Morrison Consolidated Ditch

The Contractor will be required coordinate with Morrison Consolidated Ditch Company to keep irrigation water flowing during construction. The Contractor will be required to install a temporary irrigation ditch crossing in order to complete the project and shall coordinate this work with Morrison Consolidated Ditch Company. Typical irrigation flows are from May 1st to October 31st each year and range from 100 to 110 CFS but can increase to above 200 CFS during runoff and rain events. Stock flows run from November 1st through March 1st each year and range from 5 to 10 CFS. Stock flows run continuous through this time period. No interruptions to ditch flows outlined above will be allowed unless otherwise approved in writing by Morrison Consolidated Ditch Company. Temporary diversion and/or bypass pumping during irrigation season shall be approved in writing by Morrison Consolidated Ditch Company and approved by the project engineer prior to beginning any work. The Contractor shall plan for these restrictions when bidding this work. Payment for this work will not be measured and paid for separately but shall be considered incidental to and included in the overall cost of the project work.

The work listed below will be performed by the utility owners or their agents:

All Utility Companies
Where applicable, each utility company shall relocate and adjust their facilities and appurtenances to avoid construction conflicts at no cost to the project.

-5-
UTILITIES

CenturyLink

Centurylink will relocate its facilities to avoid construction conflicts as shown in the plans or otherwise directed by the Project Engineer. Insofar as the relocation completion date is currently unknown, this work will occur concurrent with project construction thereby creating restrictions on the Contractor's work progress. It is estimated that this work could take approximately **8 working days** to complete and the contractor shall take the following work restrictions into account when bidding this project as it will impact the Contractor's ability to complete its work. Close coordination will be required as part of this project and the Contractor shall schedule its construction activities accordingly in order to facilitate this work. This work will be performed by Centurylink crews at no cost to the project. The Contractor shall be responsible for coordinating this work.

Town of Bayfield (Fiber Optics)

The Town will adjust its fiber optic lines as shown in the plans or otherwise directed by the project engineer. Insofar as the relocation completion date is currently unknown, this work will occur concurrent with project construction thereby creating restrictions on the Contractor's work progress. It is estimated that this work could take approximately **5 working days** to complete and the Contractor shall take the following work restrictions into account when bidding this project as it will impact the Contractor's ability to complete its work. Close coordination will be required as part of this project and the Contractor shall schedule its construction activities accordingly in order to facilitate this work. This work will be performed by the Town's IT subcontractor and paid for in accordance with subsection 109.04(e) Administrative Compensation under a planned Force Account – Adjust utilities. The Contractor shall be responsible for coordinating and paying for this work.

Town of Bayfield (Water)

No utility relocation or construction conflicts anticipated.

Black Hills Energy (BHE)

No utility relocation or construction conflicts anticipated.

GENERAL:

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

The location of utility facilities as shown on the plan and profile sheets were obtained from the best available information. No warranty is made for the adequacy or accuracy of subsurface information provided. The contractor shall cooperate with the utility owners in their relocation operations as provided in subsection 105.11 of the Standard Specifications for Road and Bridge Construction. No guarantee is made that utility conflicts will be resolved prior to construction activities and any delays resulting from utility relocation work shall be dealt with in accordance with subsection 108.08 of the Standard Specifications for Road and Bridge Construction as amended.

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

REVISION OF REQUIRED CONTRACT PROVISIONS
LCPTRACKER

The Standard Special Provision, Required Contract Provisions Federal-Aid Construction Contracts is hereby revised for this project as follows:

Delete the third paragraph and replace with the following:

The Contractor and all subcontractors who are subject to Davis-Bacon Related Acts (DBRA) requirements, shall submit all payrolls and Contractor Fringe Benefit Statements electronically via LCPtracker, utilizing the following web link:

https://prod.lcptracker.net/WebForms/login.aspx