IDAHO SPRINGS

DEPARTMENT OF PUBLIC WORKS

CENTRAL MINER ST AND SODA CREEK ROAD IMPROVEMENTS
IDAHO SPRINGS, COLORADO

PROJECT SPECIAL PROVISIONS

SEPTEMBER 10, 2018

SPECIAL PROVISIONS

CENTRAL MINER ST. AND SODA CREEK ROAD IMPROVEMENTS
IDAHO SPRINGS, COLORADO

The 2017 CDOT 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

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CENTRAL MINER ST. AND SODA CREEK ROAD IMPROVEMENTS
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STANDARD SPECIAL PROVISIONS

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Revision of Section 101 and 630 – Construction Zone Traffic Control	(April 30, 2015)	2
Revision of Section 103 – Colorado Resident Bid Preference	(February 3, 2011)	1
Revision of Section 103 – Escrow of Proposal Documentation	(May 5, 2011)	2
Revision of Section 105 – Construction Surveying	(July 31, 2014)	1
Revision of Section105 – Disputes and Claims for Contract Adjustments	(August 8, 2016)	33
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Revision of Section 106 – Certificates of Compliance and Certified Test Reports	(February 3, 2011)	1
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Revision of Section 106 – Material Sources	(October 31, 2013)	1
Revision of Section 106 – Supplier List	(January 30, 2014)	1
Revision of Section 107 – Contractor Obtained Stormwater Construction Permit	(July 31, 2014)	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 108 – Delay and Extension of Contract Time	(April 30, 2015)	2
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 – 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 – 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 203 – Imported Material for Embankment	(February 3, 2011)	2
Revision of Sections 203, 206, 304 and 613 – Compaction	(July 19, 2012)	2
Revision of Section 206 – Imported Material for Structure Backfill	(July 19, 2012)	2
Revision of Section 206 – Structure Backfill (Flow-Fill)	(April 26, 2012)	2
Revision of Sections 206 and 601 – Maturity Meters and Concrete Form and False Work Removal	(December 18, 2015)	3
Revision of Section 212 – Seed	(April 26, 2012)	1
Revision of Section 213 – Mulching	(January 31, 2013)	4
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 – Reclaimed Asphalt Pavement	(May 2, 2013)	2
Revision of Section 401 – Temperature Segregation	(February 3, 2011)	1
Revision of Sections 412, 601, and 711 – Liquid Membrane-Forming Compounds for Curing Concrete	(May 5, 2011)	1

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CENTRAL MINER ST. AND SODA CREEK ROAD IMPROVEMENTS
IDAHO SPRINGS, COLORADO

STANDARD SPECIAL PROVISIONS

	Date	No of Pages
Revision of Section 601 – Concrete Batching	(February 3, 2011)	1
Revision of Section 601 – Class B, BZ, D, DT and P Concrete	(February 18, 2016)	1
Revision of Section 601 – QC Testing Requirements for Structural Concrete	(May 18, 2014)	1
Revision of Section 601 – Concrete Finishing	(February 3, 2011)	1
Revision of Section 601 – Concrete Slump Acceptance	(July 29, 2011)	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 Section 603, 624, 705, 707, and 712 – Drainage Pipe	(April 30, 2015)	3
Revision of Section 614, and 713 – Sign Panel Sheeting	(August 11, 2016)	2
Revision of Section 630 – Retroreflective Sign Sheeting	(May 8, 2014)	1
Revision of Section 702 – Bituminous Materials	(October 31, 2015)	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 – Concrete Aggregate	(July 28, 2011)	1
Revision of Section 709 – Epoxy Coated Reinforcing Bars	(February 18, 2016)	1
Revision of Section 712 – Geotextiles	(November 1, 2012)	2
Revision of Section 712 – Water for Mixing or Curing Concrete	(February 3, 2011)	1
Partnering Program	(February 3, 2011)	1

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 City representative. Prospective bidders that wish to have a job showing shall contact the Resident Engineer at least 36 hours in advance of the time they wish to go over the project.

Program Manager -	Tony Galardi, PE HDR Engineering, Inc. 1670 Broadway, Suite 3400 Denver, CO 80202-4824 Office Phone: (303) 829-0859
Resident Engineer -	Bruce Tonilas, PE HDR Engineering, Inc. 1670 Broadway, Suite 3400 Denver, CO 80202-4824 Office Phone: (303) 318-6350
Project Engineer -	Tony Galardi, PE HDR Engineering, Inc. 1670 Broadway, Suite 3400 Denver, CO 80202-4824 Office Phone: 303-829-0859

The above referenced individuals are the only representatives of the City 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 September 25th, 2018 beginning at 2:00 p.m. at Idaho Springs City Hall, 1711 Miner St, Idaho Springs, CO 80452. A site walk through will be conducted after the meeting. Bids will only be accepted from prequalified bidders who attend the Pre-Bid Conference.

Bidders may submit questions until 5:00p.m. on October 1st, 2018. Submit questions by email to the following individuals:

Tony Galardi
HDR Engineering
Tony.Galardi@hdrinc.com

John Bordoni
City of Idaho Springs
PW@idahospringsco.com

Questions received from bidders along with City of Idaho Springs responses will be posted on the web site(s) listed below as they become available but no later than 5:00 p.m. no October 4th, 2018, or you may contact the Program Manager.

- City of Idaho Springs: https://www.colorado.gov/pacific/idahosprings
- Rocky Mountain e-Purchasing System: https://www.bidnetdirct.com/colorado

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 will direct the bidder to contact the Resident Engineer directly to address the question or clarification. The Resident Engineer will keep the bidder's innovation confidential and will not share this information with other bidders.

The Resident Engineer will determine whether questions are innovative or proprietary in nature. If the Resident Engineer determines that a question does not warrant confidentiality, the bidder may withdraw the question. If the bidder withdraws the question, the Resident Engineer will not answer the question and the question will not be documented on the designated web site. If the bidder does not withdraw the question, the question will be answered, and both the question and the City of Idaho Springs answer will be posted on the web site. **-2-**

If the Resident Engineer agrees that a question warrants confidentiality, the Resident Engineer will answer the question, and keep both question and answer confidential. The City of Idaho Springs will keep a record of both question and answer in their confidential file.

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

Complete bids must be received by Tuesday October 9th, 2018 at 2:00p.m. at the Idaho Springs City Hall, 1711 Miner Street, P.O. Box 907, Idaho Springs, Colorado 80452. All bids will be opened and announced publicly at this time. Bids will not be accepted electronically.

The City of Idaho Springs Expects to recommend a bid award at the City Council meeting on Monday, October 22nd, 2018 at 7:00p.m.

All references in the contract documents to CDOT, the Department, Engineer, or such similar term, when used in the context of the Project's owner, shall be interpreted to mean the City of Idaho Springs, Colorado, or their agents and assigns. All other references, when used in the context of referring to official CDOT documents, such as Standard Specifications, Standard Plans, or other such specific document reference, shall be interpreted verbatim.

The Contractor shall submit weekly work reports identifying all quantities installed for that week. Weeks shall run from Sunday through Saturday to include traffic control quantities. The Contractor shall also submit a draft progress estimate monthly, based on the weekly work reports previously submitted. Month-end reports shall coincide with a week-end, not the end of a calendar month. Monthly pay estimates will be based on the Contractor's draft progress estimate. The Engineer will review the Contractor's draft progress estimate against their inspection reports and reconcile any differences with the Contractor prior to processing payment.

Contractor shall be responsible for preparation of the As Constructed plans. In accordance with Subsection 105.02, the Contractor shall maintain Construction Drawings at the project office. Construction Drawings shall be up-to-date at the time of submitting the monthly progress estimate. Progress estimates will not be processed until the Construction Drawings are up-to-date and accepted by the Engineer. Upon completion of the work and prior to final payment, the Contractor shall submit the final draft Construction Drawings to the Engineer for review. The Contractor shall be responsible for making final edits to the Construction Drawings and ensuring the drawings are clearly legible for future reference.

Monthly Progress Payments will not be processed and paid until Construction Drawings and the project CPM schedule have been updated to the same level of percent complete as the Progress Payment request is for.

The Contractor shall be responsible for identifying a field office location acceptable to the Engineer, and adequate staging areas for their operations. The City does not have public rights of way available for these uses.

COMMENCEMENT AND COMPLETION OF WORK
(SPECIFIED COMPLETION DATE)

The Contractor shall select the date that work begins for this project. 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 l4 days before the proposed beginning date. The date that work begins shall be subject to the Engineer's approval.

No removal's or ground breaking activities are allowed on Soda Creek Road prior to January 2, 2019. Complete the asphalt paving of Central Miner St. by May 22nd 2019. Complete all work on Central Miner and Soda Creek no later than September 27th, 2019 in accordance with the contract and as indicated in the "Notice to Proceed."

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

(2) Milling and Concrete Removal

(3) Sanitary Sewer

(4) Water Line and fire hydrant replacement

(5) Storm Drainage

(6) Raw Water Line

(7) Pedestrian Bridges

(8) Curb and Gutter

(9) Sidewalk and Miscellaneous Concrete

(10) Earthwork and Grading

(11) Paving

(12) Striping and Final Signing

(13) Gas & Electric relocation by Xcel Energy

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 electronically by request to HDR, Denver, 1670 Broadway, Suite 3400, Denver, CO 80202-4824 until the date set for opening of bids:

- PLANS and PROJECT SPECIAL PROVISIONS
- SUBSURFACE INVESTIGATION – Subsurface Exploration Program and Geotechnical Evaluation Sod Creek Road Improvements; Idaho Springs, Colorado; May 20, 2016
- CROSS SECTIONS - Cross sections are shown every 50 feet and at other designated locations. Average depths of existing and proposed utilities are shown for information only.

Survey information will be made available at the Resident Engineer's office electronically for the contractors use.

REVISION OF SECTION 105
COOPERATION BETWEEN CONTRACTORS

Section 105 of the Standard Special Provisions is hereby revised for this project as follows:

Subsection 105.12 shall include the following:

Other construction agencies may be working in the vicinity of the project. The Contractor shall conduct the work so as not to interfere with or hinder the progress or completion of the work being performed by other agencies or contractors. All traffic control conflicts that arise between the needs of the various construction contractors and other agencies shall be brought to the attention of the Engineer. The Engineer will decide the method of resolution. All costs associated with the foregoing requirements shall be incidental to the contract.

REVISION OF SECTION 105
HOT MIX ASPHALT PAVEMENT SMOOTHNESS

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

Delete subsection 105.07 and replace with the following:

105.07 Conformity to Roadway Smoothness Criteria of HMA. Roadway smoothness testing and corrective work shall be performed as described below. The pavement smoothness category shall be HRI Category II unless shown on the plans.

(a) *Smoothness Quality Control Testing.*

1. The Contractor shall perform Smoothness Quality Control (SQC) testing. The test results shall be submitted to the Engineer within 48 hours of completion. SQC test results shall show the Half Car Roughness Index (HRI) for each 0.10 mile section and shall show the results for localized roughness.

All traffic control costs associated with SQC testing will be paid for in accordance with Section 630.

SQC testing shall be performed on the first 2,000 tons for the final layer.

SQC testing shall be performed using the Contractor's inertial profiler, pursuant to the methods described in subsection 105.07(b) and in accordance with the manufacturer's recommendations. The Contractor's Profiler shall be certified according to CP 78. A list of certified profilers is located at http://www.dot.state.co.us/DesignSupport/.

Production shall be suspended if SQC testing indicates that corrective work is required in accordance with subsection 105.07 (c). If the SQC data becomes available after production has started for the day, suspension will begin at the end of that production day. Production will remain suspended until the problem is identified and corrected. Each time production is suspended, corrective actions shall be proposed in writing by the Contractor. Production will not be allowed to resume until the proposed corrective actions have been accepted by the Project Engineer in writing.

When production resumes, the Contractor shall profile the first 2,000 tons of HMA. The conditions above for suspension of work will apply.

2. The finished transverse and longitudinal surface elevation of the pavement shall be measured using a 10 foot straightedge. Areas to be measured will be directed by the Engineer. The Contractor shall furnish an approved 10 foot straightedge, depth gauge and operator to aid the Engineer in testing the 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.

(b) Initial Smoothness Acceptance Testing. The Contractor shall perform Smoothness Acceptance Testing (SA) which will be used for acceptance.

All traffic control costs associated with SA testing will be paid for in accordance with Section 630.

1. Longitudinal Pavement Surface Smoothness Acceptance. Pavement surfaces shall be tested and accepted for longitudinal smoothness as described herein.

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REVISION OF SECTION 105
HOT MIX ASPHALT PAVEMENT SMOOTHNESS

A. Testing Procedure (General). The longitudinal surface smoothness of the final pavement surface shall be tested by the Contractor in accordance with CP 74 and using the Contractor's high-speed profiler (HSP). The Contractor's Profiler shall be certified according to CP 78. A list of certified profilers is located at http://www.dot.state.co.us/DesignSupport/

The HSP instrumentation shall be verified in accordance with CP 74 prior to measurements. The Contractor shall lay out a distance calibration site. The distance calibration site shall be located no more than ten miles from the Project limits. The distance calibration site shall be 1056 feet long and shall be on a relatively flat, straight section of pavement as approved by the Engineer. The site shall have a speed limit equal to the Project's highest speed limit that allows for the HSP to operate uninterrupted. The limits of the site shall be clearly marked and the distance shall be measured to an accuracy of +/- 3 inches. The Contractor shall provide in writing the site location to the Engineer. The cost of the distance calibration site will not be measured and paid for separately, but shall be included in the work.

The entire length of each through lane, climbing lane and passing lane including bridge approaches, bridge decks and intersections from the beginning to the end of the project shall be profiled in their planned final configuration. Shoulders less than 12 foot in width and medians, will not be profiled. Shoulders with a width of 12 feet or more, ramps, tapers, turn slots, acceleration lanes and deceleration lanes will be evaluated for localized roughness corrective work. The profile of the entire length of a lane shall be taken at one time. However, the Engineer may break a project into sections to accommodate Project phasing.

A sufficient distance shall be deleted from the profile to allow the profiler to obtain the testing speed plus a 300 foot distance to stop and start when required. The final surface of these areas shall be tested in accordance with subsection 105.07(a) 2.

Shoulders less than 12 foot in width and medians constructed as part of this project shall be measured in accordance with subsection 105.07(a) 2.

The profile shall include transverse joints when pavement is placed by the project on both sides of the joint. When pavement is placed on only one side of the joint, the profile shall start 25 feet outside the project paving limits. The profile of the section of pavement 25 feet outside the paving limits to 25 feet inside paving limits will not be subjected to incentive or disincentive adjustments, but will be evaluated for localized roughness.

The profile of the area 25 feet each side of every railroad crossing, cattle guard, bus pad, manhole, gutter pan and intersection (where there is a planned breakpoint in the profile grade line in the direction of traffic) shall be deleted from the profile before the HRI is determined. Areas deleted from the profile shall be tested in accordance with subsection 105.07(a) 2.

When both new pavement and a new bridge or new bridge pavement are being constructed in a project, the profile of the area 25 feet each side of the bridge deck shall be deleted from the profile before the HRI is determined. Incentive/disincentive adjustments will not be made for this area. Areas deleted from the profile shall be tested in accordance with subsection 105.07(a) 2. The bridge deck will be evaluated for localized roughness. Corrective work required in these areas will not be measured and paid for separately, but shall be included in the work. For all other projects, the profile of the area 25 feet each side of the bridge deck shall be deleted from the profile before the HRI is determined. Areas deleted from the profile shall be tested in accordance with subsection 105.07(a) 2.

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REVISION OF SECTION 105
HOT MIX ASPHALT PAVEMENT SMOOTHNESS

The Contractor shall notify the Engineer in writing at least five working days in advance of his intention to perform SA testing. The Contractor shall profile the Project within 14 days after the completion of paving operations. The Engineer will witness the SA profiling and take immediate possession of the SA data.

The Contractor shall not perform any corrective work that will affect the pavement smoothness for ten working days after completion of the SA testing or as approved by the Engineer. This time is to allow for the Department to analyze the data and perform smoothness verification testing.

B. Smoothness Testing Procedures. The Contractor shall mark the profiling limits and excluded areas. The Engineer will verify that the Contractor's marks are located properly. The Contractor shall use traffic cones with reflective tape or reflective tape on the pavement at the beginning and end of each lane for triggering the start and stop locations on the profiler and at any other location, where portions of the profile are being deleted. These locations shall be marked with temporary paint so that the Department's profiler uses the same locations for smoothness verification testing.

The ambient temperature shall be at least 34 °F for the profiler to operate.

The Contractor shall clear the lanes to be tested of all debris before profiling.

The Contractor shall submit a Method for Handling Traffic (MHT) to the Engineer for approval at least five days in advance of SA testing. The MHT shall detail the methods for traffic control that will allow for continuous non-stop profiling of each lane to be profiled at a minimum speed of 15 mph. The Contractor shall provide the traffic control in accordance with the approved MHT.

Each lane shall be profiled at least once. Profiling shall be at a constant speed (+/- 5 mph of the distance calibration speed) with a minimum speed of 15 mph and a maximum speed of 70 mph. Shoulders with a width of 12 feet or more, ramps, tapers, turn slots, acceleration lanes and deceleration lanes shall be profiled**.** The profile shall be taken in the planned direction of travel. The left and right wheel paths shall be profiled simultaneously. The collected profiles shall be turned over immediately to the Engineer and will be analyzed using CP 74.

(1) The Department will determine a HRI for each 0.1 mile section or fraction thereof of completed pavement. The HRI consists of the left and right wheel path's profile passed through the International Roughness Index (IRI) filter.

The Contractor's SA test results will be available within ten working days of the completion of SA testing. The Engineer will give the Contractor a report that will include the lane profiled, the HRI in 0.10 mile increments and a summary of areas requiring corrective work. The Engineer may determine that it is necessary for the Contractor to re-profile a lane.

Areas requiring corrective work will be determined according to subsection 105.07(c) 1.

Sections less than 0.01 miles in length shall not be subject to corrective work as specified by Table 105-6. Sections less than 0.01 miles in length shall be included in the Localized Roughness determination.

C. Acceptance for pavement smoothness will be made on a in accordance with 105.07(c):

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REVISION OF SECTION 105
HOT MIX ASPHALT PAVEMENT SMOOTHNESS

(c) *Corrective Work.*

The Department will analyze the SA testing for acceptance and indicate areas requiring corrective work in accordance with subsection 105.07(b). Corrective work shall be proposed in writing by the Contractor. Corrective work shall not be performed until approved in writing by the Engineer. The Contractor shall perform corrective work in the areas indicated by the SA testing.

Corrective work on lower layers shall be at the Contractor's discretion.

The Contractor shall profile the roadway to verify the required corrective work has been completed.

The criteria for determining if a 0.1 mile section or fraction thereof requires corrective work is specified in Table 105-6. In addition to determining if a 0.1 mile section or fraction thereof requires corrective work, the profiles shall be analyzed for areas of Localized Roughness.

Localized Roughness. The profiles shall be analyzed to determine where areas of localized roughness occur. The profile shall be summarized using the continuous HRI reporting system using an averaging length of 25 feet. The FHWA's latest version of ProVal software will shall be used to generate the continuous HRI report. ProVal can be downloaded at http://www.roadprofile.com.

Areas of localized roughness are determined to be where the continuous HRI report exceeds the values in Table 105-9. Areas of localized roughness greater than 15.0 feet in length shall be considered deficient, and require corrective work. Areas of localized roughness less than 25 feet in distance that contain a valve box shall be tested in accordance with subsection 105.07 (a) 2. for corrective work.

Table 105-9
CONTINUOUS HRI USING 25 FOOT AVERAGING FOR LOCALIZED ROUGHNESS CORRECTIVE WORK ON HMA PAVEMENTS

HRI SMOOTHNESS CATEGORY	HRI In/mile
III	150.0

1. Corrective Methods. Corrective work shall consist of diamond grinding, an approved overlay, or removal and replacement.

Corrective work shall conform to of one of the following conditions:

(1) Removal and Replacement. The pavement requiring corrective work shall be removed, full width of the lane and the full thickness of the layer in accordance with subsection 202.09.

The removal area shall begin and end with a transverse butt joint, which shall be constructed with a transverse saw cut perpendicular to centerline. Replacement material shall be placed in sufficient quantity so the finished surface conforms to grade and smoothness requirements. Sections removed and replaced shall be at least 0.20 miles in length.

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REVISION OF SECTION 105
HOT MIX ASPHALT PAVEMENT SMOOTHNESS

(2) Overlay. The overlay shall cover the full width of the pavement including shoulders. The area overlaid shall begin and end with a transverse butt joint, which shall be constructed with a transverse saw cut and asphalt removal. All material shall be approved hot bituminous mixtures that meet all contract requirements. The overlay shall be placed so that the finished surface conforms to grade and smoothness requirements. The overlay area shall be compacted to the specified density. The overlay thickness shall be equivalent to that of the final layer in accordance with the Contract. Sections overlaid shall be at least 0.20 miles in length.

(3) Diamond Grinding. Grinding shall not reduce planned pavement thickness by more than 0.3 inches. Diamond grinding shall be the full width of the lane. The entire ground area of the final pavement surface shall be covered with a Tack Coat conforming to Section 407 (CSS-1h at 0.1 gallons per square yard of diluted emulsion; the emulsion shall be diluted with water at the rate of 50 percent water and 50 percent emulsion) when grinding is complete. Cores shall be taken to verify that minimum pavement thicknesses have been maintained. A minimum of one core shall be taken every 100 cumulative feet or fraction thereof per lane of diamond grinding, as directed by the Engineer. Coring shall be at the Contractor's expense.

(d) *Final Smoothness Acceptance Testing.* After the Contractor has completed the required corrective work and any additional corrective work, the Contractor shall retest the pavement in accordance with subsection 105.07(b). If the Contractor requests to do additional corrective work after Final SA Testing, the Contractor shall perform an additional Final SA Testing for the project. A charge of $500 will be assessed to the Contractor for each additional Final SA Testing. Time count will be charged pursuant to contract requirements during the time period required for all Final SA Testing. Delays associated with additional Final SA Testing will be considered non-excusable and non-compensable.

The Contractor shall notify the Engineer pursuant to 105.07(b) to schedule the final SA testing.

Final acceptance will be based on providing a surface with no area exceeding the localized roughness threshold or bumps, according to 105.07(a)(2), or as accepted by the engineer.

(e) *Department Smoothness Verification Testing (SV).* The Department may elect to perform smoothness verification (SV) testing using the Department's inertial profiler, with the methods described in subsection 105.07(b). The Engineer will notify the Contractor of the Department's intention to perform SV testing. All traffic control costs associated with Department SV testing will be paid for by the Department in accordance with Section 630.

The Contractor's SA test results will be compared to the Department's SV test results. The Contractor's SA test results will be considered acceptable and will be used for incentive/disincentive payment if the following criteria are met:

(1) The difference in HRI for a 1/10 mile section is less than 6.1 inches/mile for a minimum of 90 percent of the 1/10mile sections for each lane.
(2) The difference in average HRI for each lane is less than 6.1 inches/mile.
(3) The difference in the length of each lane is less than 0.2 percent

When the Contractor's SA test results are not considered acceptable, the Department's SV test results will be used for incentive/disincentive payment and the Contractor's profiler certification will be evaluated pursuant to CP 78. The Department will have 30 days to complete this evaluation.

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REVISION OF SECTION 105
HOT MIX ASPHALT PAVEMENT SMOOTHNESS

The Contractor will be assessed a charge of $1,000 for SV testing when the Contractor's SA test results are not considered acceptable.

(f) *HRI Category IV: HMA Recycling Treatments Thin Lifts and Urban Rehabilitation treatments smoothness criteria.* For HRI Category IV pavements, the following shall be used for acceptance:

An HRI for each 0.1 mile section shall be determined on the original pavement surface prior to beginning the work.

An HRI for each 0.1 mile section shall be determined on the pavement surface after the work is complete.

When a 0.1 mile section has a final HRI greater than 80.0 in/mile and the final HRI is greater than the HRI prior to performing the work, that 0.1 mile section shall be corrected by a method approved in writing by the Engineer. Corrective work shall be such that the resulting final HRI is equal to or less than the initial HRI or 80.0 in/mile, whichever is greater. All costs associated with corrective work shall be at the Contractor's expense, including but not limited to traffic control, additional hot mix asphalt, grinding and milling.

Incentive/disincentive adjustments for smoothness will not be made for Category IV. Localized Roughness determinations will not be made for HRI Category IV.

The pavement smoothness for HMA Recycling Treatments and Thin Lifts that will be overlaid with a final riding surface will not be evaluated by the Department for acceptance.

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

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

Subsection 107.02 Permits, Licenses and Taxes shall include the following:

All work between approximate station 27+50 and the south limit of the project is on Clear Creek County property. Prior to beginning any work in that area obtain a Road Cut/ROW Permit from Clear Creek County and provide a copy to the Engineer. The fee for the permit should be no more than $400 but will require a 12 Month Performance Guaranty, in the form of a letter of credit, to the County covering the full cost of work within the County property. Include the cost of obtaining the permit and line of credit in the mobilization bid item.

Permit requirements can be found in Sections 5.2 and 5.3 of County Road Design and Construction Manual at:

https://www.co.clear-creek.co.us/DocumentCenter/Home/View/457

Subsection 107.15 shall include the following:

The City's Program Manager, HDR Engineering, Inc., shall be listed as an additional insured on the Contractor's Commercial General Liability Insurance policy.

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:

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

(1) Temporary works: falsework, shoring that exceeds 5 feet in height, and cofferdams.

The Contractor shall submit, for record purposes only, an initial detailed construction plan that addresses safe construction of each of the safety critical elements. When the specifications already require an erection plan or a bridge removal plan, it shall be included as a part of this plan. The detailed construction plan shall be submitted two weeks prior to the safety critical element conference described below. The construction plan shall be stamped "Approved for Construction" and signed by the Contractor. The construction plan will not be approved by the Engineer.

The Construction Plan shall include the following:

(1) Safety Critical Element for which the plan is being prepared and submitted.

(2) Contractor or subcontractor responsible for the plan preparation and the work.

(3) Schedule, procedures, equipment, and sequence of operations, that comply with the working hour limitations

(4) Temporary works required: falsework, bracing, shoring, etc.

(5) Additional actions that will be taken to ensure that the work will be performed safely.

(6) Names and qualifications of workers who will be in responsible charge of the work:

A. Years of experience performing similar work

B. Training taken in performing similar work

C. Certifications earned in performing similar work

(7) Names and qualifications of workers operating cranes or other lifting equipment

A. Years of experience performing similar work

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

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REVISION OF SECTION 107
PERFORMANCE OF SAFETY CRITICAL WORK

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.

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 final construction plan shall be stamped "Approved for Construction" and signed by the Contractor.

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

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

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

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 City.

REVISION OF SECTION 107
WATER QUALITY

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

Subsection 107.25 shall include the following:

The contractor shall follow the applicable general and regional conditions associated with non-notifying Section 404 Permit, which follow:

1. *Suitable Material*. No activity may use unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see Section 307 of the Clean Water Act).
2. *Water Supply Intakes*. No activity may occur in the proximity of a public water supply intake, except where the activity is for the repair or improvement of public water supply intake structures or adjacent bank stabilization.
3. *Adverse Effects from Impoundments*. If the activity creates an impoundment of water, adverse effects to the aquatic system due to accelerating the passage of water, and/or restricting its flow must be minimized to the maximum extent practicable.
4. *Management of Water Flows*. To the maximum extent practicable, the pre-construction course, condition, capacity, and location of open waters must be maintained for each activity, including stream channelization and storm water management activities, except as provided below. The activity must be constructed to withstand expected high flows. The activity must not restrict or impede the passage of normal or high flows, unless the primary purpose of the activity is to impound water or manage high flows. The activity may alter the pre-construction course, condition, capacity, and location of open waters if it benefits the aquatic environment (e.g., stream restoration or relocation activities).
5. *Fills Within 100-Year Floodplains*. The activity must comply with applicable FEMA-approved state or local floodplain management requirements.
6. *Equipment*. Heavy equipment working in wetlands or mudflats must be placed on mats, or other measures must be taken to minimize soil disturbance.
7. *Soil Erosion and Sediment Controls*. Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow.
8. *Removal of Temporary Fills*. Temporary fills must be removed in their entirety and the affected areas returned to pre- construction elevations. The affected areas must be revegetated, as appropriate.
9. *Proper Maintenance*. Any authorized structure or fill shall be properly maintained, including maintenance to ensure public safety and compliance with applicable NWP general conditions, as well as any activity-specific conditions added by the district engineer to an NWP authorization.
10. *Discovery of Previously Unknown Remains and Artifacts*. If you discover any previously unknown historic, cultural or archeological remains and artifacts while accomplishing the activity authorized by this permit, you must immediately notify the district engineer of what you have found, and to the maximum extent practicable, avoid construction activities that may affect the remains and artifacts until the required coordination has been completed. The district engineer will initiate the Federal, Tribal and state coordination required to determine if the items or remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

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REVISION OF SECTION 107
WATER QUALITY

11. Contractor shall take care to not operate any equipment in the stream. All equipment shall be operated from the bank or top of bank. Work shall be performed at low water levels in the spring of the year before water levels rise. Should water level be high enough so as to require a temporary dike around the work zone, the dike shall be constructed from the top of bank, not with equipment located in the stream.

REVISION OF SECTION 108
PROJECT SCHEDULE

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

Subsection 108.03 shall include the following:

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

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

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

Subsection 108.03 (c) shall include the following:

Changes in logic and/or durations shall not be made without first providing written notification to Engineer for Contractor's need to change. No work/activity shall commence without written approval from the Engineer accepting said changes.

The Contractor shall submit a written justification for requested schedule changes. The Engineer will review and determine whether the requested change is reasonable. Acceptance or rejection of such changes is without liability. Logic or duration changes to simply accommodate a perception of still being on-schedule will not be accepted.

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

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

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

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

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

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REVISION OF SECTION 108
PROJECT SCHEDULE

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

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

(6) Summary of Activities

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

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

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

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

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

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

i. All logical relationships shall be Finish-to-Start (FS), with the following exceptions:

- at the start or origin, activities may be start to start (SS)
- at a milestone or at the conclusion of the network, activities may be Finish-to-Finish (FF)
- use in Summary activities

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

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

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

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

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REVISION OF SECTION 108
PROJECT SCHEDULE

Use of the following float-suppression techniques, such as preferential sequencing (arranging critical path through activities more susceptible to City-caused delay) shall be cause for rejection of the Project Schedule or its Updates:

a. Special lead/lag logic restraints,

b. Zero total or free float constraints,

c. Imposing constraint dates other than as required by the contract.

d. The use of Resource Leveling or similar software features used for the purpose of artificially adjusting activity durations to consume float and influence the critical path is expressly prohibited.

Definitions of Float (or Slack):

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

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

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

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

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

In Subsection 108.03 (c) delete subsection (1)

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

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

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

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

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

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REVISION OF SECTION 108
PROJECT SCHEDULE

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

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

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

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

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

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

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

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

REVISION OF SECTIONS 201
CLEARING AND GRUBBING

Section 201 of the Standard Specifications is hereby revised for this project as follows:

DESCRIPTION

Subsection 201.01 shall include the following:

Clearing and grubbing shall include the removal and disposal of steps, planters, miner structures, posts, bollards, vegetation, soils and any other miscellaneous objects not specifically paid for under a removal pay item.

REVISION OF SECTIONS 202, 203 & 210
REMOVALS AND RESETS

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

DESCRIPTION

Subsection 202.01 shall include the following:

CONSTRUCTION REQUIREMENTS

Subsection 202.02 shall include the following:

Fire hydrants and manhole lids and frames shall be salvaged and delivered to the City of Idaho Springs Public Works.

Where sewers are to be left in place and plugged, remove the existing manholes and plug the sewers at both ends to prevent future settlement. Where existing water mains are to be left in place and abandoned, remove hydrants, valve boxes, and valves, and plug exposed ends of the pipe.

For any work that requires flow fill (flash fill), the Contractor must submit to the Engineer for approval a mix for flow fill (flash fill) conforming to the requirements of section 206.02(a) and a plan/method for installing the flow fill (flash fill) which will adequately fill all voids. When a separate pay item for plugging is not provided, plugging and flow fill will not be paid for separately but shall be included in the cost for the work requiring the plugging (pipe removal, etc.)

Subsection 202.09 shall include the following:

Asphalt millings may be stockpiled and used as asphalt patching during trenching operations.

METHOD OF MEASUREMENT

Subsection 202.11 shall include the following:

REVISION OF SECTIONS 202, 203 & 210
REMOVALS AND RESETS

Removal of Asphalt Mat includes the removal of any asphalt in the project limits regardless of depth. The contractor may elect to plane (mill) the existing asphalt for use as detour pavement. Processing of the removal of asphalt mat for use in detour pavement will not be measured or paid for separately but shall be included in the cost of the work.

Removal of Structure (Special) shall consist of removing the existing sidewalks attached to the Soda Creek Box Culvert. Completely remove the concrete surface, pedestrian railing, and steel supports without damage to the existing box culvert. Remove the steel supports, flush with the face of the box culvert, by sawing or torching in a manner that doesn't damage the box culvert. Coordinate with Xcel Energy prior to removing the south sidewalk as there is an existing gas line attached to the underside of the sidewalk.

Reset of Water Meter will include removing and relocating the existing water meter and electric service. Excavation, backfill, labor, and equipment required for this relocation will not be measured separately but will be included in the cost of the Reset of Water Meter.

Sawing asphalt material shall be measured by the linear foot regardless of depth, completed, and accepted. This includes sawing around locally important retaining walls, existing structures, adjacent parking lots and fences or as directed by the Engineer. Sawing of asphalt pavement shall be included in Sawing asphalt material.

Sawing Concrete Material shall be measured by linear foot regardless of depth, completed, and accepted. This includes sawing around existing driveway tie-ins and along the construction limits. Sawing of concrete pavement shall be included in Sawing Concrete Material.

Plugging of existing water line, to be abandoned, will not be measured for payment but will be included in the price for Removal of Valve and Removal of Fire Hydrant.

Removal of Fire Hydrant shall include the removal, resetting, and/or relocation of fire hydrant barrel, water service laterals, valves, and all related appurtenances. Fire hydrants and manhole lids shall be salvaged and delivered to the City of Idaho Springs Public Works.

Removal of manhole shall include the removal of the sanitary sewer manhole cone, plugging the connected pipes to be abandoned with lean concrete, and backfilling of the manhole including the backfill with embankment material, aggregate base course material or flow fill as approved by the engineer: The plugging of pipes and backfill of this manhole with the approved material as noted will not be measured and paid for separately but shall be included in the cost of removal of manhole.

BASIS OF PAYMENT

Subsection 202.12 shall include the following:

Payment will be made under:

Pay Item	Pay Unit
Removal of Structure (Special)	Each
Reset Water Meter	Each
Removal of Wall	LF
Removal of Tree	Each
Removal of Manhole	Each
Removal of Inlet	Each
Removal of Fire Hydrant	Each
Removal of Valve	Each
Removal of Sidewalk	SY
Removal of Curb	LF
Removal of Curb and Gutter	LF
Removal of Wheel Stop (Salvage)	Each
Removal of Asphalt Mat	SY
Removal of Asphalt (2" Milling)	SY
Removal of Ground Sign	Each
Removal of Fence	LF

Sawing Concrete	LF
Sawing Asphalt Material	LF

REVISION OF SECTION 203
VOIDS REPAIR

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

Subsection 203.03 shall include the following:

Voids may be encountered under the road surface or sidewalk surface adjacent to the roadway due to previous mining activity in the area. The Contractor is cautioned that all excavation shall proceed with caution to ensure the safety of both life and property. All voids encountered shall be repaired by backfilling with either Structure Backfill (flowfill) or Structure Backfill (Class 1) or as approved and directed by the Engineer. The Contractor shall propose a method of protecting and filling voids to the Engineer for approval

Repair of voids shall be paid for as Force Account – Voids Repair.

REVISION OF SECTION 203
LABORER AND POTHOLING

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

Subsection 203.01 shall include the following:

This work consists of providing a laborer to perform work requested by the Engineer.

This work consists of providing utility locating and potholing in accordance with the Utilities section and as directed by the Engineer.

Subsection 203.04 shall include the following:

The Contractor shall provide one or more workers in the classification of Laborer to perform work requested by the Engineer. The Contractor shall be responsible for providing direction, oversight, and support as necessary to complete the work identified by the Engineer.

The contractor shall provide all equipment, materials, labor and oversight required to complete utility locating and potholing.

Subsection 203.12 shall include the following:
Laborer will be paid by the time, in hours, incurred by Laborer required to perform the work requested by the Engineer, as approved.

Potholing will be paid by the time, in hours, required to perform the work described in the Utilities section and as directed and approved by the engineer.

Subsection 203.13 shall include the following:

The accepted quantities will be paid for at the contract price for each of the pay items listed below.

Payment will be made under.

Pay Item	**Unit**
Laborer	Hour
Potholing	Hour

REVISION OF SECTION 206
EXCAVATION AND BACKFILL FOR STRUCTURES

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

In Subsection 206.02(a), replace the last sentence in the second paragraph with the following:

The Contractor may substitute structure backfill (flow-fill) for structure backfill (class I) or structure backfill (class 2) to backfill culverts.

Subsection 206.03 shall include the following:

All pipes and conduit (water, raw water, sanitary sewer, storm sewer, future fiber) placed in Soda Creek road shall *be backfilled with structural backfill (flow-fill) according to the City of Idaho Springs standard detail in the plans. Include the cost of Flow-Fill in the unit price for the appropriate pipe pay items.*

Subsection 206.02 shall include the following:

(e) *Bracing, Bedding and Backfill for Sewer Pipe, Water Pipe and Structures*. All trenches shall be backfilled after pipe, fittings, and appurtenances have been installed. Bedding and backfill shall be moistened, tamped and rolled or otherwise compacted in not more than 8" lifts to 95% maximum density. Squeegee material may be allowed with the approval of the Engineer.

Any additional requirements involving rock excavation, bracing, etc., shall be made in accordance with the City of Idaho Springs and the Engineer.

The bedding material shall be clean well graded squeegee sand and shall conform to the following limits when tested by means of laboratory sieves:

SIEVE SIZE	TOTAL PERCENT PASSING BY WEIGHT
3/8 INCH	100
NO. 200	0-5

Subsection 206.06(b) Delete this subsection and substitute the following:

For all pipes, structure excavation, structure backfill, embankment, and pipe bedding will not be measured separately, but shall be included in the bid price of the pipe.

Subsection 206.07 shall include the following:

Structure excavation, structure backfill (including flow-fill), filter material and bedding material required for all pipe and pipe extensions, valves and valve boxes, and manholes will not be measured and paid for separately but shall be included in the work. Dewatering may need to be a continuous operation in order to maintain excavation and pipe placement in dry conditions. Do not allow ground water to enter the new or old water or sewer lines at any time. Compaction, water, pumping, bailing, draining, filtering, sheeting, bracing, and all other work necessary to complete the above items will not be measured and paid for separately, but shall be included in the work.

Subsection 206.09 shall include the following:

Shoring methods shall not impact residential utility services.

Shoring for utility installation and utility trenching activities will not be paid for separately, but shall be included in the work.

Temporary shoring or excavation required to maintain any trenches will not be paid for separately, but shall be included in the work.

REVISION OF SECTION 208
EROSION CONTROL

Section 208 is hereby deleted from the Standard Specifications for this project and replaced with the following:

DESCRIPTION

208.01 This work consists of constructing, installing, maintaining, and removing when required, Best Management Practices (BMPs) during the life of the Contract to prevent or minimize erosion, sedimentation, and pollution of any State waters as defined in subsection 107.25, including wetlands.

The Contractor shall coordinate the construction of temporary BMPs with the construction of permanent BMPs to assure economical, effective, and continuous erosion and sediment control throughout the construction period.

When a provision of Section 208 or an order by the Engineer requires that an action be immediate or taken immediately, it shall be understood that the Contractor shall at once begin effecting completion of the action and pursue it to completion in a manner acceptable to the Engineer, and in accordance with the Colorado Discharge Permit System Stormwater Construction Permit (CDPS-SCP) requirements.

MATERIALS

208.02 Erosion control materials are subject to acceptance in accordance with subsection 106.01. Erosion control materials shall be subject to the following approval process:

Material	**Approval Process**	**Notes:**
Erosion Bales (Weed Free)	**COC**	**The Contractor shall provide a transit certificate number or a copy of the transit certificate as supplied from the producer.**
Silt Fence	**COC**	
Silt Berm	**APL**	
Erosion Log (Type 1 and 2)	**COC**	
Silt Dikes	**COC**	
Pre-fabricated Concrete Washout Structures (above ground)	**APL**	
Pre-fabricated Vehicle Tracking Pad	**APL**	
Aggregate Bag	**COC**	
Storm Drain Inlet Protection (Type I, II and III)	**APL**	

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REVISION OF SECTION 208
EROSION CONTROL

The material for BMPs shall conform to the following:

(a) *Erosion Bales.* Material for erosion bales shall consist of Certified Weed Free hay or straw. The hay or straw shall be certified under the Colorado Department of Agriculture Weed Free Forage Certification Program and inspected as regulated by the Weed Free Forage Act, Title 35, Article 27.5, CRS. Each certified weed free erosion bale shall be identified by blue and orange twine binding the bales.
The Contractor shall not place certified weed free erosion bales or remove their identifying twine until the Engineer has inspected and accepted them.

The Contractor may obtain a current list of Colorado Weed Free Forage Crop Producers who have completed certification by contacting the Colorado Department of Agriculture, Weed Free Forage Program, 305 Interlocken Pkwy, Broomfield, CO 80021, Contact: Weed Free Forage Coordinator at (303) 869-9038. Also available at www.colorado.gov/ag/csd.

Bales shall be approximately 5 cubic feet of material and weigh at least 35 pounds. Stakes shall be wood and shall be 2 inch by 2 inch nominal.

(b) *Silt Fence*. Silt fence posts shall be wood with a minimum length of 42 inches. Wood posts shall be 1.5 inch by 1.5 inch nominal. Geotextile shall be attached to wood posts with three or more staples per post.
Silt fence geotextile shall conform to the following requirements:

Physical Requirements for Silt Fence Geotextiles

Property	Wire Fence Supported Requirements	Self-Supported Requirements Geotextile Elongation <50%	Test Method
Grab Strength, lbs	90 minimum	124 minimum	ASTM D 4632
Permittivity sec-1	0.05	0.05	ASTM D 4491
Ultraviolet Stability	Minimum 70% Strength Retained	Minimum 70% Strength Retained	ASTM D 4355

Silt Fence (Reinforced). Silt fence posts shall be metal T-post with a minimum length of 66 inches. Metal posts shall be "studded tee" with .095 inch minimum wall thickness. Wire fabric reinforcement for the silt fence geotextile shall be a minimum of 10 gauge, with a maximum mesh spacing of 6 inches. Geotextile shall be attached to welded wire fabric with ties or nylon cable ties 12 inch O.C. at top, mid and bottom wire. Welded wire fabric shall be attached to the post with a minimum three 12 gauge wire ties per post. Vinyl or rubber safety caps shall be installed on all T-post.

(c) *Temporary Berms*. Temporary berms shall be constructed of compacted soil.

(d) *Temporary Slope Drains*. Temporary slope drains shall consist of fiber mats, plastic sheets, stone, concrete or asphalt gutters, half round pipe, metal or plastic pipe, wood flume, flexible rubber or other materials suitable to carry accumulated water down the slopes. Outlet protection riprap shall conform to section 506. Erosion control geotextile shall be a minimum Class 2, conforming to subsection 712.08.

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(e) *Silt Berm.* Silt berm shall consist of an ultraviolet (UV) stabilized high-density polyethylene, shall be triangular in shape, and shall have the following dimensions:

Width	**6 - 11 inches**
Height	**6 - 10 inches**
Weight	**0.3 - 1.4 lbs./sq. ft.**
Percent Open Area	**30 – 50%**

Securing spikes shall be10 to12 inch x 0.375 inch diameter (minimum).

(f) *Rock Check Dam*. Rock Check dams shall be constructed of stone. Stone shall meet the requirements of Section 506.

(g) *Sediment* Trap. In constructing an excavated Sediment Trap, excavated soil may be used to construct the dam embankment, provided the soil meets the requirements of subsection 203.03. Outlet protection riprap shall be the size specified in the Contract and shall conform to Section 506. Erosion control geotextile shall be a minimum Class 1, conforming to subsection 712.08.

(h) *Erosion log*. Shall be one of the following types unless otherwise shown on the plans:

(1) Erosion Log (Type 1) shall be curled aspen wood excelsior with a consistent width of fibers evenly distributed throughout the log. The casing shall be seamless, photo-degradable tube netting and shall have minimum dimensions as shown in Table 208-1, based on the diameter of the log called for on the plans. The curled aspen wood excelsior shall be fungus free, resin free, and free of growth or germination inhibiting substances.

(2) Erosion Log (Type 2) shall consist of a blend of 30-40 percent weed free compost and 60-70 percent wood chips. The compost/wood blend material shall pass a 50 mm (2 inch) sieve with a minimum of 70 percent retained on the 9.5 mm (3/8 inch) sieve and comply to subsection 212.02 for the remaining compost physical properties. The compost/wood chip blend may be pneumatically shot into a geotextile cylindrical bag or be pre-manufactured. The geotextile bag shall consist of material with openings of 1/8 to 3/8 inches of HDPE or polypropylene mesh (knitted, not extruded), and contain the compost/wood chip material while not limiting water infiltration.

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Erosion log (Type 1 and Type 2) shall have minimum dimensions as shown in Table 208-1, based on the diameter of the log.

Table 208-1
NOMINAL DIMENSIONS OF EROSION LOGS

Diameter Type 1 (Inches)	Diameter Type 2 (Inches)	Length (feet)		Weight (minimum) (pounds/foot)	Stake Dimensions (Inches)
		Min.	Max.		
9	8	10	180	1.6	1.5 by 1.5 (nominal) by 18
12	12	10	180	2.5	1.5 by 1.5(nominal) by 24
20	18	10	100	4.0	2 by 2 (nominal) by 30

Stakes to secure erosion logs shall consist of pinewood or hardwood.

(i) *Silt Dikes*. Silt dikes shall be pre-manufactured triangular shaped urethane foam covered with a woven geotextile fabric. The fabric aprons shall extend a minimum of two feet beyond each side of the triangle. Each silt dike shall have the following dimensions:

Dimension	Length
Center height	8 to 10 inches
Base	16 to 21 inches
Section length	3 to 7 feet
Section width including fabric extensions	5.6 feet

Staples shall be 6 gauge and at least 8 inches long.

(j) *Concrete Washout Structure*. The Contractor shall construct a washout structure that will contain washout from concrete placement and construction equipment cleaning operations. Embankment required for the concrete washout structure may be excavated material, provided that this material meets the requirements of Section 203 for embankment.
A pre-fabricated concrete washout structure shall only be used when specified in the Contract. It shall consist of a watertight container designed to contain liquid and solid waste from concrete washout.

(k) *Vehicle Tracking Pad*. Aggregate for the vehicle tracking pad shall be crushed natural aggregate with at least two fractured faces that meets the following gradation requirements:

Sieve size	Percent by weight Passing Square Mesh Sieves
75 mm (3 inch)	100
50 mm (2 inch)	0-25
19.0 mm (¾ inch)	0-15

Recycled crushed concrete or asphalt shall not be used for vehicle tracking pads.

Erosion Control Geotextile shall be Class 2 and conform to the requirements of subsection 712.08.

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Pre-fabricated vehicle tracking pads if specified in the Contract shall have the following properties.

Minimum overall dimensions of the modular systems shall be as follows:

Width of pad along edge of roadway	14 feet
Length of pad	30 feet

Weight (min.) (lbs. /sq. ft.)	8
Crush strength (min.) (psi)	400

(l) *Aggregate Bag*. Aggregate bags shall consist of crushed stone or recycled rubber filled fabric with the following properties:

Diameter (inches)	Weight (minimum) (pounds per foot)
6-8	6
10	10
12	15

Rubber used in bags shall be clean, 95 percent free of metal and particulates.

Crushed stone contained in the aggregate bags shall conform to subsection 703.09, Table 703-7 for Class C.

The aggregate bag shall consist of a woven geotextile fabric with the following properties:

Property	Requirement	Test Method
Grab Tensile Strength	90 lbs. min.	ASTM D 4632
Trapezoid Tear Strength	25 lbs. min.	ASTM D 4533
Mullen Burst	300 psi	ASTM D 3786
Ultraviolet Resistance	70%	ASTM D 4355

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(m) Storm Drain Inlet Protection. Storm drain inlet protection shall consist of aggregate filled fabric with the following dimensions:

Storm Drain Inlet Protection Properties	**Protection Types**		
	[1]Type I	**Type II**	**[3]Type III**
Diameter	4 in.	4 in.	N/A
Minimum Section Length	7 ft.	5 ft.	5 ft.
Apron Insert	---	30 in. or sized to grate	30 in or sized to grate
[1]Type I protection shall be used with Inlet Type R. [2]Type II protection shall be used with Combination Inlet. Option A or B [3]Type III protection Inlet Vane Grate only. Option A or B			

The storm drain inlet protection (Type I, II and III) shall consist of a woven geotextile fabric with the following properties:

Property	**Test Method**	**Unit**	**Requirement**
Grab tensile strength	ASTM D 4632	lbs.	minimum 350X280
Mullen Burst Strength	ASTM D 3786	lbs.	600
Trapezoid Tear Strength	ASTM D 4533	lbs.	minimum 110X95
Percent Open Area	COE-22125-86	%	28
Water Flow Rate	ASTM D 4491	gal./min./ sq. ft.	250
Ultraviolet Resistance	ASTM D 4355	%	70

Curb roll for storm drain inlet protection (Type I and II) shall have an approximate weight of 7 to 10 pounds per linear foot of device. The device shall be capable of conforming to the shape of the curb. Aggregate contained in the storm drain inlet device shall consist of gravel or crushed stone conforming to Table 703-7 for Class C.

Storm drain inlet protection (Type III) shall have insert containment (option A) or insert without storage capacity (option B).

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CONSTRUCTION REQUIREMENTS

208.03 Project Review, Schedule, and Transportation Erosion Control Supervisor. Prior to construction, an on-site Environmental Pre-construction Conference shall be held. The conference shall be attended by:

(1) The Engineer,
(2) The Superintendent,
(3) The Contractor's SWMP Administrator
(4) Supervisors or Foremen of subcontractors working on the project,
(5) The Region Water Pollution Control Manager (RWPCM), and
(6) CDOT personnel (e.g., CDOT Landscape Architect) who prepared or reviewed the Stormwater Management Plan (SWMP).

At this conference, the attendees shall discuss the SWMP, CDPS-SCP, sensitive habitats on site, wetlands, other vegetation to be protected, and the enforcement mechanisms for not meeting the requirements of this specification.

Prior to beginning construction the Contractor shall evaluate the project site for storm water draining into or through the site. When such drainage is identified, BMPs (i.e., Control Measures) shall be used if possible to divert stormwater from running on-site and becoming contaminated with sediment or other pollutants. The diversion may be accomplished with a temporary pipe or other conveyance to prevent water contamination or contact with pollutants. Run-on water that cannot be diverted shall be treated as construction runoff and adequate BMPs shall be employed.

The SWMP Administrator shall evaluate all non-stormwater coming onto the site, such as springs, seeps, and landscape irrigation return flow. If such flow is identified, BMPs shall be used to protect off-site water from becoming contaminated with sediment or other pollutants.

The SWMP Administrator shall review existing inlets and culverts to determine if inlet protection is needed due to water flow patterns. Prior to beginning construction, inlets and culverts needing protection shall be protected and the location of the implemented BMP added to the SWMP site map.

Prior to construction, the Contractor shall implement appropriate BMPs for protection of wetlands, sensitive habitat and existing vegetation from ground disturbance and other pollutant sources, in accordance with the approved project schedule as described in subsection 208.03(b).

When additional BMPs are required and approved by the Engineer, the Contractor shall implement the additional BMPs and the SWMP Administrator shall record and describe them on the SWMP site map. The approved BMPs will be measured and paid for in accordance with subsections 208.11 and 208.12.

(a) *Project Review.* The Contractor may submit modifications to the Contract's BMPs in a written proposal to the Engineer. The written proposal shall include the following information:

(1) Reasons for changing the BMPs.
(2) Diagrams showing details and locations of all proposed changes.
(3) List of appropriate pay items indicating new and revised quantities.
(4) Schedules for accomplishing all erosion and sediment control work.
(5) Effects on permits or certifications caused by the proposed changes.

The Engineer will approve or reject the written proposal in writing within 5 working days after the submittal. The Engineer may require additional control measures prior to approving the proposed modifications.

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Additional modifications and additional BMPs will be paid for at the Contract Unit Price for the specific items involved. If no items exist, they will be paid for as extra work in accordance with subsection 109.04.

(b) *Erosion and Sediment Control Activities*. The erosion and sediment control activities shall be included in the weekly meeting update. The project schedule shall specifically indicate the sequence of clearing and grubbing, earthwork operations, and construction of temporary and permanent erosion control features and stabilization. Project schedule shall include erosion and sediment control work for haul roads, borrow pits, storage and asphalt or concrete batch sites, and all areas within the project limits. If during construction the Contractor proposes changes which would affect the Contract's BMPs, the Contractor shall propose revised BMPs to the Engineer for approval in writing. If necessary, the SWMP Administrator shall update proposed sequencing of major activities in the SWMP. Revisions shall not be implemented until the proposed measures have been approved in writing by the Engineer.

(c) *Erosion Control Management (ECM).* Erosion Control Management for this project shall consist of Erosion Control Inspection and the Administration of the Stormwater Management Plan (SWMP). All ECM staff shall have working knowledge and experience in construction, and shall have successfully completed the Transportation Erosion Control Supervisory Certificate Training (TECS) as provided by the Department. The Superintendent will not be permitted to serve in an ECM role. The Erosion Control Inspector and the Stormwater Administrator may be the same person in projects involving less than 40 acres of disturbed area.

1. Stormwater Management Plan (SWMP) Administration. The SWMP Plan shall be maintained by a SWMP Administrator. The SWMP Administrator shall have completed the TECS certification training as provided by the Department. In the case of a project requiring only one TECS, the SWMP Administrator may also be the Erosion Control Inspector for the project. The name of the SWMP Administrator shall be recorded on SWMP Plan Section 3. B. The SWMP Administrator shall have full responsibility to maintain and update the SWMP Plan and identify to the Superintendent critical action items needed to conform to the CDPS-SCP as follows:

(1) Complete the SWMP Notebook as described in subsection 208.03 (d).

(2) Participate in the Environmental Pre-construction Conference

(3) Attend weekly meetings

(4) Delete

(5) Coordinate with the Superintendent to implement necessary actions to reduce anticipated or presently existing water quality or erosion problems resulting from construction activities.

(6) Coordinate with the Superintendent to ensure that all labor, material, and equipment needed to install, maintain, and remove BMPs are available as needed.

(7) During construction, update and record the following items on the SWMP site map as changes occur:

(i) Limits of Construction (LOC).

(ii) Areas of disturbance (AD) are limits of disturbance (LDA).

(iii) Limits of cut and fill.

(iv) Areas used for storage of construction materials, equipment, soils, or wastes.

(v) Location of any dedicated asphalt or concrete batch plants.

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(vi) Location of construction offices and staging areas.

(vii) Location of work access routes during construction.

(viii) Location of borrow and waste.

(ix) Location of temporary, interim and permanent stabilization.

(x) Location of outfall(s)

(xi) Arrows showing direction of surface flow

(xii) Structural and non-structural BMPs

(xiii) LDA and LOC lines as defined in subsection 107.25

(8) Amend the SWMP whenever there are: additions, deletions, or changes to BMPs. SWMP revisions shall be recorded immediately. Items shall be dated and initialed by the SWMP Administrator. Specifically, amendments shall include the following:

(i) A change in design, construction, operation, or maintenance of the site which would require the implementation of new or revised BMPs; or

(ii) Changes when the SWMP proves to be ineffective in achieving the general objectives of controlling pollutants in stormwater discharges associated with construction activity.

(iii) Changes when BMPs are no longer necessary and are removed.

(9) Complete vegetative survey transects when required in accordance with CDOT Erosion Control and Stormwater Quality Guide.

(10) Start a new site map before the current one becomes illegible. All site maps shall remain in the SWMP notebook.

(11) Document all inspection and maintenance activities. The SWMP and documentation shall be kept on the project site.

(12) When adding or revising BMPs on the SWMP, add a narrative explaining what, when, where, why, and how the BMP is being used, and add a detail to the SWMP notebook.

(i) How to install and inspect the BMP

(ii) Where to install the BMP

(iii) When to maintain the BMP

(13) If using existing topography, vegetation, etc. as a BMP, label it as such on the SWMP site map; add a narrative as to when, where, why, and how the BMP is being used.

(14) Indicate BMPS in use or not in use by recording on Standard Plans M-208-1, M-216-1, and M-615-1 in the SWMP notebook

(15) Record on the SWMP, the approved Method Statement for Containing Pollutant Byproducts.

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(16) Update the potential pollutants list in the SWMP notebook and Spill Response Plan throughout construction.

2. Erosion Control Inspection.
Erosion control inspection shall be performed by TECS certified staff assigned as Erosion Control Inspector (ECI) to the project. One ECI is required for every 40 acres of total disturbed area which is currently receiving temporary and interim stabilization measures as defined in subsection 208.04 (e). An ECI shall not be responsible for more than 40 acres in the project. Accepted permanent stabilization methods as defined in subsection 208.04 (e) will not be included in the 40 acres.

ECI duties shall be as follows:

(1) Coordinate with the SWMP Administrator on reporting the results of inspections

(2) Review the construction site for compliance with the Stormwater Construction Permit.

(3) Inspect with the Superintendent and the Engineer (or their designated representatives) the stormwater management system at least every seven calendar days. Post storm event inspections shall be conducted within 24 hours after the end of any precipitation or snow melt event that may cause surface erosion. If no construction activities will occur following a storm event, post-storm event inspections shall be conducted prior to commencing construction activities, but no later than 72 hours following the storm event. The occurrence of delay in inspections shall be documented in the inspection report. Form 1176 shall be used for all 7 day inspections and inspections following storm events. The Contractor shall notify the Erosion control inspector when a storm event occurs. Failure to perform inspections on time will result in liquidated damages in accordance with subsection 208.09.

Inspections are not required at sites when construction activities are temporarily halted, when snow cover exists over the entire site and melting conditions do not pose a risk of surface erosion. This exception shall be applicable only during the period where melting conditions do not exist, and applies to the routine 7 day, Headquarters and Region inspections, as well as the post-storm event inspections. The following information shall be documented on Form 1176 for use of this exclusion: dates when snow cover occurred, date when construction activities ceased, and date melting conditions began.

The order of precedence for required inspections shall be as follows:

(i) Headquarter water quality inspections

(ii) Delete

(iii) Post-storm event inspections

(iv) 7 day inspections

When one of the listed inspections is performed, the inspections listed below it need not be performed on that day.

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(4) Follow all other agency Stormwater requirements and inspections unless a waiver or other agreement has been made.

(5) The ECI shall immediately report to the Contractor's Superintendent and the SWMP Administrator the following instances of noncompliance:

(i) Noncompliance which may endanger health or the environment.

(ii) Spills or discharge of hazardous substance or oil which may cause pollution of waters of the State.

(iii) Discharge of stormwater which may cause an exceedance of a water quality standard.

(iv) Upset conditions that occur on site.

(6) Spills, leaks, or overflows that result in the discharge of pollutants shall be documented on the Form 1176 by the ECI. The ECI shall record the time and date, weather conditions, reasons for spill, and how it was remediated.

(d) *Documentation Available on the Project.* The following Contract documents and references will be made available for reference at the CDOT field office during construction:

1. SWMP Notebook. The Contractor will be responsible to provide a SWMP Notebook at the Preconstruction Conference, which is and shall become the property of the City of Idaho Springs. The Engineer will provide to the contractor items 1-5 and the Contractor shall provide the contents required for items (5) through (18). The notebook shall be stored in the City of Idaho Springs field office or at another on-site location approved by the Engineer. The SWMP Administrator shall modify and update the notebook as needed to reflect actual site conditions, prior to or as soon as practicable but in no case more than 72 hours after the change. The following Contract documents and reports shall be kept, maintained, and updated in the notebook under the appropriate items by the SWMP Administrator:

(1) SWMP Plan Sheets - Notes, tabulation, sequence of major activities, area of disturbance, existing soil data, existing vegetation percent cover, potential pollutant sources, receiving water, non-stormwater discharges and environmental impacts.

(2) Site Map and Plan Title Sheet - Construction site boundaries, ground surface disturbance, limits of cut and fill, flow arrows, structural BMPs, non-structural BMPs, Springs, Streams, Wetlands and surface water. Also included on the sheets is the protection of trees, shrubs and cultural resources.

(3) Specifications - Standard and Project special provisions related to Stormwater and Erosion Control.

(4) Standard Plans M-208-1, M-216-1 and M-615-1

(5) BMP Details not in Standard Plan M-208-1 - Non-standard details.

(6) Weekly meeting sign in sheet.

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(7) Calendar of Inspections -Calendar of inspections marking when all inspections take place.

(8) Form 1176 – Weekly meeting notes and inspection report

(9) Water Quality Reports and Form 105(s) relating to Water Quality.

(10) Description of Inspection and Maintenance Methods - Description of inspection and maintenance methods implemented at the site to maintain all BMPs identified in the SWMP and Items not addressed in the design

(11) Spill Response Plan - Reports of reportable spills submitted to CDPHE

(12) List and Evaluation of Potential Pollutants - List of potential pollutants as described in subsection 107.25 and approved Method Statement for Containing Pollutant Byproducts.

(13) Other Correspondence e.g., agreements with other MS4s, approved deferral request, CDPHE audit documentation, Water Quality Permit Transfer to Maintenance Punch List and other miscellaneous documentation.

(14) TECS Certifications of the SWMP Administrator and all ECIs, keep current through the life of the project.

(15) Environmental Pre-construction Conference – Conference agenda with a certification of understanding of the terms and conditions of the CDPS-SCP and SWMP. The certification shall be signed by all attendees. A certification shall also be signed by all attendees of meetings held for new subcontractors beginning work on the project that could adversely affect water quality after the Environmental Pre-construction Conference has been held.

(16) All Project Environmental Permits - All project environmental permits and associated applications and certifications, including, CDPS-SCP, Senate Bill 40, USACE 404,temporary stream crossings, dewatering, biological opinions and all other permits applicable to the project, including any separate CDPS-SCP obtained by the Contractor for staging area on private property, asphalt or concrete plant, etc.

(17) Photographs Documenting Existing Vegetation – Project photographs shall be time stamped on paper with a maximum of four colored images per 8 ½ inch by 11 inch sheet and/or a digital copy of all photographs on CD-ROM/Flash Drive in (JPG format), documenting existing vegetation prior to construction commencing. On the bottom of each photograph shall be a description using Station Number or Mile Post of where the photograph was taken.

(18) Permanent Water Quality Plan Sheets - Plan sheets and specifications for permanent water quality structures, riprap.

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The Engineer will incorporate the documents and reports available at the time of award. The Contractor shall provide and insert all other documents and reports as they become available during construction.
The SWMP Administrator shall finalize the SWMP for CDOT Maintenance use upon completion of the project. SWMP completeness shall be approved by the Engineer, corrections to the SWMP shall be at the Contractor's expense. The following Reference materials shall be used:

(1) CDOT Erosion Control and Stormwater Quality Guide.
(2) CDOT Erosion Control and Stormwater Quality Field Guide.

(e) *Weekly Meetings.* The Engineer, Superintendent and the SWMP Administrator shall conduct a weekly meeting with supervisors involved in construction activities that could adversely affect water quality. The meeting shall follow an agenda prepared by the Engineer or a designated representative, and have a sign in sheet on which the names of all attendees shall be recorded. The SWMP Administrator shall take notes of water quality comments and action items at each weekly meeting, and place the agenda and sign in sheet in the SWMP notebook. At this meeting the following shall be discussed and documented on Form 1176:

(1) Requirements of the SWMP.
(2) Problems that may have arisen in implementing the site specific SWMP or maintaining BMPs.
(3) Unresolved issues from inspections and concerns from last inspection
(4) BMPS that are to be installed, removed, modified, or maintained.
(5) Planned activities that will effect stormwater in order to proactively phase BMPs.
(6) Recalcitrant inspection findings

All subcontractors who were not in attendance at the Environment Pre-construction conference shall be briefed on the project by the Engineer, Superintendent, and the SWMP Administrator prior to start of work. The SWMP Administrator shall record the names of these subcontractors as an addendum to the list of attendees, and added the SWMP Notebook.

208.04 Best Management Practices (BMPs) for Stormwater.

The SWMP Administrator shall modify the SWMP to clearly describe and locate all BMPs implemented at the site to control potential sediment discharges.

Vehicle tracking control shall be used at all vehicle and equipment exit points from the site to prevent sediment exiting the Limits of Construction (LOC) of the project site. Access shall be provided only at locations approved by the Engineer. The SWMP Administrator shall record vehicle tracking control pad locations on the SWMP site map.

New inlets and culverts shall be protected during their construction. Appropriate protection of each culvert and inlet shall be installed immediately. When riprap is called for at the outlet of a culvert, it shall be installed within 24 hours of completion of each pipe. The Contractor shall remove sediment, millings, debris, and other pollutants from within the newly constructed drainage system in accordance with the CDPS-SCP, prior to use, at the Contractor's expense. All removed sediment shall be disposed of outside the project limits in accordance with all applicable regulations.

Concrete products wasted on the ground during construction shall include, but shall not be limited to: excess concrete removed from forms, spills, slop, and all other unused concrete are potential pollutants that shall be contained or protected by an approved BMP at a pre-approved containment area.

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The concrete shall be picked up and recycled in accordance with 6 CCR 1007-2 (CDPHE Regulations Pertaining to Solid Waste Sites and Facilities) at regular intervals, as directed. The uses of recycled concrete from approved recycling facilities shall be in accordance with Section 203.

(a) *Unforeseen Conditions.* The Contractor shall design and implement erosion and sediment BMPs for correcting conditions unforeseen during the design of the project, or for emergency situations, that develop during construction. The Department's "Erosion Control and Stormwater Quality Guide" shall be used as a reference document for the purpose of designing erosion and sediment BMPs. Measures and methods proposed by the Contractor shall be reviewed and approved in writing by the Engineer prior to installation.

(b) *Other Agencies.* If CDPHE, US Army Corps of Engineers (USACE), or the Environmental Protection Agency (EPA) reviews the project site and requires additional measures to prevent and control erosion, sediment, or pollutants, the Contractor shall cease and desist activities resulting in pollutant discharge and immediately implement these measures. If the work may negatively affect another MS4, the Contractor shall cease and desist activities resulting in the discharge and shall implement appropriate measures to protect the neighboring MS4, including installing additional measures. . Implementation of these additional measures will be paid for at contract unit price.

(c) *Work Outside the Right of Way.* Disturbed areas, including staging areas, which are outside ROW and outside easements acquired by for construction, are the responsibility of the Contractor. These areas may be subject to a separate CDPS-SCP or other permits. The Contractor shall acquire these permits and submit copies to the Engineer prior to any disturbance. These permits, shall be acquired and all erosion and sediment control work performed at the Contractor's expense. These areas are subject to inspections by the City or any other agency, as agreed upon in writing.

(d) *Construction Implementation*. The Contractor shall incorporate BMPs into the project as outlined in the accepted schedule.

(e) *Stabilization.* Once earthwork has started, the Contractor shall continue erosion BMPs until permanent stabilization of the area has been completed and accepted. Clearing, grubbing and slope stabilization measures shall be performed regularly to ensure final stabilization. Failure to properly maintain erosion control and stabilization methods, either through improper phasing or sequencing will require the Contractor to repair or replace sections of earthwork at his expense. The Contractor shall schedule and implement the following stabilization measures during the course of the project:

(1) Temporary Stabilization. At the end of each day, the Contractor shall stabilize disturbed areas by surface roughening, vertical tracking, or a combination thereof. Disturbed areas are locations where actions have been taken to alter the existing vegetation and/or underlying soil of a site, such as clearing, grading, road bed preparation, soil compaction, and movement and stockpiling of top soils. Other stabilization measures may be implemented, as approved. The maximum area of temporary stabilization shall not exceed 20 acres.

(2) Interim Stabilization. Stockpiles and disturbed areas as soon as known with reasonable certainty that work will be temporarily halted for 14 days or more shall be stabilized using one or more of the specified following methods:

(i) Application of 1.5 tons of mechanically crimped certified weed free hay or straw in combination with an approved organic mulch tackifier.
(ii) Placement of bonded fiber matrix in accordance with Section 213.
(iii) Placement of mulching (hydraulic) wood cellulose fiber mulch with tackifier, in accordance with Section 213.

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(iv) Application of spray-on mulch blanket in accordance with Section 213. Magnesium Chloride, Potassium Chloride and Sodium Chloride, or other salt products, will not be permitted as a stabilization method.

Protection of the interim stabilization method is required. Reapplication may be required as approved.

(3) Summer and Winter Stabilization. Summer and winter stabilization is defined as months when seeding will not be permitted. As soon as the Contractor knows shutdown is to occur, interim stabilization shall be applied to the disturbed area. Protection of the interim stabilization method is required. Reapplication of interim stabilization may be required as directed.

(4) Permanent Stabilization. Permanent stabilization is defined as the covering of disturbed areas with seeding, mulching with tackifier, soil retention coverings, and such non-erodible methods such riprap, road shouldering, etc., or a combination thereof as required by the Contract. Other permanent stabilization techniques may be proposed by the Contractor, in writing, and shall be used when approved in writing by the Engineer. Permanent stabilization shall begin within 48 hours after topsoil placement, soil conditioning, or combination thereof starts and shall be pursued to completion.

(5) Final Stabilization. Final stabilization is defined as when all ground disturbing activities at the site have been completed, and uniform vegetative cover has been established with an individual plant density of at least 70 percent of pre-disturbance levels, or equivalent permanent physical erosion reduction methods have been employed.

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(f) *Maintenance*. Erosion and sediment control practices and other protective measures identified in the SWMP as BMPs for stormwater pollution prevention shall be maintained in effective operating condition until the CDPS-SCP has been transferred to the City. BMPs shall be continuously maintained in accordance with good engineering, hydrologic and pollution control practices, including removal of collected sediment when silt depth is 50 percent or more of the height of the erosion control device. When possible, the Contractor shall use equipment with an operator rather than labor alone to remove the sediment.

Maintenance of erosion and sediment control devices shall include replacement of such devices upon the end of their useful service life as recommended by the Contractor and approved by the Engineer. Maintenance of rock check dams and vehicle tracking pads shall be limited to removal and disposal of sediment or addition of aggregate. Damages resulting from failure to maintain BMPs shall be paid at the contactors expense.

Complete site assessment shall be performed as part of comprehensive inspection and maintenance procedures, to assess the adequacy of BMPs at the site and the necessity of changes to those BMPs to ensure continued effective performance. Where site assessment results in the determination that new or replacement BMPs are necessary, the BMPs shall be installed to ensure continuous effectiveness. When identified, BMPs shall be maintained, added, modified or replaced as soon as possible, immediately in most cases.

Approved new or replaced BMPs will be measured and paid for in accordance with subsections 208.11 and 208.12. Devices damaged due to the Contractor's negligence shall be replaced at Contractor’s expense.

From the time seeding and mulching work begins until the date the Contract work is accepted, the Contractor shall maintain all seeded areas. Damage to seeded areas or to mulch materials shall be immediately restored. Damage to seeded areas or to mulch materials due to Contractor negligence shall be immediately restored at the Contractor’s expense. Restoration of other damaged areas will be measured and paid for under the appropriate bid item.

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Temporary BMPs may be removed upon completion of the project, as determined by the Water Quality Partial Acceptance walk-through. If removed, the area in which these BMPs were constructed shall be returned to a condition similar to that which existed prior to its disturbance. Removed BMPs shall become the property of the Contractor.

If a project delay occurs, the Contractor shall be responsible to continue erosion and sediment control operations beyond the original contract time.

Sediment removed during maintenance of BMPs and material from street sweeping may be used in or on embankment, provided it meets conditions of Section 203 and is distributed evenly across the embankment.

Whenever sediment collects on the paved surface, the surface shall be cleaned. Street washing will not be allowed. Storm drain inlet protection shall be in place prior to shoveling, sweeping, or vacuuming. Sweeping shall be completed with a pickup broom or equipment capable of collecting sediment. Sweeping with a kick broom will not be allowed.

Material from pavement saw cutting operations shall be cleaned from the roadway surface during operations using a vacuum. A BMP, such as a berm, shall be placed to contain slurry from joint flushing operations until the residue can be removed from the soil surface. Aggregate bags, erosion logs or other permeable BMPs shall not be used. Residue shall not flow into driving lanes. It shall be removed and disposed of in accordance with subsection 107.25(b) 13. Material containment and removal will not be paid for separately, but shall be included in the work.

208.05 Construction of BMPs. BMPs shall be constructed in accordance with Standard Plans M-208-1, M-216-1 and with the following.

(a) *Seeding, Mulching, Sodding, Soil Retention Blanket*. Seeding, mulching, sodding, and soil retention blanket shall be performed in accordance with Sections 212, 213, and 216.

(b) *Erosion Bales*. The bales shall be anchored securely to the ground with wood stakes.

(c) *Silt Fence*. Silt fence shall be installed in locations specified in the Contract prior to any grubbing or grading activity.

(d) *Temporary Berms*. Berms shall be constructed to the dimensions shown in the Contract, and sufficiently compacted to prevent erosion or failure. If the berm erodes or fails, it shall be immediately repaired or replaced at the Contractor's expense.

(e) *Temporary Diversion*. Diversions shall be constructed to the dimensions shown in the Contract, and graded to drain to a designated outlet. The berm shall be sufficiently compacted to prevent erosion or failure. If the diversion erodes or fails, it shall be immediately repaired or replaced at the Contractor's expense.

(f) *Temporary Slope Drains*. Temporary slope drains shall be installed prior to installation of permanent facilities or growth of adequate ground cover on the slopes. All temporary slope drains shall be securely anchored to the slope. The inlets and outlets of temporary slope drains shall be protected to prevent erosion.

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(g) *Silt Berm*. Prior to installation of silt berms, the Contractor shall prepare the surface of the areas in which the berms are to be installed such that are they free of materials greater than 2 inches in diameter and are suitably smooth for the installation of the silt berms, as approved. Silt berms shall be secured with spikes. The Contractor shall install the silt berm in a manner that will prevent water from going around or under the silt berm. Silt berms shall be installed on top of soil retention blanket.

(h) *Rock Check Dam*. Rock shall be installed at locations shown on the plans. Rock check dams shall conform to the dimensions shown on the plans.

(i) *Riprap Outlet Protection*. Geotextile used shall be protected from cutting or tearing. Overlaps between two pieces of geotextile shall be 1 foot minimum. Riprap size shall be as shown on the plans.

(j) *Storm Drain Inlet Protection*. Prior to installation, the Contractor shall sweep the surface of the area in which the storm drain inlet protection devices are to be installed such that the pavement is free of sediment and debris. The ends of the inlet protection Type 1 and Type 2 shall extend a minimum of 1 foot past each end of the inlet.

The Contractor shall remove all accumulated sediment and debris from the surface surrounding all storm drain inlet protection devices after each rain event or as directed. The Contractor shall remove accumulated sediment from Type II and III containment area when it is more than a maximum one third full of sediment, or as directed.

The Contractor shall protect storm drain facilities adjacent to locations where pavement cutting operations involving wheel cutting, saw cutting, sand blasting, or abrasive water jet blasting are to take place.

(k) *Sediment Trap*. Sediment traps shall be installed to collect sediment laden water and to minimize the potential of pollutants leaving the project site. Locations shall be as shown on the plans or as directed.

Sediment traps shall be constructed prior to disturbance of upslope areas and shall be placed in locations where runoff from disturbed area can be diverted into the trap.

The area under the embankment shall be cleared, grubbed and stripped of any vegetation and roots.

Fill material for the embankment shall be free of roots or other vegetation, organic material, large stones, and other objectionable material.

Sediment shall be removed from the trap when it has accumulated to one half of the wet storage depth of the trap and shall be disposed of in accordance with subsection 208.04(f).

(l) *Erosion Logs*. Erosion logs shall be embedded 2 inches into the soil. Stakes shall be embedded to a minimum depth of 12 inches. At the discretion of the Engineer, a shallower depth may be permitted if rock is encountered.

The Contractor shall maintain the erosion logs during construction to prevent sediment from passing over or under the logs.

(m) *Silt Dikes*. Prior to installation of silt dikes, the Contractor shall prepare the surface of the areas in which the silt dikes are to be installed such that they are free of materials greater than two inches in diameter and are suitably smooth for the installation of the silt dikes, as approved by the Engineer.

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(n) *Concrete Washout Structure*. The concrete washout structure shall meet or exceed the dimensions shown on the plans or be used in accordance with manufacturer's recommendations. Work on this structure shall not begin until written acceptance is provided by the Engineer.

Concrete washout structure shall conform to standard plan M-208-1 and shall meet the following requirements:

(1) Structure shall contain all washout water.

(2) Stormwater shall not carry wastes from washout and disposal locations.

(3) The site shall be located a minimum of 50 horizontal feet from State waters and shall meet all requirements for containment and disposal as defined in subsection 107.25.

(4) The site shall be signed as "Concrete Washout".

(5) The site shall be accessible to appropriate vehicles.

(6) Freeboard capacity shall be included into structure design to reasonably ensure the structure will not overtop during or because of a precipitation events.

(7) The Contractor shall prevent tracking of washout material out of the washout structure.

(8) Solvents, flocculents, and acid shall not be added to wash water.

(9) The structure shall be surrounded on three sides by a compacted berm.

(10) The structure shall be fenced with orange plastic construction fencing to provide a barrier to construction equipment and to aid in identification of the concrete washout area.

(11) Concrete waste, liquid and solid, shall not exceed 2/3 the storage capacity of the washout structure.

Pre-fabricated concrete washout structures shall meet the following requirements:

(1) Structure shall contain all washout water.

(2) Structure shall be located 50 horizontal feet away from State waters, and shall be confined so that no potential pollutants will enter State waters and other sensitive areas are as defined in the Contract. Locations shall be as approved by the Engineer. The site shall be delineated with orange plastic fence or other means and signed as "Concrete Washout".

(3) The site shall be accessible to appropriate vehicles.

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(4) Freeboard capacity shall be included into structure design to reasonably ensure the structure will not overtop during or because of a precipitation event.

(5) Solvents, flocculants, and acid shall not be added to wash water.

(6) Concrete waste, liquid and solid, shall not exceed 2/3 the storage capacity of the washout structure.

(7) Prefabricated structures cannot be moved when they contain liquid, unless otherwise approved.

(8) The concrete washout structure shall be completed and ready for use prior to concrete placement operations.

(9) Washout areas shall be checked and maintained as required. On site permanent disposal of concrete washout waste is not allowed.

All liquid and solid wastes, including contaminated sediment and soils generated from concrete washout shall be hauled away from the site and disposed of properly at the Contractor's expense.

(o) *Vehicle Tracking Pad (VTP)*. Vehicle tracking pads shall be constructed to the minimum dimensions shown in the Contract, unless otherwise directed by the Engineer. Construction of approved vehicle tracking pads shall be completed before any disturbance of the area.

The Contractor shall maintain each vehicle tracking pad during the entire time that it is in use for the project. The vehicle tracking pad shall be removed at the completion of the project unless otherwise directed by the Engineer. Additional aggregate may be required for maintenance and will be paid for under Pay Item, Maintenance Aggregate (Vehicle Tracking Pad).

(p) *Detention Pond*. Permanent detention ponds shown on the construction plans may be used as temporary BMPs if all the following conditions are met:

(1) The pond is designated as a construction BMP in the SWMP.

(2) The pond outfall and outlet are designed and implemented for use as a BMP during construction in accordance with good engineering, hydrologic, and pollution control practices. The stormwater discharges from the outfall shall not cause degradation or pollution of State waters, and shall have BMPs, as appropriate.

(3) All silt shall be removed and the pond returned to the design grade and contour prior to project acceptance

(q) *Aggregate Bag*. Aggregate bags shall be placed on a stable surface, consisting of pavement, grass or gravel. Aggregate bags shall be placed to conform to the surface without gaps. Discharge water shall not cause erosion.

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(r) *Surface Roughening*. Surface roughening creates horizontal grooves along the contour of the slope. Roughening may be accomplished by furrowing, scarifying, ripping or disking the soil surface to create a 2 to 4 inch minimum variation in soil surface. Surface roughening will not be paid for separately, but shall be included in the work.

(s) *Vertical Tracking*. Vertical tracking involves driving a tracked vehicle up and down the soil surface and creating horizontal grooves and ridges along the contour of the slope. Sandy soils or soils that are primarily rock need not be tracked. Vertical tracking will not be paid for separately, but shall be included in the work.

208.06 Materials Handling and Spill Prevention. The SWMP Administrator shall clearly describe and record on the SWMP, all practices implemented at the site to minimize impacts from procedures or significant material that could contribute pollutants to runoff. Areas or procedures where potential spills can occur shall have a Spill Response Plan in place as specified in subsections 107.25(b) 6 or 208.06(c). Construction equipment, fuels, lubricants, and other petroleum distillates shall not be stored or stockpiled within 50 horizontal feet of any State waters or more if the Contractor determines necessary. Equipment fueling and servicing shall occur only within approved designated areas.

(a) *Bulk Storage Structures.* Bulk storage structures for petroleum products and other chemicals shall have impervious secondary containment or equivalent adequate protection so as to contain all spills and prevent any spilled material from entering State waters. Secondary containment shall be capable of containing the combined volume of all the storage containers plus at least 10 percent freeboard. For secondary containment that is used and may result in accumulation of stormwater within the containment, a plan shall be implemented to properly manage and dispose of all accumulated stormwater which is deemed to be contaminated (e.g., has an unusual odor or sheen).

(b) *Lubricant Leaks.* The Contractor shall inspect equipment, vehicles, and repair areas daily to ensure petroleum, oils, and lubricants (POL) are not leaking onto the soil or pavement. Absorbent material or containers approved by the Engineer shall be used to prevent leaking POL from reaching the soil or pavement. The Contractor shall have onsite approved absorbent material or containers of sufficient capacity to contain any POL leak that can reasonably be foreseen. The Contractor shall inform all Spill Response Coordinators in accordance with the Spill Response Plan if unforeseen leakage is encountered. All materials resulting from POL leakage control and cleanup shall become the property of the Contractor and shall be removed from the site. Control, cleanup, and removal of by-products resulting from POL leaks shall be performed at the Contractor's expense.

(c) *Spill Response Plan*. A spill Response Plan shall be developed and implemented to establish operating procedures for handling potential pollutants and preventing spills.

The Response Plan shall contain the following information:

(1) Identification and contact information of each Spill Response Coordinator

(2) Locations of areas on project site where equipment fueling and servicing operations are permitted.

(3) Location of cleanup kits.

(4) Quantities of chemicals and locations stored on site.

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(5) Label system for chemicals and Safety Data Sheets (SDS) for products.

(6) Clean up procedures to be implemented in the event of a spill that does not enter State waters or ground water.

(7) Procedures for spills of any size that enter surface waters or ground water, or have the potential to do so. CDOT's Erosion Control and Stormwater Quality Guide contains Spill notification contacts and phone numbers required in the Spill Response Plan.

(8) A summary of the employee training provided.

Information in items (1) through (8) shall be updated in the SWMP Notebook when they change.

208.07 Stockpile Management. Material stockpiles shall be located 50 horizontal feet away from State waters, and shall be confined so that no potential pollutants will enter State waters and other sensitive areas as defined in the Contract. Locations shall be approved by the Engineer.

Erodible stockpiles (including topsoil) shall be contained with acceptable BMPs at the toe (or within 20 feet of the toe) throughout construction. BMPs shall be approved by the Engineer. The SWMP Administrator shall describe, detail, and record the sediment control devices on the SWMP.

208.08 Limits of Disturbance. The Contractor shall limit construction activities to those areas within the limits of disturbance shown on the plans and cross-sections. Construction activities, in addition to the Contract work, shall include the on-site parking of vehicles or equipment, on-site staging, on-site batch plants, haul roads or work access, and all other action which would disturb existing soil conditions. Staging areas within the LDA shall be as approved by the Engineer. Construction activities beyond the limits of disturbance due to Contractor negligence shall be restored to the original condition by the Contractor at the Contractor's expense. The SWMP Administrator shall tabulate additional disturbances not identified in the CDPS_SCP application and indicate changes to locations and quantities on the SWMP. The Contractor shall report the changes and additional disturbances to the Engineer, Water Quality Control Division of CDPHE and all other involved agencies.

The Contractor shall pursue and stabilize all disturbances to completion.

208.09 Failure to Perform Erosion Control. Failure to implement the Stormwater Management Plan is a violation of the CDPS – SCP and specifications. Penalties may be assessed to the Contractor by the appropriate agencies. Penalties will be assessed by the City as liquidated damages for failure to meet the Permit. All fines assessed to the City for the Contractor's failure to implement the SWMP will be deducted from moneys due the Contractor in accordance with subsection 107.25(c) 2.

The Contractor will be subject to liquidated damages for incidents of failure to perform erosion control as required by the Contract. Liquidated damages will be applied for failure to comply with the CDPS-SCP and these specifications, including the following:

(1) Failure to include erosion control in the project schedule or failure to include erosion control in each schedule update as specified in subsection 208.03(b).

(2) Failure of the Contractor to perform the inspections required by subsection 208.03(c) 2.

(3) Failure of the Contractor to implement necessary actions required by the Engineer as required by subsection 208.03(c).

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(4) Failure to amend the SWMP and implement BMPs as required by subsection 208.04.

(5) Failure to keep documentation and records current.

(6) Failure to construct or implement erosion control or spill containment measures required by the Contract, or failure to construct or implement them in accordance with the Contractor's approved schedule as required by subsection 208.06(c).

(7) Failure to limit temporary stabilization to 20 or fewer acres as required by subsection 208.04 (e).

(8) Failure to replace or perform maintenance on an erosion control feature after notice from the Engineer or from a water quality inspection as required by subsection 208.04(f).

(9) Failure to remove and dispose of sediment from BMPs as required.

(10) Failure to install and properly utilize a concrete washout structure for containing washout from concrete placement operations.

(11) Failure to perform stabilization as required by subsection 208.04 (e).

(12) Failure of the Superintendent or designated representative to attend inspections as required by subsection 208.03(c) and record findings in the appropriate form.

(13) Failure to prevent discharges not composed entirely of stormwater from leaving the Construction Site.

(14) Failure to provide the survey of Permanent Water Quality BMPs when required on the project in accordance with 208.10.

The Engineer will immediately notify the Contractor of each incident of failure to perform erosion control in accordance with the CDPS-SCP and these specifications, including items (1) through (14) above by issuing the Form 105. Correction shall be made as soon as possible but no later than 48 hours from the date of notification to correct the failure. The Contractor will be charged liquidated damages in the amount of $970 for each day after the 48 hour period has expired, that one or more of the incidents of failure to perform the requirements for each Form 105 remains uncorrected. Liquidated damages will begin at Midnight of the date the 48 hours has expired.

This deduction will not be considered a penalty, but will be considered liquidated damages based on estimated additional construction engineering costs. The liquidated damages will accumulate, for each cumulative day that one or more of the incidents remain uncorrected. The number of days for which liquidated damages are assessed will be cumulative for the duration of the project; that is: the damages for a particular day will be added to the total number of days for which liquidated damages are accumulated on the project. The liquidated damages will be deducted from any monies due the Contractor.

If all other failures are not corrected within 48 hours after liquidated damages have begun to be assessed, the Engineer will issue a Stop Work Order in accordance with subsection 105.01. Work shall not resume until the Engineer has approved a written corrective action plan submitted by the Contractor that includes measures to prevent future violations and a schedule for implementation.

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If the Contractor requires more than 96 hours to perform the corrective work from the date on the Form 105, the Contractor shall submit a request for deferment. The deferment request shall be in writing and shall include the specific failure, temporary measures until final correction is made, the methodology which will be employed to make the correction and interim milestones to completing the work. The Region Water Pollution Control Manager (RWPCM), Engineer, the SWMP Administrator and the Contractor shall concur on this deferral and set a proposed date of completion. If approved, the Contractor shall complete the corrective measures by Midnight of the proposed completion date. If corrective work is not corrected by the completion date the Engineer will issue a Stop Work Order. Liquidated Damages will apply retroactively back to the 48 hours after the 105 date of notification. Liquidated Damages will assessed until the corrective work has been completed and accepted.

Deferment of work to correct failures to perform erosion control will not affect the Contractor's other contractual responsibilities, notifications for other non-compliance, nor the final completion date of the project. Liquidated Damages for other non-compliance notifications will continue to apply during the deferment period in addition to liquidated damages associated with the deferment.

Based on the submittal date of the approved deferment Liquated Damages and a Stop Work Order may not be mandated to the Contractor.

Disagreements regarding the suggested corrective action for a BMP compliance issue between the Project Engineer, SWMP Administrator, and Superintendent, shall be discussed with the Resident Engineer and Region Water Pollution Control Manager. If after the discussions, the Project Engineer and the Contractor are still in disagreement and feel that additional compensation is owed, the Contractor will follow the decision of the Project Engineer, keep track of the costs and negotiate further with the Project Engineer. If after pursuing the issue, the Contractor is unable to reach agreement with the Project Engineer, then the Contractor can follow the dispute process outlined in subsection 105.22.

If the Contractor's corrective action plan and schedule are not submitted and approved within 96 hours of the initial notice, the Engineer will issue a Stop Work Order and have an on-site meeting with the Superintendent, SWMP Administrator, and the Superintendent's supervisor. This meeting will also be attended by the Resident Engineer, the Region Water Pollution Control Manager, and the Region Program Engineer. This meeting will identify and document needed corrective actions and a schedule for completion. If after the meeting, the unacceptable work is not remedied within the schedule as agreed to in the meeting, the Engineer will take action to effect compliance with the CDPS-SCP and these specifications by utilizing CDOT Maintenance personnel or other non-Contractor forces and deduct the cost from any moneys due or to become due to the Contractor pursuant to subsection 105.17. Delays due to these Stop Work Orders shall be considered non-excusable. The Stop Work Order shall be in place until the project is in CDPS-SCP compliance.

If the Contractor remains non-responsive to requirements of the on-site meeting, the Engineer will start default or Contract termination procedures in accordance with subsections 108.09 and 108.10.CDOT will proceed with corrective or disciplinary action in accordance with the Rules for Prequalification, Debarment, Bidding and Work on Transportation, Road, Highway and Bridge Public Projects.

When a failure meets any one of the following conditions, the Engineer will immediately issue a Stop Work Order in accordance with subsection 105.01 irrespective of any other available remedy:

(1) It may endanger health or the environment.

(2) It consists of a spill or discharge of hazardous substances or oil which may cause pollution of the waters of the state.

(3) It consists of a discharge which may cause a violation of a water quality standards.

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208.10 Items to Be Completed Prior to Requesting Partial Acceptance of Water Quality Work.

(a) *Reclamation of Washout Areas.* After concrete operations are complete, washout areas shall be reclaimed in accordance with subsection 208.05(n) at the Contractor's expense.

(b) *Survey.* When Permanent Water Quality BMPs (Permanent BMP) are required on the project, the Contractor shall survey the BMPs to confirm that they conform to the configuration and grade shown on the Plans. The survey shall conform to Section 625. The results of the survey shall be submitted as Microstation or AutoCad drawing files and PDF files, showing both designed and final elevations and configurations. Paper versions of the drawings shall be submitted with the stamp and seal of the Contractor's Surveyor.

The Engineer will perform a walkthrough of the Permanent BMPs to confirm conformance to material requirements, locations and dimensions of the Permanent BMPs. Permanent BMPs not meeting the Contract requirements will be identified in writing by the Engineer, and shall be repaired or replaced at the Contractor's expense. Correction surveys shall be performed at the Contractor's expense to confirm the locations and dimensions of each Permanent BMP. Final as-built plans of the Permanent BMPs shall be provided to the Engineer for their records.

(c) *Locations of Temporary BMPs.* The Engineer will identify locations where modification, cleaning or removal of temporary BMPs are required, and will provide these in writing to the Contractor. Upon completion of work required, the SWMP Administrator shall modify the SWMP to provide an accurate depiction of BMPS to remain on the project site.

METHOD OF MEASUREMENT

208.11 Erosion Control Management will be measured by the lump sum for work performed onsite, regardless of the number of ECIs required, including erosion control inspections, documentation, meeting participation, SWMP Administration, and the preparation of the SWMP notebook.

Erosion control and BMP's will be measured as a lump sum. Place BMPs according to approved SWMP. No separate measurement will be made for any labor, equipment, or materials required to place or maintain BMPs. Furnish and install all materials including concrete washout areas, inlet protection, outlet protection, silt fence, curb socks, sediment control logs, vehicle tracking control, and any other materials required according to the approved SWMP.

BASIS OF PAYMENT

208.12 Erosion and Sediment Control and BMPs will be paid for at the Contract unit price for each of the items listed below that appear in the bid schedule.

Payment will be made under:

Pay Item	**Pay Unit**
Erosion and Sediment Control	Lump Sum

Erosion and Sediment Control will be full compensation for all labor, management, materials and equipment necessary for the SWMP Administrator and Erosion Control Inspectors to perform all the work described in this specification. This includes assembling items 5-19 and required updates to the SWMP Notebook on site.

Modifications to the SWMP Notebook due to construction errors or survey errors by the contractor shall be at the Contractor's expense.

Stakes, anchors, connections, geotextile, riprap and tie downs used for temporary slope drains will not be measured and paid for separately, but shall be included in the work.

Permanent seeding and mulching required in Section 212 will not be measured for payment but shall be included in the cost of Erosion and Sediment Control item.

All work and materials required to perform the permanent BMP survey and furnish the electronic files shall be included in the original unit price bid for surveying. Surveying will be measured and paid for in accordance with Section 625.

REVISION OF SECTION 209
WATER AND DUST PALLIATIVES

CONSTRUCTION REQUIREMENTS

Subsection 209.05 shall include the following:
Magnesium Chloride may be used as a dust palliative as directed by the Engineer.

METHOD OF MEASUREMENT

Delete Subsection 209.07 and substitute the following:

209.07 Watering for dust control will not be measured for payment but shall be included in the work.

Magnesium Chloride dust palliative will be measured by the number of gallons applied and accepted as directed by the engineer.

REVISION OF SECTION 210
VALVE BOX AND MANHOLE ADJUSTMENTS

Section 210 of the Standard Specifications is hereby revised for this project as follows:

Subsection 210.10 shall include the following:

The Contractor shall notify each utility company (Owner) prior to any construction that will involve the adjustment of its valve boxes or manholes.

Each Owner will mark all of its valve boxes and manholes that will be involved in the specified construction area.

Prior to commencing construction, the Contractor shall coordinate and conduct, with the Engineer and each Owner, an inspection of all impacted manholes and valve boxes. The purpose of this inspection will be to account for all valve boxes and manholes involved in the construction and determine their accessibility and condition. The Contractor shall provide traffic control for this inspection and for the final inspection. The Contractor shall coordinate construction with the Owner to allow sufficient time for the Owner to make all necessary repairs to valve boxes and manholes before construction begins in the area of the valve boxes and manholes. All parties shall agree on the condition of each valve box and manhole prior to construction.

The Contractor shall replace all valve box sections damaged or misplaced during construction with new valve box sections complying with the requirements of the Owner's specifications. The Contractor shall set each

valve box to be adjusted so that it is ¼ inch below the final grade of the paved surface, or to the satisfaction of the Owner, and so that it is plumb over the operating nut of the valve.

The Contractor shall adjust all manholes that require adjustment with materials conforming to the Owner's specifications. Some adjustments may require the addition, removal, or replacement of a manhole or cone section. If manhole adjustment requires a manhole cone or barrel section to be added, removed, or replaced, this work will not be considered as "Adjust Manhole", but shall be performed in accordance with the Section 210 requirements for the item "Modify Manhole".

The Contractor shall prevent tools, concrete, dirt, or debris of any kind from falling into the channel of the existing manhole. The Contractor shall clean or remove debris from downstream sewer that enters as a result of the Contractor's work.

When the project includes planning prior to resurfacing, the Contractor shall first lower all valve boxes and manholes below the surface to be planed and then adjust them up to final grade after the paving operation is complete. If required this work shall not be measured and paid for separately, but shall be included in the work.

Prior to the final inspection, the Contractor shall thoroughly clean all valve boxes designated for cleaning. This work shall be performed in accordance with the Section 202 requirements for the item "Clean Valve Box". If required this work shall not be measured and paid for separately, but shall be included in the work.

The Contractor shall coordinate and conduct, with the Engineer and each Owner, a final inspection upon completion of construction. This inspection shall assure that all valve boxes and manholes are in compliance with these requirements. The Engineer will obtain the Owner's written approval before accepting the work.

Subsection 210.10 shall include the following:

GPS and photo all gate valves and manhole lids prior to placing the first lift of Asphalt in order to record the position of structures that will be adjusted to the final grade.

Subsection 210.12 shall include the following:

Compensation for Modification or Adjustment of Manholes and Valves will only be made for adjustments to existing structures that are not replaced as part of other work items. The Contractor will be paid separately for each valve box or manhole adjustment completed down and for each adjustment completed up. No compensation will be made for GPS or Photo log of the structures.

Subsection 210.13 shall include the following:

Pay Item	**Pay Unit**
Adjust Manhole	Each
Modify Manhole	Each
Adjust Valve Box	Each

REVISION OF SECTION 211
DEWATERING

DESCRIPTION

Groundwater may be encountered during subsurface construction activities. Water from dewatering operations shall not be directly discharged into any waters of the State, including wetlands, irrigation ditches, canals, or storm sewers, unless allowed by a permit. Therefore, the Contractor will be responsible for managing groundwater brought to the surface in accordance with the Colorado Department of Public Health and Environment (CDPHE)-Water Quality Control Division (WQCD) permits for dewatering and discharge.

In the event that groundwater is encountered, it will be immediately containerized until a management method has been determined. Unless prohibited by law or otherwise specified in the Contract, the water from dewatering operations shall be contained in basins in locations approved by the engineer. The Contractor may, at his choosing, manage the groundwater using one of the following methods (outlined in Idaho Springs' order of preference):

1. Avoid dewatering if logistically practicable;
2. Treat containerized water for discharge in accordance with the CDPHE-WQCD permit(s); or
3. Haul away from the project for proper disposal in accordance with applicable laws and regulations.

Regardless of the methodology used to manage groundwater, the Contractor is encouraged to minimize dewatering wherever practicable or avoid dewatering completely and thus avoiding the need to treat, haul, or otherwise manage the groundwater.

Although these options are presented, the CDPHE-WQCD permit(s) requirements take precedence to the project specifications. Evaluation of water disposition will be conducted in coordination with the MMP Supervisor and Idaho Springs. If results of sampling indicate that groundwater has been impacted at concentrations exceeding the appropriate CDPHE standard, the Contractor must understand that the CDPHE will not allow this water to be discharged without appropriate permitting and/or treatment. The project has implemented, in accordance with subsection 109.04 of the contract documents, a Force Account – Dewatering. Payment of the Force Account – Dewatering will only be made if testing indicates that the ground water is contaminated or exceeds regulated effluent limits and must be hauled away from the project site due to permit requirements. No payment will be made for treating or remediating for discharge on site.

It is the responsibility of the Contractor to obtain all applicable CDPHE-WQCD permits for dewatering and discharge of groundwater, and to abide by the requirements of the permit(s). The Contractor shall apply for and obtain a CDPS General Permit for Construction Dewatering (COG0700000) from the CDPHE-WQCD if groundwater will require management. This application must be submitted to CDPHE at least 30 days prior to dewatering activities. If the Contractor intends to treat groundwater for discharge into a waters of the State (e.g., Clear Creek), the Contractor may need to apply for and obtain a Remediation Activities Discharge to Surface Water permit (COG315000). If so, this application must be submitted at least 45 days prior to the anticipated date of discharge, and must be considered complete by the CDPHE before the CDPHE review and approval process begins. An application for remediation would need to concisely show how the Contractor intends to treat the water to meet the surface-water standards applicable for the discharge. In the case that dewatering activities are required and a permit is obtained, the Contractor must prepare a Remediation Activities Management Plan (RAMP) prior to any discharge activities taking place.

In accordance with permit procedures, the Contractor shall fill out and submit monthly Discharge Monitoring Reports (DMRs) to CDPHE-WQCD for the life of the permit. Copies of monthly submittals shall be provided to Bruce Tonilas, Resident Engineer, HDR, 1670 Broadway, Suite 3400, Denver, CO 80202-4824. See the MMP for additional information on the management of groundwater.

The Contractor shall comply with Section 250 – Environmental, Health and Safety Management specification. Any requirements noted on the CDPHE-WQCD permit(s) apply.

BASIS OF PAYMENT

Dewatering as described above will not be measured for payment unless it meets the requirements for payment by planned Force Account – Dewatering, as described above.

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

Section 212 of the Standard Specifications is hereby revised for this project as follows:

In subsection 212.02 (b) delete the 3rd paragraph and replace with the following:

> Soil conditioning shall be derived from a variety of sources including agricultural, bio solids, forestry, food, leaf and yard trimmings, manure, and tree wood.

In subsection 212.02 (b), 4th paragraph.

In subsection 212.02 (b), delete the 5th paragraph and replace with the following:

COMPOST PARAMETERS	REPORTED AS	REQUIREMENTS	TEST METHOD
pH	pH Units	6.0 - 8.5	TMECC 04-11-A
Soluble Salts (Electrical Conductivity)	mmhos/cm	Maximum 10 dS/m	TMECC 04.10-A
Organic Matter Content	%, Dry Matter Basis	20%-60%	TMECC 05.07-A
Particle Size (Sieve Sizes)	% dry weight basis for each sieve fraction	Passing 1 inch - 100% 1/2 inch - 95%	TMECC 02.02-B
Ammonium-N/Nitrate-N-Ratio	Dry Matter Basis	ratio of < 4	Calculation
Plant Available phosphorus, potassium, zinc, iron, manganese, copper	Dry Matter Basis	level of nutrients must exceed a medium range	AB-DTPA

The contractor shall provide a soil test, performed by an agency pre-approved by the Engineer, completed within 90 days prior to beginning use of material, confirming that the material has been tested in accordance with Test Methods for Examination of Composting and Compost (TMECC).
Delete subsection 212.02 (c) Sod.

Subsection 212.06, 3rd paragraph, delete the 5th sentence and replace with the following:

Soil conditioner shall be applied uniformly over the soil surface and incorporated into the top 8” of topsoil. Soil conditioner shall be applied at the rate shown in the plans in areas consisting of native seeding and trees.

In Subsection 212.07, 1st paragraph, delete the 1st sentence and replace with the following:

The quantities of native seeding will not be measured but shall be the quantities designated in the Contract. Measurements will be made for revisions requested by the Engineer, or for discrepancies of plus or minus five percent of the total quantity designated in the Contract.

In Subsection 212.07, 1st paragraph shall include the following:

Seeding, soil conditioning, and mulching will not be measured for payment. Include the cost of these items in the Erosion and Sediment Control (LS) Item.

SECTION 250
ENVIRONMENTAL, HEALTH AND SAFETY MANAGEMENT

Section 250 of the Standard Specifications is hereby deleted for this projected and replaced with the following:

DESCRIPTION

250.01 This work consists of protection of the environment, persons, and property from contaminants that may be encountered on the Project. This includes monitoring the work for encounters with contaminants or suspected soil and groundwater contaminants; the management of solid, special, and hazardous waste; and management of visual emissions associated with hazardous waste, when encountered on the project.

250.02 The Contractor shall furnish all personnel, materials, equipment, laboratory services and traffic control necessary to perform the contamination monitoring, testing, and site remediation when required. Traffic control shall be in accordance with the requirements of Section 630.

Monitoring equipment used to detect flammable gas, oxygen level, and toxic gas shall be capable of detection to meet the following standards:

Instrument Detection		
Constituent	**Threshold Limit**	**Increments**
Flammable Gas	1% LEL	1%
Oxygen	19%	0.1%
Toxic Gas	1 PPM	1 PPM
LEL = lower explosive limit PPM = parts per million		

CONSTRUCTION REQUIREMENTS

250.03 General. Prospective bidders, including subcontractors, are required to review the environmental documents available for this project. These documents are listed in subsection 102.05 as revised for this project.

This project may be in the vicinity of property associated with petroleum products, heavy metal based paint, landfill, buried foundations, abandoned utility lines, industrial area or other sites which can yield hazardous substances or produce dangerous gases. These hazardous substances or gases can migrate within or into the construction area and could create hazardous conditions. The Contractor shall use appropriate methods to reduce and control known landfill, industrial gases, and visible emissions from asbestos encounters and hazardous substances which exist or migrate into the construction area. The Contractor shall follow CDOT's *Asbestos-Contaminated Soil Management Standard Operating Procedure, dated August 22, 2011* for proper handling of asbestos-contaminated soil, and follow all applicable Solid and Hazardous Waste Regulations for proper handling of soils encountered that contain any other substance mentioned above.

Encountering suspected contaminated material, including groundwater, old foundations, building materials, demolition debris, or utility lines that may contain asbestos or be contaminated by asbestos, is possible at some point during the construction of this project. When suspected contaminated material, including groundwater, is encountered or brought to the surface, the procedures under subsection 250.03(d) and 250.05 shall be followed.

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SECTION 250
ENVIRONMENTAL, HEALTH AND SAFETY MANAGEMENT

Transportation of waste materials on public highways, streets and roadways shall be done in accordance with Title 49, Code of Federal Regulations (CFR). All labeling, manifesting, transportation, etc. of waste materials generated on this project shall be coordinated with the Engineer. All hazardous waste manifests for waste materials generated on this project shall list the Colorado Department of Transportation as the generator of the waste materials except as otherwise noted. If the Contractor contaminates the site, the Contractor shall be listed as the generator on the hazardous waste manifests, permits, and other documents for such material. If the project is not on a State Highway or frontage road, then the appropriate local governmental entity having jurisdiction over the transportation system facility shall be listed as the hazardous waste generator.

If waste materials must be handled in a permitted treatment, storage and disposal (TSD) facility, the facility shall be designated in writing by the Engineer. If the waste materials are the result of the Contractor's actions, the Contractor shall designate the facility.

The hazardous waste transportation phase of the work involves insurance required by law and regulations. If the waste materials are determined to be hazardous, the Contractor must submit proof that the transportation company is covered by the appropriate type and amount of insurance required by laws and regulations governing the transportation of hazardous waste.

The Contractor alone bears the responsibility for determining that the work is accomplished in strict accordance with all applicable federal, state and local laws, regulations, standards, and codes governing special waste, petroleum and hazardous substance encounters and releases.

The Contract will list known or suspected areas of contamination. Health and Safety Officer, Monitoring Technician, and Health and Safety Plan shall be required when so stated in the Contract.

(a) *Health and Safety Officer (HSO).* The Contractor shall designate a HSO, not the project superintendent, who shall have at least two years field experience in chemical related health and safety. The HSO shall be either a certified industrial hygienist (CIH), certified hazardous materials manager (CHMM), professional engineer (PE) licensed in the State of Colorado, certified safety professional (CSP), or registered environmental manager (REM) meeting the criteria set forth in 29 CFR 1926. When asbestos is present or is suspected to be present, the HSO shall have additional training and certification in accordance with the Air Quality Control Commission Regulation No. 8 Part B. The HSO shall meet the minimum training and medical surveillance requirements established by the Occupational Safety and Health Administration (OSHA) and the Environmental Protection Agency (EPA) for a supervisory Site Safety Official per 29 CFR 1962.65. The Contractor shall furnish documentation to the Engineer, at the preconstruction conference, that the above requirements have been met. 250.03.

The HSO shall *be* equipped with the following:

(1) Communication equipment as required in subsection 250.03(d)2.A. and a vehicle.

(2) Monitoring and detection equipment for flammable gas, oxygen sufficiency, toxic gas, radiological screening and other hazards. This includes, as required, a combustible gas indicator, flame ionization or photo ionization detector, oxygen meter, radiation monitor with Geiger Mueller detector and other foreseeable equipment.

(3) Depth gauging equipment, sampling equipment and sampling containers.

(4) Personal protective equipment (levels C and D) when required.

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SECTION 250
ENVIRONMENTAL, HEALTH AND SAFETY MANAGEMENT

The HSO shall recommend and supervise those actions which will minimize the risk of hazardous substance related injury to the workers, Department personnel, the general public, property and the environment. Hazardous substance is defined in 29 CFR 1926.32. The HSO shall prepare written procedures for the monitoring of confined space entry and working in or near excavations, including but not limited to trenches and drill holes associated with this project. The HSO shall conduct or supervise all hazardous substance and solid waste related testing, sampling, monitoring and handling for this project to ensure compliance with applicable statutes and regulations, and other applicable environmental requirements under subsections 107.01 and 107.02.

The HSMT shall be available for consultation and assistance with contaminated materials related testing, sampling, and field monitoring as required by the Engineer.

The HSMT shall prepare and submit a bound and indexed final site report to the Engineer at the end of the project. This site report shall include a detailed summary of all contaminated materials and contaminated water that were encountered and their final disposition.

During each week the HSMT is utilized, the HSMT shall prepare a daily diary which shall be submitted to the Contractor and the Engineer. This diary shall be submitted at the end of the week and shall become a part of the Department's records. The diary shall contain a chronological log of activities on the project including: dates and times on site, equipment used and calibrations, field monitoring results, visual observations, conversations, directives both given and received, and disposition of suspected hazardous substances.

(b) *Health and Safety Monitoring Technician (HSMT).* The Contractor shall designate a monitoring technician to be responsible for monitoring of hazardous substances during work on the project. The HSMT shall have a minimum of two years of actual field experience in assessment and remediation of hazardous substances that may be encountered during highway construction projects. The HSMT shall be experienced in the operation of monitoring devices, identifying substances based upon experience and observation, and field sampling (for testing) of all media that may be found on the site. Completion of the 40 hour hazardous waste and 8 hour supervisory training required by OSHA and U.S. EPA rules and regulations which complies with the accreditation criteria under the provisions of the proposed 29 CFR 1910.121 is required prior to beginning work. The Contractor shall furnish documentation at the Preconstruction Conference that demonstrates these requirements have been met.

The *HSMT* shall be equipped with the following:

(1) Communication equipment as required in subsection 250.03(d)2.A. and a vehicle.

(2) Monitoring and detection equipment for flammable gas, oxygen sufficiency, toxic gas, radiological screening and other hazards. This includes, as required, a combustible gas indicator, flame ionization or photo ionization detector, oxygen meter, radiation monitor with Geiger Mueller detector and other foreseeable equipment.

(3) Personal protective equipment (levels C and D) when required.

The *HSMT* shall be present on site and perform monitoring as required by 250.03(d) when work is being performed in areas of suspected contamination and on a predetermined basis throughout other work on the project.

The *HSMT* shall monitor for compliance with regulations, the project Health and Safety Plan and the Materials Management Plan (if they exist for the project), the Contract, and the environmental documents for the project. The *HSMT* shall immediately notify the Contractor, the Engineer of any hazardous condition.

During each week the *HSMT* is utilized, the *HSMT* shall prepare a daily monitoring diary which shall be submitted to the Contractor and the Engineer. This diary shall be submitted at the end of the week and shall become a part of the Department's records. The diary shall contain a chronological log of activities on the project including: dates and times on site, equipment used and calibrations, field monitoring results, visual observations, conversations, directives both given and received, and disposition of suspected hazardous substances.

Health and Safety Plan (HASP). The HSO shall prepare a written HASP for the project, formatted as shown in Appendix B, *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*, DHHS (NIOSH) Publication Number 85-115, available from the Superintendent of Documents, U.S. Government Printing Office. The Contractor and the HSO shall review the environmental documents listed prior to preparation of the HASP.

Four signed copies of the HASP shall be furnished to the Engineer for acceptance. The Engineer shall have seven calendar days to review and accept or reject the proposed HASP. Within five calendar days after acceptance, the HSO shall distribute signed and stamped (or sealed) copies of the accepted HASP to each emergency response agency servicing the project area, the HASP designated emergency hospital, and five copies to the Engineer. Earth or demolition work shall not occur until after the HASP is accepted and the HASP has been distributed. The HASP shall also be available to the Contractor's employees, their representatives, and officials of OSHA, EPA, Colorado Department of Public Health and Environment (CDPHE), local government health department, Federal Highway Administration, and other appropriate agencies and officials as may be designated by the Engineer. The Engineer will distribute the accepted HASP to appropriate Department personnel. The HASP shall be kept current and shall be revised by the HSO as warranted by changes in the field conditions.

All on-site workers (Contractor's, Department's, Utilities', and others) shall be briefed by the HSO on the contents of the HASP and any revisions thereof. The HSO shall conduct briefings (group or individual) to inform new employees, subcontractors, utility companies and other on-site workers of the HASP contents prior to their entry on site. All personnel involved in excavation or other soil disturbing activities shall receive the required two-hour Asbestos Awareness training by a Certified Asbestos Inspector, when asbestos discoveries are anticipated, or discoveries are made. A signature log of all briefing attendees shall be kept and furnished to the Engineer. The Contractor shall provide, as required, eye wash equipment and stations, emergency showers, hand and face washing facilities and first aid equipment.

The Contractor shall provide, as required, decontamination facilities for personnel and equipment employed in the work. The exact procedure for decontamination and frequency shall be included in the accepted HASP. Decontamination facilities shall meet the criteria set forth in the Code of Federal Regulations (29 CFR and 40 CFR).

(c) *Precautions and Procedures.* The following minimum precautions and procedures shall be followed during the construction of the project:

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SECTION 250
ENVIRONMENTAL, HEALTH AND SAFETY MANAGEMENT

1. General construction precautions:

   A. The Contractor shall properly handle all investigation derived waste generated by this project. Documentation shall be submitted to the Engineer of all tests performed for Treatment, Storage and Disposal (TSD) determination; classification of waste; hauling records; TSD acceptance; manifest (if required); etc. in accordance with applicable laws and regulations.

   B. When the work may involve air emissions, the Contractor shall contact the Colorado Department of Public Health and Environment (CDPHE), Air Pollution Control Division to ascertain if an air pollution emission notice (APEN) or permit is required for this operation. The Contractor shall be responsible for filing the APEN and obtaining said permit, if required. The processing of air pollution permits, if required, in non-attainment areas or where public hearings are required, likely will take more than 90 days.

2. For construction on a known or potentially contaminated site, the following conditions shall apply, in addition to those listed in subsection 250.03(d)1:

   A. The HSO shall be on site or readily available by radio, telephone or pager at all times during the work. When on site, the HSO shall have an operational portable or mobile cellular telephone available for immediate use in areas where such service is available. When on site in cellular telephone non-service areas, the HSO shall have available, for immediate use, radio access to a site with telephone service. The HSO shall be notified at least 24 hours prior to the start of confined space entry, storage tank removal, drilling, excavation, trenching, or dewatering operations.

   B. The HSO shall designate the onsite monitoring equipment for flammable gases, oxygen deficient or enriched atmosphere, and toxic gases, such as but not limited to, a flame ionization detector, photoionization detector, combustible gas indicator, and oxygen meter. This designated equipment shall be on site during all construction operations and be utilized during trenching, drilling, excavating, confined space entry, underground storage tank removal, and other appropriate construction operations. The exact equipment to fulfill this requirement shall be specified in the accepted HASP. The HSO shall conduct or supervise the monitoring. The monitoring equipment shall be calibrated as recommended by the manufacturer.

   C. When drilling, trenching, or excavating in the presence of detectable concentrations of explosive gases, the soil shall be wetted and the operating equipment shall be provided with spark proof exhausts.

   D. The Contractor, is responsible for ensuring that 29 CFR 1926 is fully complied with during the construction of the project.

   E. Affected excavation operations shall be discontinued and personnel shall be removed from the affected excavation sites where any of the following levels are detected:

      (1) 20.0 percent or more LEL flammable gas, or 10.0 percent in an underground or confined space,

      (2) Permissible Exposure Limit (PEL) of any toxic gas,

      (3) 19.5 percent or less oxygen,

      (4) 25.0 percent or more oxygen,

      (5) Greater than 2 mrem/hr. (Beta particle & photon radioactivity),

      (6) Greater than 15 pCi/L (Gross alpha particle activity), or

      (7) Other action levels as determined by the HSO.

(8) Uncovering of suspect Asbestos Containing Material (ACM), including but not limited to, buried facility components, active or abandoned utility lines, buried foundations and demolition debris, or miscellaneous ACM dispersed in the soil. The Contractor shall follow the procedures outlined in the HASP and 29 CFR 1926 to address these conditions. Work shall resume in these areas when approved by the Engineer.

F. Personnel shall be issued and utilize appropriate Health and Safety equipment as determined by the HSO, who shall provide the Engineer with a written explanation of what personal protective equipment (PPE) shall be worn, when, and by which personnel. Except in emergency cases, the Engineer shall be advised by the HSO of changes in the degree of PPE prior to implementation.

G. Personnel shall avoid the area immediately downwind of any excavation unless the excavation is monitored and declared safe.

H. The operators of excavating, trenching, or drilling equipment shall wear appropriate PPE as required in the HASP.

I. Exhaust blowers shall be present at the location where required in the accepted HASP.

J. The Contractor shall accomplish the work with employees who have been trained and equipped as required by the HASP and applicable provisions of 29 CFR 1910 and 29 CFR 1926.

K. Fire extinguishers, electrical equipment and wiring shall conform to the applicable requirements of 29 CFR 1926 and 49 CFR.

L. Smoking shall not be permitted within 50 feet of any excavation.

3. For construction within 1000 feet of a known or potentially contaminated site, the following conditions, in addition to those listed in subsection 250.03(d) 1. shall apply:

A. The areas under construction shall be checked with a combustible gas indicator before excavation begins to determine if flammable or combustible gas is in the area.

B. Excavations, trenches and drill holes shall be monitored by the HSO for flammable gas, toxic gas and oxygen deficiency or enrichment. This shall be carried out continuously unless the presence of flammable, combustible or toxic gas, or oxygen deficiency or enrichment in the area can be ruled out by the HSO. The recommendation to discontinue monitoring must be agreed to by the Engineer and the Contractor. Prior to implementation, this agreement shall be written, and shall contain specific conditions that will require re-evaluation of the area.

C. When flammable or toxic gas is found in the area, those precautions and procedures in subsection 250.03(d)2 shall apply.

4. The following procedures shall be followed if the level of contamination as documented in the environmental documents referenced in subsection 102.05 as revised for this project is exceeded, or if previously unidentified contaminated air, soil or water, is encountered during the construction of the project:

A. Work in the immediate area of the release or discovery of contamination shall cease. The Engineer shall be immediately notified.

B. If no HSO is required by the Contract, the Contractor shall designate an HSO as directed, in accordance with subsection 250.03(a).

C. The Engineer may direct the HSO to evaluate the material for potential hazardous substance or other contamination or unsafe conditions. This evaluation may include, but is not limited to, on site field monitoring, on site testing, and on or off site laboratory analysis. Removal of storage tanks and surrounding contaminated soils shall be in accordance with applicable laws, regulations and established procedures. If the contaminated material cannot be placed in the embankment or remediated on site, it must be removed to an appropriate TSD facility, as designated in writing by the Engineer. The HSO shall supervise the necessary testing required to make appropriate TSD determinations. Disposal of the unsuitable material shall be considered as remediation work as described in subsection 250.03(d)4.D and 250.03(d)4.E.

D. If this site is determined to be contaminated with petroleum products, hazardous substances or other solid waste in excess of that indicated in the above listed site investigation documents, a thorough Site Investigation and Waste Management Plan shall be accomplished under the supervision of the HSO The Site Investigation and Waste Management Plan shall be submitted to the Engineer for approval and shall determine the extent of contamination and propose at least three types of remedial action for the contaminated area as required by applicable statutes and regulations. The HSO shall be available to assist the Engineer in explaining this study to the regulatory agencies. When requested by the Engineer, the Contractor shall prepare a Remediation Plan based on the selected remedial method, and shall submit this to the Engineer for approval. The time required for the Engineer's review of the Remediation Plan, including all necessary drawings, calculations, specifications, and other documentation will not exceed four weeks after a complete submittal is received. This work shall not be done unless authorized in writing by the Engineer.

E. If the site is determined to be contaminated with petroleum products; hazardous chemicals, materials, or wastes; or other solid wastes, and is required to be remediated, the HSO or other qualified individuals will supervise the Remediation Plan implementation as concurred to by the regulatory agencies, as directed. Hazardous Waste generated by remedial activities shall list the Colorado Department of Transportation as the hazardous waste generator on the required paperwork for projects on State Highways and their associated frontage roads. If this project is not on a State Highway or frontage road, then the appropriate local governmental entity having jurisdiction over the transportation system facility shall be listed as the hazardous waste generator. If the waste disturbed or produced was caused by Contractor negligence, the Contractor shall be listed as the hazardous waste generator. Remediation work shall be done only when authorized by the Engineer in writing.

250.04 Heavy Metal Based Paint Management. When the work includes the removal of paint or items covered with paint which may contain lead, chromium or other heavy metals, the requirements of this subsection shall apply in addition to the requirements of subsection 250.03.

The requirements of the HASP shall be in accordance with OSHA Publication Number 3142, *Working with Lead in the Construction Industry.*

Paint Removal and Waste Disposal work shall be performed in accordance with 29 CFR 1926.62, State and local air quality regulations, the Steel Structures Painting Council (SSPC) Guide for Containing Debris Generated During Paint Removal Operations, the *Industrial Lead Paint Removal Handbook* (SSPC 91-18), and the references contained therein.

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SECTION 250
ENVIRONMENTAL, HEALTH AND SAFETY MANAGEMENT

The following minimum precautions and procedures shall be followed unless modified in the approved HASP or its updates:

(a) The Contractor shall contact the CDPHE, Air Pollution Control Division to ascertain if an air pollution permit is required for the cleaning or demolition work. If an air pollution permit is required, the Contractor shall obtain the permit. The Contractor shall furnish the Engineer with a copy of the permit application and the permit issued prior to starting cleaning or demolition activities. A copy of the Air Pollution Emission Notice [APEN] shall be provided to the Engineer, if such notice is required under the Colorado Air Quality Control Commission's regulations. The processing of air pollution permits in non-attainment areas, or where public hearings are required, likely will take more than 90 days.

(b) The Contractor shall contain paint chips, corrosion residues, and spent abrasives, herein referred to as waste materials, resulting from the cleaning or demolition operations. The Contractor shall not deposit or release waste material into the water, air or onto the ground below or adjacent to the structure. The Contractor shall conduct cleaning operations to minimize the waste materials produced. Prior to beginning the work, the Contractor shall submit to the Engineer for acceptance, a detailed methods statement for capturing, testing, and disposing of the removed materials. The Engineer will have seven calendar days to review, and accept or reject this methods statement.

(c) Abrasives utilized for blast cleaning shall be low-dusting and low waste. Unless approved otherwise, vacuum blasting or wheel blasting shall be used.

(d) The HSO shall sample and test the waste material for lead, chromium, and other paint associated heavy metals using the Toxicity Characteristic Leaching Procedure (TCLP) Test, Method 1311 of the EPA publication, Test Methods for Evaluating Solid Waste 846. Sample collection methodology and frequency shall be recommended by the HSO and accepted by the Engineer with an adequate number of samples taken to be representative of all waste material collected. If the waste material does not pass the TCLP test, it shall be disposed of in a permitted TSD facility as designated in writing by the Engineer. The waste materials handling decision shall be documented by a report (five copies) submitted to the Engineer. This documentation shall include a description of sample collection methodology, testing performed, test results and comparison of test results with hazardous waste requirements. The waste material shall not be held at an unpermitted TSD facility site in excess of Resource Conservation and Recovery Act (RCRA) temporary storage time limits.

(e) All painted steel components which are not designated to be salvaged shall be recycled. Contractor possession of the steel for future use shall be considered a form of recycling. Prior to transport of the components off-site, the Contractor shall obtain a letter from the recipients of the painted steel components stating that they have been fully informed of the contents of the paint and are capable of handling the paint. If the Contractor is to maintain future possession of the steel, the Contractor shall supply this letter. If there will be more than one recipient of the painted material, one letter shall be obtained from each recipient. The Contractor shall provide a copy of each letter to the Engineer. If the painted steel components will be recycled by melting, the letter from the recipient is not required. The Contractor shall submit a letter stating the destination of the painted steel components and that they will be melted.

(f) When the work consists of the removal of a bridge or components of a bridge coated with paint which has been assumed to contain lead, chromium, other heavy metals, or a combination thereof the Contractor shall capture paint debris which is dislodged during removal operations. The Contractor may choose any method for dismantling the bridge, subject to the following required construction sequence limitations:

(1) The concrete deck shall be removed prior to removal of the steel superstructure.

(2) If the methods statement indicates that girders will be dropped to the ground during dismantling, all debris from the concrete deck removal operation shall be removed from the area below the bridge before any girders are dropped into this area.

(3) Girders may be cut and dropped only if the span is located entirely over land.

250.04 Material Handling. This work consists of the additional handling of groundwater and soils to be excavated for construction of the project which are suspected or known to be contaminated. This work also includes stockpiling or containerization, analytical sampling and testing, and final disposition of contaminated groundwater and soils requiring special handling.

The Contractor shall maintain vertical trench walls for the work in the specified areas of known or potential contamination, as shown on the plans. Shoring may be necessary to meet this requirement. The Contractor shall confine the removal of contaminated groundwater and soils encountered as a result of the excavation activities in the specified areas to the vertical and horizontal limits of structure excavation specified in the Contract. The Contractor shall be responsible for any contaminated materials generated beyond the limits of excavation. This shall include any sampling, analysis, and disposal required, and the costs thereof. The Contractor shall be listed as the generator of any such material. The limits of excavation shall be determined as 18 inches outside of structures, including sewers, water lines, inlets, manholes, and other underground structures to be constructed, or as directed.

Specific areas of known or potential contamination have been identified in the project plans. There is the potential of encountering contaminated groundwater and soil, which has not been summarized in the plans or specifications, at unknown locations on the site. Suspected contaminated soil and groundwater shall be handled by one of three methods as follows:

(a) *Materials Handling (Stockpile& Containerization).* When recommended by the HSO and authorized by the Engineer, material shall be stockpiled or containerized for analysis and characterization for proper handling and, disposal, or both. Sampling and testing of materials shall be as described in the Contract. If analysis indicates that soil samples are designated as uncontaminated, as determined by the criteria shown in the Contract or as determined by the CDPHE, the associated soils will not require any special handling and will become the property of the Contractor and may be used on site, subject to other requirements of the Contract. Health and safety monitoring and strict fugitive dust control shall be conducted during the placement of these soils. If analysis indicates that groundwater samples are designated as uncontaminated, as determined by the criteria shown in the Contract or as determined by the CDPHE, the groundwater shall be handled in accordance with subsection 107.25.

Stockpiled and containerized materials shall be secured in compliance with the following provisions until they are determined to be uncontaminated:

1. The Contractor shall not store the material for more than 90 days.
2. The Contractor shall prevent any runoff from infiltrating the ground or running out of the containment area.
3. Soils and groundwater containing different contaminants shall be placed in separate containers or stockpiles.

4. The Contractor shall prevent the dispersion of materials or the dilution or mixing of containers and stockpiles.
5. The ground surface on which the contaminated soils will be placed shall be covered with plastic sheeting which will withstand the placement and removal of stockpiled materials without breaching.
6. The ground surface shall be graded to drain toward the edge of the soil piles and the berm or trench around them shall be covered by plastic sheeting.
7. Proper security shall be provided in accordance with 40 CFR.

(b) *Solid Waste Disposal.* Soils determined to be contaminated, but not hazardous, as established by criteria in the Contract or as determined by CDPHE or other regulatory agencies having jurisdiction, shall be handled and disposed of, or both as recommended by the HSO and approved by the Engineer. The Contractor shall haul this material to a solid waste disposal facility.

(c) *Contaminated Groundwater Disposal*. Groundwater determined to be contaminated, but not hazardous, as established by criteria in the Contract or as determined by CDPHE or other regulatory agencies having jurisdiction, shall be handled and disposed of, or both as recommended by the HSO and approved by the Engineer. *The* Contractor shall prepare a dewatering plan proposing at least three types of treatment and/or disposal options of contaminated groundwater as required by applicable statutes and regulations. One of the treatment options shall include permitting and onsite treatment prior to discharge or disposal. The dewatering plan shall be submitted to the Engineer for approval four weeks before dewatering activities begin.

(d) *Hazardous Waste Disposal.* Soils and groundwater that are designated or suspected to be hazardous shall be containerized *immediately* upon excavation or upon discovery. Hazardous material shall be labeled and transported to a permitted treatment, storage and disposal (TSD) facility or to a hazardous waste disposal facility approved by the Engineer.

(e) *Additional Requirements.* Stockpiled or containerized material characterized as uncontaminated, contaminated or hazardous shall be stored and disposed of in a manner consistent with current established federal, state, and local regulations for waste materials.

Materials with contaminants not specifically regulated shall be disposed of by the Contractor as directed, in consultation with CDPHE. All areas where wastes are generated shall be reviewed by the HSO to identify potential contaminant sources that may result in a contaminated waste stream.

Contaminated groundwater and soils, which have been identified as solid waste or hazardous waste, requiring disposal according to federal, state, and local regulations, shall be transported in accordance with 49 CFR by the Contractor to an appropriately permitted treatment facility, landfill, incinerator or asphalt plant or other facility approved to accept the waste. CDPHE and the landfill or other treatment or disposal facility shall be notified by the HSO of the material to be disposed of and the corresponding analytical test results prior to shipment. Potentially contaminated water collected from the lined trench of a stockpile shall be treated as required by Colorado Wastewater Discharge Permit System (CDPS) permits, 29 CFR and 40 CFR and reimbursed separately in accordance with Contract requirements.

250.05 Sample delivery. This work consists of the collection, containerization and delivery of material samples for analysis to the testing facility designated in the Contract.

Environmental Protection Agency (EPA) protocol and standards shall be followed in the collection, containerization and transport of samples to be analyzed, including the documentation of the proper chain of custody of all samples. The Contractor shall collect sufficient sample material to perform the required analysis and is responsible for ensuring that appropriate climate control has been provided for sample transport. Sample delivery shall be made within the maximum allowable holding time for each sample type, not to exceed 24 hours, excluding weekends. The time period required for sample collection and delivery to the testing facility will not be considered an excusable delay. The analysis to be completed and turnaround time shall be approved by the Engineer.

The Contractor shall provide the Engineer with a copy of documentation indicating that proper chain of custody requirements have been followed for all samples.

Quality control samples shall be provided by the Contractor in accordance with the quality control requirements of the testing facility designated in the Contract (quality control requirements are available from the Engineer). The Contractor shall prepare, label and transport these samples to the testing facility in conjunction with the delivery of other samples authorized for analysis by the Engineer, at no additional cost.

The Engineer may request splits of samples, in advance of collection, which shall be provided at no additional cost by the Contractor.

250.06 Asbestos-Containing Material Management. Environmental documents or plans listed in the special provisions should include known or suspected locations that could involve encounters with ACM during excavation and other soil disturbing construction activities. Unexpected discoveries of ACM may be made during excavation and soil disturbing construction activities. Asbestos contaminated soil, shall be properly managed or remediated, in accordance with subsection 250.07(a).

All asbestos related activities shall be performed by Colorado certified asbestos professionals, contractors, or consultants. Certifications are issued by the Colorado Department of Public Health and Environment (CDPHE), Indoor Air Quality Unit. A Colorado Certified Asbestos professional shall manage the management and disposal of asbestos contaminated soil and other ACM. The Indoor Air Quality Unit within CDPHE is the only unit that certifies such professionals. The Contactor shall furnish a copy of the license to the Engineer.

(a) *Regulatory Compliance.* Asbestos contaminated soil management is governed by 6 CCR 1007-2, Section 5, which includes and references regulatory compliance with Asbestos Hazard Emergency Response Act (AHERA) Colorado *Regulation* 8; Inspection and reporting protocol and demolition standards are governed by AHERA; Demolition and notification standards are governed by National Emission Standards for Hazardous Air Pollutants (NESHAPS); Colorado Regulation 8 governs all asbestos activities, demolition, permitting, and certification of Certified Asbestos Professionals in the State of Colorado. Colorado Regulation 8 is more stringent than AHERA and NESHAPS and supersedes federal regulations. Conflicting regulatory requirements between AHERA and NESHAPS, if not specifically addressed in Colorado Regulation 8, shall be addressed and approved protocol negotiated with CDPHE. The Contractor shall conform to all current regulations, policy directives, or both, issued by the EPA, CDPHE, and the Department.

(b) *Asbestos Management and Visual Inspections* Asbestos management must be performed by a certified asbestos professional. Final Inspections of the area of asbestos contaminated soil removal shall be performed by an Asbestos Consultant to determine what, if any, controls must be instituted to allow future activity in the excavation area. All final visual inspections shall be conducted only when soil is dry.

(c) *Permitting and Notification.* The CDPHE requires notification of any soil disturbing activity where asbestos is known, suspected, or discovered. A 24-hour notification to CDPHE is required prior to any soil disturbing activity of an unplanned asbestos discovery. A 10 working day notification to CDPHE is required prior to any soil disturbing activity in an area with known or potential material suspected of containing asbestos in or on the soil or asbestos-contaminated soil. Removal of asbestos-containing material on a facility component, that is located on or in soil that will be disturbed, with asbestos quantities above the following trigger levels must be permitted and abated in accordance with the requirements of Air Quality Control Commission Regulation No. 8 (5 CCR 1001-10, Part B):

(1) 260 linear feet on pipes,

(2) 160 square feet on other surfaces, or

(3) The volume of a 55-gallon drum.

All permit applications shall be submitted to the Colorado Department of Public Health and Environment a minimum of 10 days prior to start of work for approval. The permit application and notification shall be submitted simultaneously. The Contractor shall obtain all required State and local permits and shall be responsible for all associated fees. Permit application, notification, and waiver request forms shall be submitted to:

Colorado Department of Public Health and Environment Permit Coordinator/APCD - SS - B1 4300 Cherry Creek Drive South Denver, CO 80246-1530 Phone: (303) 692-3100 Fax: (303) 782-0278

Application and waiver forms are available on the CDPHE website: asbestos@state.co.us

(d) *CDOT's Asbestos-Contaminated Soil Management Standard Operating Procedure, dated August 22, 2011.* Asbestos contaminated soil shall be managed in accordance with 6 CCR 1007-2, Section 5, Asbestos Waste Management Regulations. Regulations apply only upon discovery of asbestos materials during excavation and soil disturbing activities on construction projects, or when asbestos encounters are expected during construction. The contractor shall comply with procedures detailed in the CDPHE's Asbestos-Contaminated Soil Guidance Document and CDOT's approved *Asbestos-Contaminated Soil Management Standard Operating Procedure, dated August 22, 2011*, including the following minimum requirements:

(1) Immediate actions and implementation of interim controls to prevent visible emissions, exposure, and asbestos contamination in surrounding areas.

(2) Soil Characterization.

(3) Training required for all personnel involved in excavation and other soil disturbing activities, once asbestos is encountered during construction or on projects where asbestos encounters are expected. Asbestos Awareness Training shall be given by a qualified and certified Asbestos Building Inspector with a minimum of six months experience inspecting asbestos contaminated soil.

(4) Assessment for the presence and extent, within the proposed area of disturbance, of asbestos discoveries, whether expected or unexpected, by a Certified Asbestos Inspector.

(5) Investigation and sampling required for risk assessment and management. Investigation, if required, shall be conducted by a Certified Asbestos Inspector.

(6) Risk assessment and determinations for further management or abatement.

(i) Risk assessment and determinations must be made by a Certified Asbestos Inspector, and coordinated with the Engineer.

(ii) Soil remediation is not necessarily required, depending on the circumstances.

(7) Submit 24-hour Notification of Unplanned Asbestos Discovery.

(8) Submit 10-day Notification of Planned Asbestos Management.

(9) Submit 24-hour Notification of Unplanned Asbestos Discovery.

(10) Submit 10-day Notification of Planned Asbestos Management.

(e) *Risk Assessment and Determinations for Further Management Or Remediation.* Risk assessment and determinations for further management or remediation must be closely coordinated with the Project Engineer and Project Manager of the Statewide Management Plan.

Methamphetamine Lab Sites. Demolition of former Methamphetamine (meth) labs is enforced by the Governing Authority, which varies from county to county. The Contractor shall demolish all buildings that are identified as former meth labs, as listed in public listings by the Governing Authority. The Contractor shall provide evidence of demolition to the Governing Authority, obtain receipt of such evidence by the Governing Authority, and shall submit these to Engineer immediately following demolition.
Septic tank removal at known meth lab sites shall undergo preliminary assessment by an Industrial Hygienist or Certified Industrial Hygienist to determine proper removal and disposal. Work shall proceed in accordance with the recommendations of the Hygienist.

250.07 Environmental Health and Safety Management will not be measured, but will be included in the cost of the related item that creates the need for it. This will include all work, materials, and hourly time charges by the HSO and other personnel required to accomplish the following:

(1) Preparation, submittal and briefing of the initial HASP

(2) Preparation and submittal of the Waste Management Plan

1. Preparation and Submittal of the Dewatering Plan
2. Preparation and Submittal of the Remediation Plan
3. Procedures and equipment specified in subsections 250.03 - 250.07
4. PPE (levels C and D) for Contractor’s personnel for any contamination identified in the preconstruction investigations

(3) Preparation and submittal of the final site report

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SECTION 250
ENVIRONMENTAL, HEALTH AND SAFETY MANAGEMENT

METHOD OF MEASUREMENT

The quantity to be measured for Health and Safety Monitoring e will be included in the work.

(1) Field monitoring necessary to ensure the safety of workers on the site;

Equipment specified in subsection 250.03(a), preparation and submittal of the daily diary, travel to and from the project site, and PPE (Levels C and D) required for use by the Monitoring Technician will not be measured and paid for separately, but shall be included in the lump sum cost.

Equipment specified in subsection 250.03(b), supervision of the MT, preparation and submittal of the daily monitoring diary, travel to and from the project site, and PPE required for use by the MT (Levels C & D) will not be measured and paid for separately, but shall be included in lump sum cost.

Solid stockpiled materials will be paid for in accordance with subsection 109.04 and standard force account procedures.

Additional environmental health and safety management work required and authorized by the Engineer, but not included in the items listed above, will be considered extra work to be paid for in accordance with subsection 109.04, unless such work is caused by the Contractor's action.

250.10 Environmental Health and Safety Management will not be measured for payment.

Monitoring Technician will not be measured for payment but shall be included in the cost of work items.

Environmental Health and Safety Management, Health and Safety Monitoring Technician bid items shall include vehicles, phone charges, supplies, printing, postage, office support, and all other miscellaneous costs associated with the work.

Payment for Groundwater Handling (Containerization & Analysis) will be paid for in accordance the direction of the engineer in accordance 109.04 and standard force account procedures.

Payment for Solid Waste Disposal and Solid Hazardous Waste will be paid for in accordance the direction of the engineer in accordance with subsection 109.04 and standard force account procedures.

Solid Hazardous Waste. Transport, Disposal and /or Treatment costs will be paid for by planned force account in accordance with subsection 109.04 and standard force account procedures.*Liquid Hazardous Waste.* Transport, Disposal and /or Treatment costs will paid for by planned force account in accordance with subsection 109.04 and standard force account procedures.

BASIS OF PAYMENT

The cost of shoring required to limit the removal of contaminated materials will be paid for in accordance with subsection 109.04 and standard force account procedures.

Payment for Materials Sampling and Delivery will be paid for in accordance the direction of the engineer in accordance with subsection 109.04 and standard force account procedures.

The Contractor shall be responsible for damage caused by Contractor negligence to the environment, persons, or property. Expenditures associated with actions of the Contractor shall be borne by the Contractor at no cost to the project.

Contaminated groundwater containerized and disposed under the requirements of this specification will be paid for by planned force account in accordance with subsection 109.04 and standard force account procedures.

Pay Item	**Pay Unit**
Environmental Health and Safety Management	Force Account

REVISION OF SECTIONS 304
AGGREGATE BASE COURSE

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

Subsection 304.08 shall include the following:

Pay Item	**Pay Unit**
Aggregate Base Course	Cubic Yard

REVISION OF SECTION 403
HOT MIX ASPHALT

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

MATERIALS

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		
		S (75)	Patching	
Air Voids, percent at: N (design)	CPL 5115	3.5 – 4.5	3.5 – 4.5	
Lab Compaction (Revolutions): N (design)	CPL 5115	7 75	7 75	
Stability, minimum	CPL 5106	28	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	70	70	
Accelerated Moisture Susceptibility Tensile Strength Ratio (Lottman), minimum	CPL 5109 Method B	80	80	
Minimum Dry Split Tensile Strength, kPa (psi)	CPL 5109 Method B	205 (30)	205 (30)	
Grade of Asphalt Cement, Top Layer				
Grade of Asphalt Cement, Layers below Top		PG 58-28	PG 58-28	
Voids in the Mineral Aggregate (VMA) % minimum	CP 48	See Table 403-2	See Table 403-2	
Voids Filled with Asphalt (VFA), %	AI MS-2	65-80	65-80	
Dust to Asphalt Ratio Fine Gradation Coarse Gradation	CP 50	0.6 – 1.2 0.8 – 1.6	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.

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REVISION OF SECTION 403
HOT MIX ASPHALT

All mix designs shall be run with a gyratory compaction angle of 1.25 degrees and properties must satisfy Table 403-1. 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. The City 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. The City 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.

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

Hot mix asphalt may contain up to 20% reclaimed asphalt pavement.

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

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

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REVISION OF SECTION 403
HOT MIX ASPHALT

CONSTRUCTION REQUIREMENTS

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 first season (winter shut-down), shall be completed to the full thickness required by the plans. In the second season, the Contractor shall defer the final lift on all zones to the end of the project so the final lift is placed on the entire project (excluding the placed in Season 1) at once. The Contractor shall make provisions for temporary drainage (ensure water drains and ponding is eliminated or minimized) until the top mat is placed. The Contractor's Progress Schedule shall show the methods to be used to comply with these requirements.

BASIS OF PAYMENT

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 S) (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 for this contract the asphalt cement will not be measured and paid for separately but shall be included in the cost of Hot Mix Asphalt (Grading S)(75)(PG 58-28). 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 412
PORTLAND CEMENT CONCRETE PAVEMENT

DESCRIPTION

Section 412.01 will include the following:

This work will consist of placing 6" concrete pavement for driveways and curb cuts at locations show in the plans.

REVISION OF SECTION 514
PEDESTRIAN RAILING

Section 213 of the Standard Specifications is hereby revised for this project as follows:

Subsection 514.01 shall include the following:

The Contractor shall submit to the Engineer for approval prior to beginning construction, pedestrian railing shop drawings demonstrating construction details have been properly coordinated between all elements of construction.

Delete subsection 514.02 and replace with the following:

514.02 Pedestrian Railing. Pedestrian railing as noted on the road way, landscape plans; shall be Master Halco model: IMPERIAL FENCE – STYLE D MOD, or approved equal.

(a) Nominal height for fence panel shall be 4'-0".

(b) Picket size shall be 1" and 16 gauge.

(c) Post size shall be 3" x 12 GA.

(d) Post cap shall be ball type.

(e) Mounting bracket shall be enclosed swivel (BB309L/E) type.

(f) Fence coating shall meet manufacturer recommended corrosion resistance and shall be black in color.
1. Powder coating is acceptable.

(g) Surface mounted posts shall be: steel plated post with 5003G base plate, powder coated: black. Base plate shall be welded to the post prior to applying powder coat finish.
1. The base plate is described as follows: 6" x 6" x ¼". Four (4) pre-drilled anchor holes shall be set ¾" in from edges of all sides and have an OD of 9/16". There shall be a fifth pre-drilled anchor hole located in the center of the base plate with an OD of 9/16".
2. Anchor bolts shall be 1/2" diameter and shall have a design pull-out strength in tension after installation in the sidewalk of 6 kips.

(h) Rub Rails (Handrails) shall consist of 2 inch OD, steel tube with welded end caps. Powder coat black; and shall be anchored to posts in accordance with Section 505 of the current ADA handrail requirement regulations.

The Contractor shall supply a 4-foot long sample with end posts on each end for Pedestrian Rail (Steel) for approval by the Engineer and the City of Idaho Springs prior to the submittal of working drawings. The samples shall be representative of the finished construction product.

Subsection 514.06 shall include the following:

Install fence in accordance with manufacturer's instructions.

Space posts uniformly at 8' OC maximum unless otherwise indicated.

Concrete Set Posts:

Pedestrian railing shall be surface mounted to the concrete sidewalk surface: locations are noted on the Sidewalk Details Plans. Contractor shall provide shop drawings for proposed anchor bolt system for approval by Engineer.

Check each post for vertical and top alignment, and maintain in position during placement and finishing operations.

Rub Rails (Handrails) to be installed where indicated on the Plans. Rub Rails shall be mounted 42" above the finished sidewalk surface, anchored to all posts for entire length of required segment, as indicated on the Plans. Anchor shall be in compliance with Section 505 of the current ADA handrail requirement regulations. Anchor may be an L- Bracket in shape and shall be powder coated black. Contractor shall submit shop drawings for approval by the engineer recommended anchor installation for approval by Engineer.

METHOD OF MEASUREMENT

Subsection 514.07 shall include the following:

All hardware and work required to install the pedestrian railing will not be measured and paid for separately but shall be included in the cost of Pedestrian Railing Steel.

Sample Pedestrian Railing will not be measured separately, but shall be included in the work.

In subsection 514.08, revise the 3rd paragraph as follows:

Pay Item	**Pay Unit**
Pedestrian Railing	Linear Foot

Pay item for pedestrian railing shall include all tools and labor necessary to install fence panels, posts, post footings, mounting plates, post caps, rub rails, and mounting systems according to the Plans and manufacturer's recommendations.

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SECTION 519
HOT DIP GALVANIZING AND POWDER COATING

Section 519 is hereby added to the Standard Special Specifications for this project as follows:

DESCRIPTION

519.01 This work consists of preparing, galvanizing, and powder coating steel products in accordance with these specifications.

MATERIALS

519.02 Materials for hot dip galvanizing shall be as follows:

(a) *Coatings*. All coatings shall be able to withstand prolonged temperatures up to 180 degrees F without sag, blister, or peel damage during the warranty period. Topcoat formulation shall provide weathering, chemical, and ultraviolet (UV) resistance. 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 in. lbs. All topcoats- Minimum 90 in. lbs.

3. *Adhesion Testing*: ASTM D-4541, 30 day test. Minimum 500 PSI for either: Method B-flat surface; Method E-curved surface.

4. *Abrasion Resistance*: ASTM D-4060, 30 day test. Maximum 90 mg loss for 1000 cycles with CS 10 or CS 17 wheel.

5. *Flexibility*. ASTM D-522, 30 day test- Method B. Epoxies shall pass a 180 degree bend over a 3/4-inch mandrel. All Topcoats shall pass a 180 degree bend o0ver a 3/8-inch mandrel.

6. Coating color shall be Federal Standard 595, color number 37038.

CONSTRUCTION REQUIREMENTS

519.03 Materials to be hot dip galvanized shall be constructed as follows:

(a) *Coating First-Use Galvanized Steel Products – Plant and Shop*. The Contractor shall furnish a warranty performance bond equal to 100 percent of the contract price for coated galvanized products; this bond shall be maintained until release of responsibility is issued by the Engineer in writing. The Contractor's public and property damage liability insurance shall also remain in effect during the entire warranty period. Conditions for release of warranty responsibility are addressed in Subsection (g).

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 prior to galvanizing. Bevel size to be used is based on steel thickness and other criteria as follows:

1. Less than ½ in. thick - 1/32 in. to 1/16 in.

2. Over ½ in. thick – 1/16 in. to 1/8 in.

3. Bores, notches & grooves – root face of 1/32 in. to 1/16 in.

4. Welds – clean and work finish according to AWS standards.

All fabricators and users of potentially hazardous materials or operations shall determine and comply with Colorado Department of Public Health and Environment regulations.

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. In cases of differing readings affected parties shall agree to use the gauge displaying the greater degree of accuracy.

(b) *Galvanizing.* Galvanizing shall be done according to the Standard ASTM Specification stated in the Contract except that items shall not be quenched with water, oil or liquid. Ambient air quenching is acceptable. Chromate treatment of any type is not acceptable. Zinc-Phosphate Pretreatment or Acrylic Passivation Pretreatments as described in Subsection (d-1) and (d-2) are acceptable.

The Galvanizer shall measure and record thickness of galvanized coating. Measure frequency shall comply with the applicable ASTM specification. Records shall be provided to the Engineer and to the point of next fabrication.

Spot areas not requiring galvanizing shall be marked and cleanly patched with material that prevents galvanization but does not weaken the adjacent spelter. Repair of patch areas shall comply with Practice Method 1) or 2) of Subsection (c).

Prior to further work, the Galvanizer shall notify the Engineer in writing that the galvanized order is chromate free, air quenched, date(s) of galvanizing, and date(s) of any Zinc-Phosphate or Acrylic Passivation Pretreatments.

Products not certified chromate free by the Galvanizer shall be tested prior to further work. 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 before work resumes.

(c) *Repair of galvanized products.* Uncoated areas or damaged coating exceeding applicable specification limits shall be re-galvanized per original specification. Cuts made after galvanizing shall be ground, beveled, and smoothed before repair. Repair of all cuts, uncoated areas or minor damage shall comply with Practice Method 1 or 2 as described below:

1. Metallizing. Conforming to ASTM A-780, 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 reasonably match adjacent galvanizing, as measured by calibrated DFT gauge.

2. Paint. Conforming to ASTM A-780, Annex A2, except that an organic zinc-rich epoxy paint containing minimum 80 percent zinc concentration shall be used. The epoxy paint shall conform to all other requirements in Subsection (e), as defined for epoxy. Thinning shall comply with manufacturer's instructions to prevent adjacent spelter damage. A repair coat of 3 to 5 mils shall be applied by brush or dauber only.

3. Coat imperfections such as burring, run/drip, high spots, heavy dross, or ash inclusion shall be removed and cleaned. Areas of re-work falling below zinc thickness limits shall be repaired according to Practice Method 1 or 2 of this Subsection.

4. Printed technical data sheets (PTDS) shall be provided to the Engineer for repair materials used. Spray can paint or cold galvanizing compound repair will be rejected; these substances are not compatible with the coating systems to be employed.

(d) *Preparing galvanized surfaces for coating.* Products shall be inspected for shipping and handling damage before surface prep work begins. Damage shall be reported to the Galvanizer and to the Engineer prior to repair. The Engineer will order repair or replacement of damaged items. Minor repair of galvanizing shall comply with Practice Method 1 or 2 of Subsection (c).

The Contractor shall prepare all coatable surfaces to provide a slightly roughened profile without removing over 1.0 mils of the galvanized coating. Minimum ASTM zinc thickness specifications shall still apply after preparation.

Fasteners to be coated shall be lightly brushed or sanded on the surfaces to be coated. Care shall be taken so that a minimal amount of zinc is removed.

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 1-2 percent ammonia solution and thoroughly rinsed. Wash and rinse pressure shall not exceed 100 PSI or 185 F temperature.

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

1. Zinc-Phosphate Pretreatment. Treatment can only be used on new galvanizing less than 48 hours of age. Thickness measure after treatment is not required when using this method.

   Items shall be immersed in a bath of acidic zinc-phosphate solution for 3 to 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 Pretreatments. Treatment can only be used on fresh hot galvanizing or new galvanizing less than 48 hours of age. Thickness measure after treatment is not required for either application method. Only chrome-free solutions shall be used, applied by a method that ensures complete coverage of all coatable surfaces. The treater shall provide the Engineer with treatment dates for each item and PTDS for solution(s) used. The Galvanizer may apply solution to fresh hot galvanizing that is less than 6 hours of age, still clean, dry, and 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. Solution shall then be applied and cured according to supplier's instructions.

Fully cured, treated items shall be rewashed, rinsed and dried again just before coating. Articles not coated within 100 days of treatment shall be abrasive blasted per 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 5 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 measure 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:

   A. Small areas falling below required zinc thickness shall be repaired according to Subsection (c) Practice Method 1 or 2. No single area shall exceed 2 in. at its largest width or 12 in. at its longest dimension.

      Total repair area shall not exceed 1 percent of the coatable surface per item; if limits are exceeded or zinc thickness is below specification the item shall be re-galvanized per original specification.

   B. 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 so the City can later inspect these areas.

   C. 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 or other harmful contamination.

(e) Coating and Paint Systems.

Prepared items shall be coated with a 2 or 3 coat system described in this Subsection. Alternative coating systems shall be pre-approved in writing by the Engineer. Manufacturers 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 noted 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 closely match. Finished color shall not vary more than 4 delta units from plan specification.

Volatile Organic Compound (VOC) levels shall not exceed 3.0 lbs. per gallon for each applied coat. Dry films shall contain less than 1 percent lead and other toxic heavy metals. Zinc concentration of epoxy coats shall not exceed 40 percent. Topcoats shall be of semi-gloss material with a rating of 50-75.

Coats 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 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 Coater shall oven preheat the articles to abate out-gassing potential. The Coater shall be responsible for utilizing compatible materials and coating processes to obtain proper coat to coat adhesion.

   Epoxy Powder base coat(s) shall measure 2 to 6 mils DFT and be applied by electrostatic or Tirbo/Airstatic spray. Powder formulation shall be a non-hybrid epoxy of anti-gassing grade.

   The powder topcoat shall be electrostatic or Tirbo/Airstatic spray applied and measure 3 to 6 mils DFT. Powder formulation shall be non-acrylic, high-build, aliphatic-based, Enhanced Polyester or Urethane Polyester of anti-gassing grade.

(f) *Repair of Coated Products.* The Contractor shall be responsible for repairing damage from shipment, installation, field welding, or other repairs necessary during the warranty period. Damage shall be reported to the Engineer prior to repair. Repairs shall be done to the satisfaction of the Engineer.

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

Any damaged area to the base coat material over one square inch. Total repair areas exceeding 5 percent of the coating per item. 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 existing topcoat material and closely match existing color. Paint requirements listed in Subsection (e) shall apply to the material. The paint supplier shall provide the Engineer with PTDS for the product(s) used.

Single area repair smaller than eight square inches 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 will be rejected.

(g) *Acceptance conditions for release of warranty responsibility.* Coated products shall be free from the following defects for two full years from the initial date of written project acceptance. Defect areas that received repair during the warranty period shall also be free from the described defects:

No peeling shall exist on any portion of the coatings. No blistering shall exist on any portion of the coatings. Color fading shall not fall below a 35 gloss rating. Mottling defects shall not exceed 3 percent of the topcoat surface. No cracking of the topcoat material shall be visible. No rusting discoloration shall be visible on the coating. No sag or other coating adhesion loss shall be evident.

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SECTION 519
HOT DIP GALVANIZING AND POWDER COATING

METHOD OF MEASUREMENT

519A.04 Hot dip galvanizing and powder coating will not be measured for payment.

BASIS OF PAYMENT

519A.05 Hot dip galvanizing and powder coating will not be paid for separately, but shall be considered subsidiary to the item to be hot dipped galvanized and powder coated.

Add the following Section:

SECTION 579
CONCRETE OVERLAY (THIN BONDED EPOXY OVERLAY)

Description

579.01 This work consists of furnishing and placing an overlay system comprised of a two-component epoxy resin system with broadcast aggregate on a concrete bridge deck for the purpose of improving skid resistance and sealing the concrete surface. Prepare the surface of the concrete and make two applications of the epoxy-aggregate system in accordance with these specifications. Install a wearing course that is provided through a single manufacturer.

Material

579.02 Conform to the following:

(a) Epoxy resin system. Provide a two-component, 100% solids, low-modulus, flexible, high-elongation, moisture-insensitive epoxy resin system in accordance with the requirements of Table 579-1.

Table 579-1
Epoxy Resin Physical Requirements

Property	Test Method	Minimum	Maximum	Remarks
Pot Life	AASHTO T 237	15-20 minutes	-	-
Viscosity	ASTM D 2393 Spindle #2 @ 10 rpm	10-20 poises	-	-
Compressive strength @ 4 hours	ASTM C 109	1400 psi	-	Mixed with aggregate
Compressive strength @ 7 days	ASTM C 109	7000 psi	-	Mixed with aggregate
Compressive strength @ 7 days	ASTM D 695	4000-6000 psi	-	-
Compressive Modulus @ 7 days	ASTM D 695	-	170,000 psi	-
Tensile strength @ 7 days	ASTM D 638	2500 psi	-	-

Elongation at Break @ 7 days	ASTM D 638	30-40%	-	-
Tensile strength @ 7 days	ASTM C 307	1250 psi	-	-
Flexural strength (Modulus of rupture) @ 7 days	ASTM C 580	3600 psi	-	-
Hardness, Shore D	ASTM D 2240	65	-	-
Water absorption @ 24 hrs.	ASTM D 570	-	0.5%	-
Thermal compatibility	ASTM C 884	passing	-	-
Effective shrinkage	ASTM C 883	passing	-	-
Adhesion to concrete	ACI method 503R-30	100% failure in concrete	-	-

Information above is for material and curing conditions at 75±2 ºF and 45-55% relative humidity.

(b) Fine aggregate. Provide an aggregate wearing surface to be broadcast into a liquid binder according to the manufacturer's specifications. Use aggregate that is typically used for high performance surfaces. Provide aggregate consisting of clean, hard, durable fragments such as flint, chert, emery, or basaltic sand. Optimize particle material, size, shape and surface texture for the binder. Provide aggregate with a proven record of durability in this type of application. Store aggregate in a dry, moisture-free atmosphere. Fully protect the aggregate from any contaminants on the job site and store so as not to be exposed to rain or other moisture sources. Alternate aggregates may be used as approved by the Engineer. Provide aggregate with at least 10% aluminum oxide, conforming with the requirements of Table 579-2 and Table 579-3.

Table 579-2
Fine Aggregate Gradation

Sieve Size	% passing (min.)	% passing (max.)
No. 4	100	-
No. 8	30	75
No. 16	-	5
No. 30	-	1
No. 200	-	0.2

Table 579-3
Fine Aggregate Properties

Property	Test Method	Minimum	Maximum
Los Angeles Abrasion (after 500 revolutions)	AASHTO T 96	-	40%
Mohs Hardness	-	7	-

Moisture content (by weight)	AASHTO T 255	-	0.2%

Known manufacturer's or suppliers of compatible systems include:

1) Re-Deck Bridge Wearing Course by SSI,
2) Flexolith by Tamms Industries,
3) Sikadur 21 Lo-Mod LV Primer and Sikadur 22 Lo-Mod Binder by Sika Corporation,
4) Pro-poxy Type III DOT by Unitex.

Construction Requirements

579.03 General. Apply the overlay system in accordance with these specifications at the locations indicated on the plans. The quantities and rates shown are for typical situations only. The exact quantities and rates will be as recommended by the manufacturer.

579.04 Qualifications. The contractor or subcontractor must provide substantiating evidence of having a minimum of five years experience in the use and application of similar specified materials or retain the services of a manufacturer's representative with said experience.

579.05 Submittals. Submit the manufacturer's recommendations for the proposed material to the Engineer at least 14 days prior to use. Provide a certified report from a Government approved laboratory and a manufacturer certification verifying the materials are in accordance with this specification.

579.06 Trial application. Prior to constructing the overlay, at a location approved by the Engineer, place one or more trial overlays on a previously constructed concrete base to determine the initial set time and to demonstrate the effectiveness of the mixing, placing, and finishing equipment proposed. Make each overlay at least 12 feet wide and at least 6 feet long and the same thickness as the overlay to be constructed. Construct the trial overlay under conditions and using equipment that are similar to the expected and those to be used for construction of the final overlay.

579.07 Equipment. Use equipment for cleaning the existing concrete surface and mixing and applying the epoxy-aggregate system in accordance with the epoxy manufacturer's recommendations as approved by the Engineer prior to commencement of any work.

579.08 Surface preparation. Prepare the surface for application of the overlay by shotblast, abrasive blasting, hydroblasting, or cleaning in any way acceptable to the epoxy manufacturer and the Engineer, so as to roughen the surface remove all grease, oils, paint, dirt, or any other contaminants that could interfere with the proper adhesion of the epoxy overlay system in accordance with the following requirements.

579.09 Acceptability of surface preparation. Acceptability of the surface preparation will be determined by the Engineer, and may include the use of a vertical axis pull bond test. Perform the test in accordance with ACI 503R-30.

(a) This test consists of bonding a 2 inch diameter sandblasted steel disk to the prepared substrate by using a fast setting epoxy, and pulling it from the substrate by applying a vertical force.
(b) The number of tests needed will be determined by the Engineer, however, normally one test will be performed for approximately each 1000 square feet of overlay area.
(c) Substrate preparation will not be approved unless at least 90% of the bonded steel disk surface has retained substrate concrete exceeding ¼ inches in depth.

(d) At the discretion of the Engineer, the pull-out test may be carried out on the first layer or subsequent layers.
(e) The minimum acceptable bond strength on normal weight concrete is 200 psi.
(f) Repair all bond tests locations with epoxy overlay in accordance with this specification.

579.10 Application of epoxy-aggregate overlay. Do not apply the overlay unless the ambient temperature is a minimum of 60°F and rising, and the concrete deck temperature is at least 60°F. At cooler temperatures condition the material at 75°F at least 24 hours prior to use. In addition, do not begin overlay application until the concrete deck is completely surface dry. Values shown in this specification are typical of general installations. Use actual values and application rates per manufacturer's recommendations.

(a) Mixing of epoxy components - Thoroughly stir components A and B in their own containers prior to mixing in order to disperse any settlement which may have occurred. Proportion components A and B in strict accordance with the manufacturer's instructions and then thoroughly blend together. Mix thoroughly for 3 minutes minimum with a jiffy paddle on a low-speed (400-600 rpm) drill. Scrape the sides and bottom of the mixing bucket while mixing. Do not whip or aerate while mixing. Do not add dilutant, thinner, or other foreign material to either the individual components or the mixed epoxy.

(b) Applying the overlay – Apply the mixed epoxy to the concrete surface with squeegee, roller, or spray, or combinations thereof as approved by the Engineer following the trial application. Use an application method that applies the material smoothly, uniformly, and continuously. Do not allow the epoxy to puddle or accumulate in holes or depressions in the deck. Provide suitable coverings, such as heavy-duty drop clothes and the like, to protect all exposed areas not to be overlayed with epoxy, such as curbs, sidewalks, railings, parapets, deck joints, etc. Cleaning and repairing of damage or defacement resulting from this application will be at the contractor's expense, to the satisfaction of the Engineer.

(1) First Coat – Apply the epoxy to the concrete deck at the rate of 35-40 square feet per gallon, unless otherwise recommended by the manufacturer. While the epoxy is still wet broadcast the aggregate at the rate of 9-14 pounds per square yard or until no wet spots are visible. Broadcast the aggregate by sprinkling or dropping vertically in such a manner so as to not to violently disturb the wet epoxy film. After this first coat has cured sufficiently to sustain working traffic, remove any excess aggregate remaining by sweeping.

(2) Second Coat – Apply the second coat in a manner identical to the application of the first coat, except that the coverage of the epoxy will be 18-25 square feet per gallon and the aggregate will be broadcast at the rate of 12-14 pounds per square yard or until no wet spots are visible. After the second coat has cured sufficiently to sustain working traffic, remove all excess aggregate remaining by sweeping.

(3) Third Coat – If required, apply the third coat in the same manner as the second coat.

579.11 Curing. Allow the epoxy overlay to cure sufficiently before subjecting it to loads or traffic of any nature that may damage the overlay. The cure time will be dependent upon the ambient and deck temperatures. The field cure, if approved by the Engineer, may be determined as follows:

(a) The overlay may be considered cured to a firm, hard state when no movement of the overlay can be detected when pressure is applied with the ball of the foot to the overlay. The cure schedule in Table 579-4 is provided as a guide; however the actual degree of cure and suitability for traffic on the actual epoxy overlay will be determined by the manufacturer, as approved by the Engineer.

Table 579-4
Curing Guide

Degrees	Hours

55	10
60	8
75	5
85	4
95	3

579.12 Repair or surface defects. Use an identical repair method for surface defects in the overlay to that used for the application of the overlay. Repair all surface defects to the satisfaction of the Engineer before acceptance of the work.

Measurement

579.13 Measure Section 579 items listed in the bid schedule according to Subsection 109.02 and the following as applicable.

Measure concrete overlay (thin bonded epoxy overlay) by the square yard.

Do not measure trial overlay application for payment.

Payment

579.14 The accepted quantities, measured as provided above will be paid for at the contract price per unit of measurement for the pay items in the bid schedule. Payment will be full compensation for the work prescribed in this section.

REVISION OF SECTION 603
SANITARY SEWER SERVICE

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 the construction of a sanitary sewer system in accordance with the plans and specifications. This work will also include placing continuous underground tracer wire along the sewer main and services. The tracer wire should be a minimum thickness of 10-gage or approved equal.

Item 603-50004, 4 Inch Plastic Pipe shall be used for sanitary sewer services. Limits of construction for 4 Inch Plastic Pipe shall be from the sanitary main, including connection at the sanitary sewer main, to the right-of-way at the point of connection to the existing service line. Sanitary sewer services shall be located prior to beginning excavating or grading.

Subsection 603.02 shall include the following:

All work and materials shall be in accordance with the following:

(a) *Interruption of Service*. Twenty four hours prior to the interruption of service, the contractor shall notify all users whose service will be interrupted in order for them to make provisions for sanitary shut-down. For sanitary sewers servicing commercial areas (i.e., restaurants) 48 hours prior notice shall be given, and work affecting the shut-down shall only be performed between the hours of 1:00 a.m. and 5:00 a.m. No line in service will be shut-down for more than an eight hour period at one time. Prior approval by the Engineer is required for all shut-downs. In the event that shut-down cannot be placed back in service in the eight hour period, the Contractor shall coordinate with property owners and shall have a system capable of transferring or by-pass pumping all flows to a downstream segment of the line in place and approved by the Engineer.

Work must be continuous to bring all customers back to full service as quickly as possible when a transfer system is in use. This work shall not be paid for separately but included in the work.

(b) *System Layout*.

1. *General*. All sanitary sewer mains shall be installed in dedicated rights-of-way or public easements. Sanitary sewer mains shall be straight between manholes, both in horizontal and vertical alignment.

The Sanitary sewer can be replaced in it's existing location or along side the existing line as long as the new alignment meets the requirements of this section and is approved by the engineer. Sanitary sewer mains shall be laid a minimum of ten feet horizontally from any existing or proposed water mains. Upon written approval by the Engineer, a sanitary sewer main may be laid closer than ten feet to a parallel water main if it is laid in a separate trench and if the elevation of the invert of the water main is at least eighteen inches above the crown of the sewer main and, in addition, polyvinyl chloride pressure pipe is used for the sewer main. Pipe bedding material shall conform to City and County of Denver Wastewater Standard Construction Specifications.

2. *Sanitary Sewer Line crossing under a Water Line*. When there is less than 12 inches of vertical clearance between the sanitary sewer and the water main, the sanitary sewer shall be encased in concrete a minimum of nine feet on each side of the centerline of the crossing or polyvinyl chloride pressure pipe in accordance with American Water Works Association C900 Class 200 may be used.

3. *Sanitary Sewer Line Crossing Over Water Line*. In all cases, regardless of vertical clearance, the sanitary sewer shall be encased in concrete a minimum of nine feet on each side of the centerline of the crossing or polyvinyl chloride pressure pipe in accordance with American Water Works Association C900 Class 200 may be used.

4. *Sanitary Sewer Line Crossing Under a Storm Sewer Line*. When there is less than 12 inches of vertical clearance between the sanitary sewer line and the storm sewer line, the sanitary sewer line shall be encased in concrete a minimum of nine feet on each side of the centerline of the crossing or polyvinyl chloride pressure pipe in accordance with American Water Works Association C900 may be used.

5. *Sanitary Sewer Line Crossing Over a Storm Sewer Line*. The sanitary sewer line shall be encased in concrete a minimum of nine feet on each side of the centerline of the crossing or polyvinyl chloride pressure pipe in accordance with American Water Works Association C900 may be used. In addition, each joint of the storm sewer within nine feet of the centerline of the crossing shall be encased in concrete.

6. *Limits on Vertical Separation*. Under no circumstances shall the vertical clearance between any lines involving a water line, sanitary sewer line, or storm sewer be less than 12 inches without prior written approval from the Engineer.

Only those pipeline materials described in this section are approved for sanitary sewer installations. Any other material proposed as an equal shall be approved by the Engineer prior to construction. All pipe materials to be incorporated in the construction of sanitary sewers shall conform to the requirements specified herein. All materials furnished shall be new and undamaged. Everything necessary to complete all installations shall be furnished and installed whether shown on the plans or not, and all installations shall be completed and fully operational. Acceptance of materials or the waiving of inspection thereof shall in no way relieve the contractor of the responsibility for furnishing materials meeting the requirements of these specifications.

All materials delivered to the job site shall be adequately housed and protected to ensure the preservation of their quality and fitness for the work.

(c) *Defects*. The presence of any of the following defects in an individual pipe, or in a shipment of pipe, may constitute sufficient cause for rejection of the pipe. Rejected materials shall be removed from the work site within 24 hours unless otherwise permitted by the Engineer.

– Pipe length varying more than two inches from the specified length. Pipe shall not be ordered in random lengths.

– Pipe having a deviation from straight that exceeds the following:

– Length of Pipe in Feet = Maximum Deviation in Inches 32

– Pipe that has been patched or repaired without written approval of the Engineer.

– Pipe damaged during shipment or construction.

– Any deficiencies noted in applicable ASTM Specifications

(d) *Certification.* A manufacturer's certification that material was manufactured and tested in accordance with applicable ASTM designations, together with a report of all test results, shall be required by the Engineer prior to final acceptance of the work.

CONSTRUCTION REQUIREMENTS

Subsection 603.03 shall include the following:

(a) *Sanitary Sewer Installation*

1. *General*. The Engineer shall be notified at least 48 hours in advance of any pipe installation. No pipes shall be backfilled until they have been inspected by the Engineer. Alignment and grade of the pipe and the location of fittings, and manholes shall be staked under the supervision of a professional surveyor registered in the State of Colorado.

Proper implements, tools and facilities shall be provided and used by the contractor for the safe and convenient execution of the work. All pipe fittings, and manhole sections shall be carefully lowered into the trench by means of a derrick, ropes or other suitable tools or equipment to prevent damage to sanitary sewer line material. Under no circumstances shall sanitary sewer line materials be dropped or dumped into the trench.

All pipe fittings shall be carefully examined for cracks and other defects immediately before installation. The groove in the bells of the pipe shall be full and continuous or the pipe will be rejected. Defective pipe or fittings shall be removed from the job site within 24 hours of notification by the Engineer. All foreign matter or dirt shall be removed from the interior and ends of the pipe before they are lowered into position in the trench and prior to connection.

Every precaution shall be taken to prevent foreign material and trench water from entering the pipe and fittings. During construction, the contractor shall provide and maintain adequate equipment to properly remove and dispose of all water entering the trench and any other part of the work.

2. *Pipe*. Pipe shall be laid from downstream to upstream with spigot ends pointing downstream. All pipe shall be placed true to line and grade and carefully centered and with a smooth invert at the joint. The joint shall be made in a workmanlike manner and shall be watertight. Immediately before joining two lengths of pipe, the inside of the bell and the outside of the spigot end and the gasket shall be thoroughly cleaned. Caution shall be exercised to ensure that the correct type of gasket is used. A thin film of gasket lubricant shall be applied to the inside face of the gasket and the spigot end of the pipe. The spigot end of the pipe shall be placed in the bell with care to prevent the joint from contacting the ground. The joint shall be completed by pushing the pipe home with a slow steady pressure, without jerky or jolting movements. Pipe furnished without a depth mark shall be marked before assembly to ensure insertion to the full depth of the joint. The pipe shall then be properly set and brought to correct line and grade. The pipe shall then be secured in place by installation of bedding material and backfill

At times when installation is not in progress, the open ends of the pipe shall be closed with a watertight plug. Cutting of pipe for inserting closure pieces shall be done in a neat and workmanlike manner without damage to the pipe or lining, leaving a smooth end at right angles to the axis of the pipe. Pipe ends shall be smooth and beveled with a file or other tools according to the pipe manufacturer's recommendations.

Extra care should be used in handling PVC pipe during cold weather due to the reduced flexibility and impact resistance as temperatures approach and drop below freezing. PVC pipe to be stored outside and exposed to sunlight for more than 30 days shall be covered with an opaque material such as canvas. Clear plastic sheets shall not be used to cover the pipe. Air circulation shall be provided under the covering. Any over-exposed pipe, as determined by the Engineer, will not be permitted for installation.

No pipe or appurtenant structure shall be installed upon a foundation in which frost has penetrated or at any time when the Engineer deems there is a danger of ice formation or frost penetrations at the bottom of the excavation. No pipe or appurtenant structure shall be installed unless backfilling can be completed before the formation of ice and frost.

If directed by the Engineer based upon the requirements for encasement above, the Contractor shall encase the sanitary line utilizing Class B Concrete in accordance with Section 602.

3. *Service Lines*. Sanitary sewer services shall be made with Wye's or Tee's conforming to ASTM D3034 or F679 whichever is applicable. Only gasketed fittings including Saddle Wye's and Tee's with gaskets for the saddle and joints that are approved for sanitary sewer service connection to existing PVC sanitary sewers will be used. Stainless steel straps shall be used to secure the saddle fittings to the main pipe.

Wyes shall be angled upwards so that the upper invert of a one-eighth bend connected to the fitting will have an elevation equal to or higher than the inside crown of the sewer main. As-built measurements shall be made by the contractor or his representative to reference the wye or riser connection to the nearest manhole before backfill. Said measurements shall be carefully and accurately made and recorded and shall be shown on the as-built plans furnished to the Engineer prior to acceptance.

The contractor shall locate the existing service lines to be replaced and shall install replacement services concurrently with the installation of the new sanitary sewer line. New services shall extend to the property line and shall be connected to the existing sanitary service at that point. The contractor shall take care during excavation operations to avoid damage to existing service lines. Service lines that become damaged as a result of construction shall be repaired or replaced promptly, to minimize the inconvenience to the property owner and shall be paid for by the contractor.

For the purpose of estimating quantities, conservatively one service connection was assumed per house, building or business; however based on past experience, there will likely be some combined connections for some building. In that case notify the engineer. Separate combined services if possible.

The Contractor is notified that private property owners may be interested in replacing water and sewer service line connections on their respective private property, and may approach Contractor to bid on and perform said work. Any such work shall be contracted directly with each private property owner, and is not part of this subject contract. The Contractor's election to take on such work with private property owners shall not relieve them of their contractual responsibility to meet the schedule requirements of this subject contract. Due to the level of interest expressed by private property owners prior to advertising this project, the Engineer may request that the selected contractor, after execution of the contract and in cooperation with the City, engage in discussions with a collective group of private property owners to optimize pricing and execution of work.

4. *Testing.* Final acceptance of sanitary sewer system will require a video inspection by camera scope. Coordinate with the engineer prior to video inspection and submit a copy of the video inspection on a disk. Deficiencies determined during the inspection will require corrective action. If deficiencies persist, the

engineer may require that sanitary sewer lines shall be tested to meet CDPHE standards for installation of sanitary sewer mains and their appurtenances.

5. *Connections to Existing Manholes*. Sewer pipe connections to existing manholes where there is no existing pipe stubbed out shall be made in such a manner that the finished work will conform as nearly as practicable to the requirements specified for new manhole construction. The contractor shall break out as small an opening in the existing manhole as necessary to insert the new sewer pipe. The existing concrete foundation bench shall be chipped to the cross-section of the new pipe in order to form a smooth continuous invert similar to what would be formed in a new concrete base. Where practical, the downstream invert shall be plugged during construction to prevent storm and non-sewage flow from entering the system. The contractor shall pump out and clean the manhole before removing the plug.

Cement mortar shall be used to smoothly finish the new invert and to seal the new line, both inside and outside, so the junction is watertight.

6. *New Manholes Connections to Existing Mainlines.* Manholes to be place around existing sanitary mainlines shall be done in such a manner as to not damage the existing main until the new manhole is complete. The following is a rough description of the process:

a. A cast-in-place slab base shall be built around the existing mainline to approximately 6 inches over the top of the existing pipe. Seals shall conform to AASHTO M-198.

b. Pre-cast manhole risers and grade rings shall be placed to required manhole grade.

c. Once proposed new sewer is connected to the new manhole, the existing pipe in the new manhole may be broken, the proposed line can be placed in service, and the existing sanitary line may be removed.

7. *Drop Manholes.* A drop pipe shall be provided for a sewer entering a manhole at an invert elevation of 2.5 feet or more above the outgoing manhole channel invert. There is no limit on the length of a drop pipe. Drops shall be constructed of concrete encased PVC pipe outside the manhole, unless otherwise authorized by the Engineer.

Subsection 603.06 shall be revised to include the following:

The length of trench permitted to be open at any one time may be limited when, in the opinion of the Engineer, such limitation is necessary for the safety and convenience of the public. All excavation, trenching, shoring, and stock-piling of excavated materials shall be in strict compliance with the applicable OSHA rules and regulations.

When temporary plugs are needed to accommodate construction phasing, they shall be precast concrete or match the pipe material being plugged.

Subsection 603.07 shall be revised to include the following:

The Contractor shall use all precautions to secure water-tight, well-constructed joints in all pipe sewer work. All joints shall be constructed in such a manner that the alignment and flow line grade of the bottom of the pipe is accurately maintained.

Subsection 603.11 and 603.12 shall be revised to include the following:

Installation and removal of temporary plugs will not be paid for separately, but shall be included in the work.

BASIS OF PAYMENT

Pay Item	**Pay Unit**
Sanitary Service Connections	Each
4 inch Plastic Pipe	Linear Foot
6 inch Plastic Pipe	Linear Foot
8 inch Plastic Pipe	Linear Foot

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REVISION OF SECTION 603
SANITARY SEWER SERVICE

Underground Tracer Wire for Sanitary sewer mains and services will not be paid for separately, but shall be included in the cost of the pipe items.

Dewatering, temporary sewer pumping, and temporary bypass systems will not be measured for payment, but shall be included in the cost of the pipe items.

Fittings required for sanitary sewer service connections shall not be paid for separately, but shall be included in the cost of Item 603, 4 Inch Plastic Pipe.

Fittings required for sanitary sewer mains shall not be paid for separately, but shall be included in the cost of Item 603, 6 Inch Plastic Pipe.

Fittings required for sanitary sewer mains shall not be paid for separately, but shall be included in the cost of Item 603, 8 Inch Plastic Pipe.

Sanitary Service Connections shall be full compensation for all labor, materials and equipment needed to establish these sanitary service connections described above.

Video inspection and corrective actions will not be measured for payment.

Any encasement of the sanitary line shall be paid for as Item 601, Concrete Class B (Miscellaneous).

REVISION OF SECTION 605
SUBSURFACES DRAINS

BASIS OF PAYMENT

Subsection 605.06 shall include the following:

The outlet pipe, from the back of curb or sidewalk to the daylight location on the slope, shall be 4” non-perforated pipe.

Payment will be made under:

Pay Item	**Pay Unit**
4 Inch Perforated Pipe Underdrain	Linear Foot

Non-perforated outlet pipe will be measured and paid as 4 Inch Perforated Pipe Underdrain.

REVISION OF SECTION 608
SIDEWALKS AND BIKEWAYS

Section 608 of the Standard Specifications is hereby revised for this project as follows:

DESCRIPTION

Subsection 608.01 shall include the following:

This work shall include the construction of sidewalk chase drains and concrete turn-downs in accordance with these specifications and in conformity with the lines and grades shown on the plans.

CONSTRUCTION REQUIREMENTS

Subsection 608.03 (a) shall include the following:

Excavation for sidewalk chase drains if shown on the plans shall be included in the work.

METHOD OF MEASUREMENT

BASIS OF PAYMENT

Subsection 608.06 shall include the following:

Payment will be made under:

Pay Item	Pay Unit
Concrete Sidewalk (6 Inch)	Square Yard
Concrete Sidewalk (4 Inch)	Square Yard
Chase Drain	Each

REVISION OF SECTION 613
ELECTRICAL CONDUIT

Section 613 of the Standard Specifications is hereby revised for this project as follows:

DESCRIPTION

This work includes furnishing and installing either (HDPE) High Density Polyurethane or PVC electrical conduit. All materials furnished, assembled, fabricated and installed under this item shall be new, corrosion resistant and in strict accordance with the plan sheets and these Special Provisions.

MATERIALS

All conduits shall be Schedule 80 in the diameters, quantities and colors as shown on the project detail sheet and shall be compliant with all ASTM and Bellcore TW-NWT-000356 requirements.

All HDPE conduit shall be factory lubricated, low friction, high-density conduit constructed of virgin high-density polyethylene resin. Conduit shall be capable of being coiled on reels in continuous lengths, transported, stored outdoors, and subsequently uncoiled for installation, without affecting its properties or performance.

PVC conduit shall be certified by the manufacturer as meeting ANSI/UL 6 and 651. The manufacturer shall be ISO 9000 compliant.

CONSTRUCTION

Electrical Conduit (Bored) shall be HDPE and installed using a trenchless technology of either jacked conduit or directional boring.

Electrical Conduit (Plastic) shall be PVC or HDPE and installed by direct burial methods such as plowing, open trenching, or other excavation methods. When PVC is used, expansion fittings shall be installed at 100’ intervals.

One conduit per bundle shall have a copper tracer wire of at least 12-gauge in a single conduit. In trenches containing multiple conduits, the tracer wire shall not be installed in the same conduit as the fiber.

Each individual conduit shall be equipped with a pull tape of 1250 pounds tensile strength and be of a design to prevent cutting or burning of conduit walls during cable installation.

The Contractor has the option of using pull tape in all conduit installations, irrespective of length.

CONSTRUCTION REQUIREMENTS

Place electrical conduit a minimum of 30” deep with a spacing of 30” from center of pipe to center of pipe.

The installation of conduit shall be performed in such a manner as to avoid unnecessary damage to streets, sidewalks, utilities, landscaping, and sprinkler systems. Excavations and conduit installation shall be performed in a continuous operation. All trenches shall be backfilled by the end work day. The material from trenching operations shall be placed in a location that will not cause damage or obstruction to vehicular or pedestrian traffic or interfere with surface drainage.

The Contractor shall take all necessary precautions to avoid heaving any existing asphalt/concrete mat or over-excavating a trench, whether caused by equipment directly or by dislodging rocks and boulders. Any such heaving or over-excavation shall be repaired or replaced at the Contractor’s expense. The Contractor shall bear the cost of backfilling all over-excavated areas with the appropriate backfill material as approved by the project engineer.

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REVISION OF SECTION 613
ELECTRICAL CONDUIT

The Contractor shall restore all surface materials to their preconstruction condition, including but not limited to pavement, sidewalks, sprinkler systems, landscaping, shrubs, sod, or native vegetation that is disturbed by the conduit installation operation. All repairs shall be included in the cost of the conduit.

If the Contractor is unable to bore the conduit at the lengths shown on the plans from access point to access point, all splice couplings and associated work to splice conduit shall be included in the cost of this item. The coupling technology shall allow the conduit to be connected without the need for special tools, and shall form a watertight, airtight seal. Breaking force between segments shall exceed 250 pounds of force. No metal fittings shall be allowed. No elevation difference between the conduit run and the splice location will be allowed. Conduit splices shall be kept to a minimum and all locations shall be approved by the project engineer. Additional pull boxes shall not be substituted for splices.

Conduit plugs shall be supplied and installed in all conduit ends as soon as the conduit is installed. Conduit shall be plugged at all termination points such as pull boxes, manholes, controller cabinets, and node buildings. Conduits containing cable shall be plugged with durable and reusable split type plugs, fabricated without metallic parts, and allow easy removal and reinstallation around in-place cables. Split type plugs shall provide a water and air-tight seal of at least 50 psi and shall be installable by hand without using special tools and without damaging the cable. All plugs shall be correctly sized to fit the conduit being plugged. Empty conduits shall be sealed with removable type duct plugs that provide a watertight barrier.

All conduits shall use sweeps to elevate the buried conduits to within 4 inches of the bottom of the pull box or grade, as shown in project details. The sweeps shall be terminated within the pull boxes and manholes to allow for easy installation and removal of the conduit plugs. The sweeps shall be set above the ground surface within the pull box at a height that does not interfere with the coiling of the fiber optic cable.

All conduit runs containing fiber optic cable shall have a limited number of bends. The sum of the individual conduit bends on a single conduit run between two pull boxes shall not exceed 360° .The preferred limit is 270° . No individual bend shall be greater than 90°. All conduit bends shall have a minimum acceptable radius. The minimum radius for 90° bends is 48 inches, and the minimum radius for all other bends is 24 inches.

If new conduits are installed in existing pull boxes, manholes or cabinet bases the Contractor shall carefully excavate around the pull box or manhole and install the new conduit as shown in the plans. The Contractor shall not damage the existing pull box, manhole or their contents. If the existing pull box, lid, or the concrete collars are cracked or damaged during conduit installation, the Contractor shall restore the damaged section to preconstruction condition at no additional cost.

METHOD OF MEASUREMENT

Electrical Conduit shall include all electrical wire and/or telephone wire per end equipment requirements. Conduit shall also include anchors, bands, skids, sweeps, pull tape, copper tracer wire, adapters, expansion couplings, conduit plugs, installation equipment, adhesives, labor, and all other items necessary to complete the work.

BASIS OF PAYMENT

Electrical Conduit contract unit price shall be full compensation for work described above, specified in the plans, and complete and in place.

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REVISION OF SECTION 613
ELECTRICAL CONDUIT

Payment will be made under:

Pay Item	**Pay Unit**
4-Inch Electrical Conduit	Linear Foot

REVISION OF SECTION 613
LIGHTING

Section 613 of the Standard Specifications is hereby revised for this project as follows:

DESCRIPTION

This work will include all labor, equipment, materials, and utility coordination to place a pedestrian lighting system along Soda Creek Road according to the plan drawings and details.

MATERIALS

Furnish all materials necessary to complete the lighting system in accordance with the plan drawings and notes.

CONSTRUCTION

Obtain all necessary permits prior to beginning work on pedestrian lighting. Excavate and backfill according to Section 206. Provide survey staking for conduit, poles, and service location according to Section 625. Provide all of the necessary coordination with Xcel Energy, in order for them to complete the meter set for the system.

METHOD OF MEASUREMENT

Pedestrian Lighting will be measured by the Lump Sum installed and accepted, and will include survey, excavation, backfill, conduit, bases, poles, lights, wiring, clock/photo cell, and all other materials required to complete the work system.

Electrical Service will be measured by the lump sum installed and accepted and will include furnishing and installing all materials including electrical pedestals, grounding/bonding, junction boxes, service entrance feeders, spare conduit, and any other materials required to complete the Work; providing all materials, fabricating, and installing in accordance with the Drawings and Specifications and any applicable local, state or federal requirements; excavation and backfill as required for installation and all other means and methods specified in the electrical drawings and specifications; coordination with Xcel Energy.

METHOD OF PAYMENT

Pay Item	**Pay Unit**
Pedestrian Lighting	Lump Sum
Electrical Service	Lump Sum

REVISION OF SECTION 619
WATER LINES

Section 619 of the Standard Specifications is hereby revised for this project as follows:

DESCRIPTION

Subsection 619.01 shall include the following:

This work consists of the construction of a water line system in accordance with the plans and specifications.

8 inch PVC C900 Pipe shall be used for the Soda Creek mainline. 4 inch PVC C900 Pipe, shall be used for the raw water line and shall be Purple color. 6 inch PVC C900 shall be used for fire hydrant connections. Limits of construction for 6 PVC C900 shall be from the 8 inch mainline to the Fire Hydrant assembly.

This work also includes placing continuous underground tracer wire along PVC water mains. The tracer wire shall be a minimum 10-gage thickness or approved equal.

CONSTRUCTION REQUIREMENTS

All water distribution systems shall be constructed in accordance with the plans and specifications. Work shall be in accordance with the following:

(a) *Interruption of Service.* The City's Public Works Department will operate all existing valves, hydrants, blow-offs and curb stops. No valve or other control device on the existing public system will be operated for any purpose by anyone other than the City without prior written authorization. Twenty-four hours prior to the interruption of service, the Contractor shall notify all users whose service will be interrupted in order for them to make provisions for necessary water storage. For water mains servicing commercial areas (i.e., restaurants) 48 hours prior notice shall be given, and work affecting the shut-down shall only be performed between the hours of 1:00 a.m. and 5:00 a.m. No line in service will be shut down for more than a four-hour period at one time. Prior approval by the Engineer is required for all shutdowns. In the event that shut-down cannot be placed back in service in the four hour period, the Contractor shall coordinate with property owners and shall have a system capable providing all flows to properties in place and approved by the Engineer. Work must be continuous to bring all customers back to full service as quickly as possible when a shut-down occurs. This work shall not be paid for separately but included in the work.

(b) Notify the Engineer and Idaho Springs City Hall 24 hours prior to any planned water service outage and include a timeframe that the outage will begin and end.

(c) Immediately notify the Engineer, Idaho Springs City Hall, and affected users in the case of an accidental or unplanned outage.

(d) *Disinfection and Testing of Domestic Water Lines*. Water lines shall be disinfected in accordance with the following procedure.

1. Test new mains at intervals of 1000’ or less of new pipe. Do not place runs longer than 1000’ without testing and receiving acceptable results.

2. Flush and satisfactorily disinfect new water lines prior to placing in service in accordance with AWWA C651.

3. Clean and swab the interior of the pipe, fittings, valves, or appurtenances with a five percent [5%] (50,000 ppm) hypochlorite disinfecting solution if dirt, trench water, or other contaminants enter the pipe or will not be removed by flushing operations.

4. Manipulate valves to prevent the disinfection solution from flowing back into the line supplying the water or into adjacent parts of the in-service distribution system.

5. Operate valves and other appurtenances while the lines are filled with heavily chlorinated water.

6. Preliminary Flushing.

   A. Flush pipelines at a minimum velocity of 2.5 ft. /sec. to remove foreign material prior to disinfection. Do not use preliminary flushing if the tablet method of disinfection is approved by Engineer.

7. Final Flushing.

   A. Flush chlorinated water from the lines after chlorination until the chlorine concentration is no higher than that prevailing in the system, or less than one (1) mg/l, whichever is higher.

(e) *Bacteriological Tests*. Bacteriological tests shall be performed according to the following:

1. Collect samples from the end of the pipeline after final flushing and prior to placing water lines in service and test for bacteriologic quality to show the absence of coliform organism.

   A. Collect samples in sterile bottles from a corporation stop with a copper tube gooseneck assembly installed in the main.

   B. Do not collect samples from a hydrant or hose.

2. The number and frequency of samples shall conform to the requirements of the public health authority having jurisdiction.

   A. In no case shall the number be less than one (l) sample for lines with chlorinated supplies and two (2) samples collected twenty-four (24) hours apart for unchlorinated supplies.

3. Repeat disinfection until satisfactory samples have been obtained if the initial disinfection or subsequent disinfections fail to produce satisfactory samples.

(f) *Testing Piping Systems*. Piping systems shall be tested in accordance with the following:

1. Testing. This work covers the hydrostatic testing of water distribution and transmission lines. Hydrostatic testing of the 4” raw water line is required. Conduct pressure test and leakage test concurrently. Do not test until at least seven (7) days have elapsed after the last concrete thrust restraint has been cast. No allowance shall be made for pressure reductions accomplished by means of pressure-reducing valves or other mechanical means. Prior to tests, Contractor and Engineer shall inspect valves within the test section to make sure they are fully open.

   A. Test with the hydrant main valve closed and the auxiliary line valve open.

2. Pressure Test. Slowly fill pipe with water. Remove all air. Install corporation cocks at high points to evacuate the air if permanent air vents are not located there. Leave pipe filled with water at working pressure for a minimum of seventy-two (72) hours prior to the hydrostatic pressure test.

   A. Test Pressure. For steel pipe, ductile iron pipe, PVC pipe, and pre-stressed concrete cylinder pipe use a test pressure of one and one half (1½) times the working pressure measured at the lowest elevation of the pipeline test section or the working pressure plus fifty (50) psi, whichever is greater. Maintain the test pressure within plus or minus five (±5) psi of the test pressure for at least two (2) hours.

B. Working Pressures are as follows: 80 psi. CAUTION: Do not exceed a test pressure of 150 psi maximum at the lowest elevation in the test section.

3. Leakage Test. Leakage is the quantity of water that must be added to the pipeline to maintain pressure within five (5) psi of the specified test pressure after the air has been expelled and the pipe is filled with water.

A. Maximum allowable leakage. For ductile iron pipe and cast iron pipe:

$$L = \frac{(S)(D)(P^{1/2})}{133{,}200}$$

Where:

L = Maximum allowable leakage in gallons per hour
D = Nominal pipe diameter in inches
P = Average test pressure during the leakage test in psig
S = Length of pipe tested in feet

B. When testing against closed, metal-sealed valves, an additional leakage per closed valve of 0.0078 gal/hour/inch of nominal valve size will be allowed.

C. Repeat tests until the leakage is within the permitted allowance.

a. All testing shall meet the requirement of the Colorado Department of Public Health & Environment (CDPHE). The Contractor shall be responsible for obtaining all CDPHE approvals.

(g) *System Layout*

1. All mains shall be installed in dedicated rights-of-way or public easements. Under no circumstances should water lines be installed parallel to and directly below any concrete such as sidewalks, curbs, or gutters. Lines shall normally be located as shown on the plans, unless otherwise approved, in writing, by the Engineer.

The minimum depth of cover for water mains from the final approved grade of the surface to the top of the water main, shall be 5 feet. Where final grades have not been established, mains shall be installed to a depth great enough to ensure 5 feet of cover below the approved future grade. The maximum depth of cover for water mains shall be 6 feet below the final approved grade of the surface unless approved otherwise, in writing, by the Engineer.

Water mains shall be laid a minimum of ten feet horizontally from any existing or proposed utility. Upon written approval by the Engineer, a water main may be laid closer than ten feet to a parallel sewer main if it is laid in a separate trench and if the elevation of the invert of the water main is at least 18 inches above the crown of the sewer main and, in addition, ASTM C-900 PVC is used for the sewer main. Water mains shall be designed such that they extend the entire frontage of the property to be served or as approved by the Engineer.

The 4 inch raw water line may be placed as close as 4’ to the sanitary sewer line in Soda Creek Road and C900 PVC will not be required for the sewer main.

2. *Water Line Crossing Over a Storm Sewer Line*. When there is less than 12 inches of vertical clearance between the water main and the storm sewer, each joint of the storm sewer within nine feet of the centerline of the crossing shall be encased in concrete.

3. *Storm Sewer Line Crossing Over a Water Line*. In all cases, regardless of vertical clearance, the joints of the storm sewer shall be encased in concrete a minimum of nine feet on each side of the centerline of the crossing.

4. *Limits on Vertical Separation.* Under no circumstances shall the vertical clearance between any lines involving a water line, sanitary sewer line, or storm sewer be less than 12 inches without written approval from the Engineer.

MATERIALS

Subsection 619.02. First Paragraph, delete and replace with the following:

Materials shall meet the requirements specified in the following subsections:

Cast Iron Pipe	716.01
Welded Steel Pipe	716.02
Galvanized Pipe	716.03
Copper Pipe	716.04
Plastic Pipe (PVC C900)	716.05
Ductile Iron Pipe	716.06
Valves and Valve Boxes	716.07
Fire Hydrants	716.08
Service Connections	716.09
Encasements	716.10
Restraining Systems	716.11

CONSTRUCTION REQUIREMENTS

Subsection 619.03 shall include the following:

(b) *Pipe Installation*.

1. *General*. The Engineer shall be notified at least 48 hours in advance of any pipe installation. No pipes shall be backfilled until they have been inspected by the Engineer. Alignment and grade of the pipe and the location of fittings, valves, and hydrants shall be staked under the supervision of a professional surveyor registered in the State of Colorado. Pipe bedding material shall conform to Denver Water Engineering Standards.

Proper implements, tools, and facilities shall be provided and used by the contractor for the safe and convenient execution of the work. All pipe fittings, valves, and hydrants shall be carefully lowered into the trench by means of a derrick, ropes, or other suitable tools or equipment to prevent damage to water main materials and protective coatings and linings. Chains or cables shall not be used for handling pipe with protective coatings. Under no circumstances shall water main materials be dropped or dumped into the trench.

All pipe and fittings shall be carefully examined for cracks and other defects immediately before installation. The groove in the bells of the pipe shall be full and continuous or the pipe will be rejected. Defective pipe or fittings shall be removed from the job site within 24 hours of notification by the Engineer. All foreign matter or dirt shall be removed from the interior and ends of pipe and accessories before they are lowered into position in the trench and prior to connection. Installed ductile iron water lines shall be tested to meet AWWA C600-10 for installation of ductile iron pipe mains and their appurtenances.

Install PVC Pipe (C900) in accordance with AWWA M23 and AWWA C605.

Every precaution shall be taken to prevent foreign material and trench water from entering the pipe and fittings. During construction, the contractor shall provide and maintain adequate equipment to properly remove and dispose of all water entering the trench and any other part of the work.

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REVISION OF SECTION 619
WATER LINES

2. *Pipe*. Immediately before joining two lengths of pipe, the inside of the bell and the outside of the spigot end and the gasket shall be thoroughly cleaned. Caution shall be exercised to ensure that the correct type of gasket is used. A thin film of gasket lubricant shall be applied to the inside face of the gasket and the spigot end of the pipe. The spigot end of the pipe shall be placed in the bell with care to prevent the joint from contacting the ground. The joint shall be completed by pushing the pipe home with a slow steady pressure, without jerky or jolting movements. Pipe furnished without a depth mark shall be marked before assembly to ensure insertion to the full depth of the joint. The pipe shall then be properly set and brought to correct line and grade.

Deflection from a straight line or grade, as required by horizontal or vertical alignments or offsets, shall not exceed the maximum allowable limits set by the manufacturer's specifications. If the alignment requires deflection in excess of the allowable deflection per joint, special bends, or a sufficient number of shorter lengths of pipe shall be furnished to provide angular deflections within the limits set forth, as approved, in writing, by the Engineer.

All ductile iron pipe fittings and appurtenances shall be protected with minimum 8 mil polyethylene film wrap. Miscellaneous steel or other ferrous pipe for temporary blow-offs, etc., shall be similarly protected. After installation of the polyethylene protective wrap, the pipe shall be secured in place by installation of bedding material and backfill.

Methods for applying the wrap shall conform to the detail drawing provided with the construction drawings.

Assemble PVC pipe plain end into bell following the manufacturer’s recommendations. Ensure that the pipe is not inserted into the bell ends beyond the push lines. Utilize EBAA Mega-Stop bell protection, or approved equal, if necessary to ensure previously laid pipe joints are not impacted by ongoing installation. Do not deflect PVC pipe at the connection with ductile iron fittings.

Install tracer wire along the length of all PVC water main, connections, and hydrant laterals. Install test stations at maximum intervals of 500 linear feet. Locate the test stations at fire hydrants, gate valves, or in a valve box. Tape the tracer wire to the top of pipe using PVC tape every 4 feet along the pipe, and on each side of fittings. After backfill is complete and before placing aggregate base, test the continuity of the tracer wire in the presence of the owner.

At times when installation is not in progress, the open ends of the pipe shall be closed with a watertight plug. Cutting of pipe for inserting valves, fittings, or closure pieces shall be done in a neat and workmanlike manner without damage to the pipe or lining, leaving a smooth end at right angles to the axis of the pipe. Pipe ends shall be smooth and beveled with a file or other tools according to the pipe manufacturer's recommendations.

3. *Fittings*. Pipes shall be connected to valves and fittings by mechanical joints unless specified differently in the plans. For approved slip-on joints, the joint shall be assembled with a ratchet jack or other approved method in a manner that does not cause any damage to the pipe. Both the spigot and bell must be thoroughly clean and free from tar or other coatings and rust.

For mechanical joint pipe, the last 8 inches of the outside of the spigot end of the pipe and the inside of the bell of all fittings and gate valves shall be thoroughly cleaned to remove oil, grit, tar (other than standard coating), and other foreign matter from the joint and then a thin film of gasket lubricant shall be applied. The cast iron gland shall then be slipped on the spigot end of the pipe with the lip extension of the gland toward the bell of the fitting. Gasket lubricant shall be applied to the rubber gasket and placed on the spigot end of the pipe with the thick edge towards the gland.

After the spigot end of the pipe is placed into the bell and fully inserted the gasket shall be pressed into place within the bell so it is even around the entire joint. After the gland is positioned behind the gasket, the contractor shall install all bolts and nuts and tighten them with a torque wrench. Nuts spaced 180 degrees apart shall be tightened alternately to produce equal pressure on all parts of the gland.

Jointing shall be done, unless specifically accepted above, in accordance with AWWA Specification C-111 for a mechanical joint for ductile iron pressure pipe and fittings.

Mechanical restaints for PVC C900 Pipe shall meet the standards of "Uni-Bell's Specification Uni-B-13 "Joint Restraint Devices for Use with PVC Pipe."

(c) *Valve and Valve Box Installations*. Valves and valve boxes shall be installed where shown on the approved plans and as directed by the Engineer. Valve boxes shall be firmly supported, centered, and plumbed over the wrench nut of the valve with the box cover at or minus 1/4-inch within the surface of the finished pavement or at such other elevation as may be directed by the Engineer. Extensions to within 4 feet

of the finished grade shall be provided for valves installed with more than 5 feet of cover. All extensions shall be pinned to the valve operating nut. Earth fill shall be carefully tamped around each valve box to a minimum distance of 4 feet on all sides of the box, or to the undisturbed trench face if less than 4 feet. Valves shall have the interiors cleaned of all foreign matter before and after installation.

Gear cases shall be tightened and the valve shall be inspected in opened and closed positions to insure that all parts are in working condition prior to installation. The cases shall be supported by bricks or other means to prevent any shock or stress being transmitted to the valve.

(d) *Anchorage and Blocking.* Provide concrete thrust blocks and anchors for preventing pipe movement at push-on or mechanical joint plugs, tees, crosses, or bends deflecting eleven and one-quarter degrees (11¼˚) or more, reducers and valves installed in piping subjected to internal hydrostatic pressure in excess of thirteen (13) psi.

1. Tie concrete anchors to fittings, reducers, and valves by two (2) U-shaped No. 5 rebars.

   A. Bend ends of rebar ninety degrees (90º) out, length three inches (3").

   B. Rebar embedment: One-half (½) pipe O.D. plus six inches (6").

2. Provide a concrete thrust block under flanged valves that have valve boxes.

3. Extend concrete from the fitting or valve to solid, undisturbed earth. Construct so joints and drain holes are clear and accessible.

(e) *Thrust Blocks*. Thrust block shall be sized and installed according to the detail provided in the construction drawings. The contractor shall excavate as required to ensure that the thrust blocks are placed against undisturbed soil and shall form the sides of the thrust block to provide the size and shape required. When it is impossible, because of over excavation or other causes, to pour a thrust block against undisturbed earth, harness rods shall be used to anchor the fittings to the main in addition to the thrust block and as required by the Engineer. After the concrete has been placed and has set, the contractor shall remove all forming materials prior to backfilling around the thrust block. Concrete for the thrust blocks shall be Class B in accordance with Section 601.

The blocking shall be placed so that the pipe and fitting joints will be accessible for repair. A bond breaker shall be placed between the fittings and the thrust block. Backfill may be placed over the thrust blocks once the surface has set sufficiently to resist the weight of the backfill. However, no tamping or compacting shall be allowed above the thrust block for a minimum of 24 hours after placement. Concrete must set a minimum of 48 hours prior to the initial filling of the line.

(f) *Connection to Existing Mains.* At locations where connections to existing water mains are to be installed, the contractor shall locate the existing mains, both vertically and horizontally, and shall verify their exact size in advance of the time scheduled for making the connections. The contractor shall notify and schedule the connection with the Engineer.

Prior to connecting to existing water mains, the contractor shall have all men, materials, and equipment ready to connect the fitting to the existing main to keep the shut-off time to a minimum. As soon as possible after making the connections, the contractor shall flush the connection to prevent any contamination of the existing facilities. The contractor shall take every precaution necessary to prevent dirt or debris from entering the main.

(g) *Fire Hydrant Installation*. Immediately before installation of a hydrant, the following operations shall be performed:

1. The hydrant shall be thoroughly inspected for any defects or damage, and to determine that direction of opening, nozzle threading and operating nut and cap dimensions are correct.

2. The hydrant interior shall be thoroughly cleaned.

3. The hydrant shall be opened and closed as many times as necessary to determine that all parts are in proper working order, valves are seating properly and the drain valve is operating freely.

4. Hydrants shall be set plumb with the pumper outlet facing the street or curb. Ensure that a minimum of 4 feet of cover is provided for the lateral line, and the nozzles are a minimum of 18 inches above finished grade. Each hydrant shall be set on a concrete foundation at least 18 inches by 18-inches and 6 inches thick. Each hydrant shall be blocked against the end of the trench with a concrete thrust block. The hydrant shall be mechanically restrained from the tee at the main to the hydrant in addition to the thrust block.

   Each hydrant shall have drain holes with a minimum 18-inch-thick layer of 1-1/2-inch (minimum) washed rock beneath them. A sheet of 8-mil polyethylene shall be placed over the washed rock to prevent dirt from filling the rock. All hydrants shall stand plumb and shall be connected to the street main by a minimum 6-inch lateral line. The fire hydrant base shall be adjusted to not more than 3 inches nor less than 2 inches above the approved finished grade. The maximum allowable height of extensions on hydrants is 12 inches. No hydrant lateral shall be installed any deeper than 6 feet from the top of the approved finished grade.

   Hydrant gate valves shall have a restrained connection directly to the tee at the main. In areas where the hydrant bottom is installed below ground water, the drain shall be plugged and the hydrant marked with a metal tag to indicate the requirements to pump the hydrant after use. All other requirements shall be as shown on the detail drawing in the plans.

5. Where an existing fire hydrant is shown on the plan to be located directly on top of the existing water main, it is assumed the existing fire hydrant has a vertical shoe and was installed without an intermediate valve. Full removal of existing fire hydrant assembly shall be required at these locations. If operable gate valve is located that disproves this assumption of the vertical shoe hydrant, then the Contractor shall replace the fire hydrant and any associated pipe required.

6. Where an existing fire hydrant is shown on the plan to be located off the existing water line and connected via service line, Contractor shall remove and replace existing fire hydrant and housing with new 6” fire hydrant. Full removal of the existing fire hydrant assembly is not required, except when there is no immediate valve to shut off water service to the existing fire hydrant.

7. Where a full removal of the existing fire hydrant assembly is required, the existing water main shall be taken out of service and drained to allow removal. Existing fire hydrant assembly shall be removed to the existing water line at the existing 10”x6” tee.

(h) *Taps*. The size of tap and the tapping method for a given type and size of water line shall be as follows:

Type of Pipe and Size of Tap (Inches)

SIZE OF PIPE (inches)	**DUCTILE IRON**			
	3/4"	**1"**	**1-1/2"**	**2"**
3"	NO	NO	NO	NO
4"	S	S	NO	NO
6"	DT	S/DT	S	S
8"	DT	DT	S	S
10"	DT	DT	S	S

S -- Tapping saddle required. All saddles shall have the AWWA taper on its threads.
DT -- Direct tap permitted.
NO -- No tap permitted with or without a saddle. A tee connection may be permitted if specifically authorized by the Engineer.
S/DT -- Either a tapping saddle or a direct tap may be permitted depending on the situation.

All existing AC water lines shall be tapped using a saddle.

This work also includes wet tapping the existing 10” water main, under live service conditions, and connecting the new C900 main.

All taps into the water main shall be at an angle of not more than 45 degrees from the horizontal, and corporation stops shall be installed.

Taps shall not be made on a water main without prior approval from the Engineer, or at the Engineer’s preference, until the Engineer has performed and the main has passed the pressure tests and clear water tests and a "Release For Service" letter has been issued by the Engineer. Care shall be taken to properly install water service lines so that a minimum of 12 inches of slack is in the service line at the main to protect against pull-out. Tapping mains may require digging out bedding material and cutting or removing part of the corrosion protective wrapping. After the taps are made, the wrap shall be repaired or replaced by the contractor to protect both the service line and the main.

Service taps shall have a minimum separation of 24 inches and be no closer than 24 inches to a main line joint. Curb valves shall be placed as close to the ROW line as possible.

For the purpose of estimating quantities, conservatively one service connection was assumed per house, building or business; however based on past experience, there will likely be some combined connections for some buildings.

The Contractor is notified that private property owners may be interested in replacing water and sewer service line connections on their respective private property, and may approach Contractor to bid on and perform said work. Any such work shall be contracted directly with each private property owner, and is not part of this subject contract. The Contractor’s election to take on such work with private property owners shall not relieve them of their contractual responsibility to meet the schedule requirements of this subject contract. Due to the level of interest expressed by private property owners prior to advertising this project, the Engineer may request that the selected Contractor, after execution of the contract and in cooperation with the City, engage in discussions with a collective group of private property owners to optimize pricing and execution of work.

(i) *Encasements.*

1. Provide concrete encasement where indicated on the Plans or required by these Specifications.

2. Sewer line crossings.

   A. Where water mains cross sanitary sewer lines and storm sewer lines, see Sections 603 and 619 for construction requirements.

   B. Provide suitable backfill or other structural protection to preclude settling or failure of higher pipe.

METHOD OF MEASUREMENT

Subsection 619.04 shall include the following:

Wet tapping of the water line will be full compensation for work completed, and accepted. This includes all labor and equipment necessary to excavate, attach the sleave and valve, and tap existing water lines in service, for the connection of the new PVC C900 main to the existing 10" ductile iron main.

Water services will be measured by the actual number of services installed complete in place and accepted to any residence, business, or other service necessary for completion of the work.

Connections of the new 4" main to the existing 4" main will not be measured separately for payment. Include all costs for the connection in the price of the 4 inch PVC Pipe.

BASIS OF PAYMENT

Subsection 619.05 shall include the following:

Pay Item	**Pay Unit**
Water Service (1.5 inch or smaller)	Each
Water Service (2 inch)	Each
Water Service (4 inch)	Each
Wet Tap	Each
4 Inch PVC Pipe (C900)	Linear Foot
6 Inch PVC Pipe (C900)	Linear Foot
8 Inch PVC Pipe (C900)	Linear Foot
4 Inch Gate Valve & Box	Each
8 Inch Gate Valve & Box	Each
6 Inch Fire Hydrant Assembly A	Each
6 Inch Fire Hydrant Assembly B	Each

Payment for Water Service (1.5 inch or smaller) shall be full compensation for all necessary labor, equipment, and materials necessary for the connection of the proposed service lines to existing service lines. Water Service (each) shall include payment for all sizes of existing service connections, and no additional compensation will be made for any sizes 1.5" or smaller encountered in the field. Payment for Water Service (2 inch) and (4 inch) shall be full compensation for all necessary labor, equipment, and materials necessary for the connection of the proposed service lines to existing service lines. Limits of construction for Water Service shall be from the water main, including connection at the water main, to the right-of-way at the point of connection to the service line. No separate payment will be made for saddles, sleeves, tapping devices, pipe, corporation valves, curb valves, or valve boxes but shall be included in the cost of the service.

Payment for 6 Inch Fire Hydrant (Assembly A) shall be full compensation for all labor, equipment, and materials, necessary to excavate and complete installation of the hydrant and connection to the existing 10” main. 6 inch fire hydrants include the 6” hydrant, 6” gate valve & box, all required 6” ductile iron pipe, and all related appurtenances.

Payment for 6 Inch Fire Hydrant (Assembly B) shall be full compensation for all labor, equipment, and materials, necessary for the complete installation of the hydrant and connection to the new C900 main. 6 inch fire hydrants include the 6” hydrant, 6” gate valve & box, all required 6” pipe, and all related appurtenances.

Blow-offs, fittings, bends, tee’s, thrust blocks and valve boxes required as part of the water line construction shall not be measured and paid for separately, but shall be included in the work.

Underground Tracer Wire placed along mains as part of the water line construction will not be measured and paid for separately, but shall be included in the of the cost pipe.

Temporary water services of residences and businesses during construction shall not be paid for separately but shall be included in the work.

Any encasement of the water line, where indicated in the plans, shall be paid for as Item 601, Concrete Class B (Miscellaneous).

REVISION OF SECTION 620
FIELD FACILITIES

Section 620 of the Standard Specifications is hereby revised for this project as follows:

DESCRIPTION

620.01 shall include the following:

The Contractor shall be responsible for identifying a field office location acceptable to the Engineer, and adequate staging areas. The City does not have public rights of way available for these uses. In addition to their own field office needs, the Contractor shall provide adequate field office space for the Engineer and three inspectors/testers. The field office provided (may be an office trailer or dedicated, rented office space in Idaho Springs) shall meet, at a minimum, the space and equipment requirements of a Field Office Class 2 per Section 620 of the Standard Specifications and Standard Drawing M-620-11.

BASIS OF PAYMENT

Payment for the work described as Field Office will be measured by the each.

Payment will be made under:

Pay Item	**Pay Unit**
Field Office (Class 2)	Each

Maintenance, repair, or relocation of Field Office shall not be measured and paid for separately, but shall be included in the work.

REVISION OF SECTION 622
TRASH RECEPTACLE

Section 622 of the Standard Special Provisions is hereby revised for this project as follows:

DESCRIPTION

622.20 shall be deleted and replace with the following:

This work consist of providing temporary trash service for City of Idaho Springs Residents within the project limits whose regular trash service is interrupted by the construction.

Provide 4 cubic yard dumpster, 2 for Central Miner St and 1 for Soda Creek Road. Move dumpsters as necessary to provide coverage. Dump them at least weekly or as necessary to accommodate the volume of trash placed in them.

METHOD OF MEASUREMENT

Trash Receptacle will be paid by the number of loads, verified by landfill receipt tickets, hauled to the landfill and dumped

BASIS OF PAYMENT

Payment will be made under:

Pay Item	**Pay Unit**
Trash Receptable	Each

Providing, moving, and emptying dumpsters will not be paid separately, but shall be included in the work.

REVISION OF SECTION 625
CONSTRUCTION SURVEYING

Section 625 of the Standard Specifications is hereby revised for this project as follows:

DESCRIPTION

Subsection 625.01 shall include the following:

The contractor is responsible for coordinating survey needs and assisting the utility companies with relocation survey requirements including, but not limited to, light pole foundations, pedestal splice boxes, manholes, curb and grade stakes, and others as required by the Engineer.

The Contractor shall also perform Construction Surveying (Hourly) as required by the Engineer. This item will not be used for work as defined in Item 625 Construction Surveying; the intent is to compensate the Contractor for plan revisions or work to be done due to inconsistencies or errors on the Plans that could not have been reasonably detected by the Contractor.

METHOD OF MEASUREMENT

Subsection 625.12 shall include the following:

The method of measurement for the work described as Construction Surveying shall be measured on a lump sum basis.

The number of hours paid will be the actual crew time as determined by the Engineer. Office support hours for calculations and other associated work will be paid at one half-hour of crew time per one hour of office work as determined by the Engineer.

BASIS OF PAYMENT

In Subsection 625.13, delete the second paragraph and replace with the following:

Payment for the work described as Construction Surveying shall be paid as a lump sum and will be full compensation for the work necessary to complete the work. The payment will be made when the work is complete.

Payment will be made under:

Pay Item	**Pay Unit**
Construction Surveying	Lump Sum
Construction Surveying	Hour

Items included in the plans shall include all survey work required to construct the project and will also include resetting of disturbed survey control monuments if disturbed during the execution and construction of the project. These resets will not be measured and paid for separately but shall be included in the cost of Construction Surveying Lump Sum.

REVISION OF SECTION 626
PUBLIC INFORMATION SERVICES

Section 626 of the Standard Specifications is hereby revised for this project as follows:

DESCRIPTION

Subsection 626.01 shall include the following:

The Contractor shall provide the following public information services on an ongoing basis throughout the duration of the project:

The Contractor's Project Manager (PM) shall provide a brief weekly verbal update to the Idaho Springs Mayor (in person or by phone).

At the preconstruction conference the Contractor shall designate a Public Information Manager (PIM) for the project. The PIM shall be available on every working day, on call at all times, and available upon the Engineer's request at other than normal working hours. The PIM shall maintain communications with the Engineer and affected businesses, and provide information on a regular basis to private individuals, local news media, local organizations interested in the project, and persons on the attached list.

The Contractor shall establish a local public information office equipped with a telephone and an answering machine. The public information office may be located within the Contractor's regular office provided that the telephone line is a local call line. A cellular phone line is acceptable. The answering machine shall provide an updated message each week concerning the forthcoming activities on the project and shall give the public information office hours and allow the recording of a message from the caller. The PIM shall check the answering machine at least twice a day. The PIM shall respond to questions concerning project activities and schedules, participate in and document meetings held with affected individuals, and maintain ongoing communication with businesses directly impacted by construction.

The PIM shall coordinate Contractor work activities with the Engineer and each week shall place upcoming two week work schedule on the public access channel for Idaho Springs. Coordination shall take place through the Engineer.

The PIM shall provide the following to the Engineer:

i. Press releases at major project milestones (begin and end of work in each season, begin and end of work for each zone, begin of any work that has major impact to traffic not described above)

ii. A weekly construction update to be posted on project Web site

iii. Develop and maintain a list of email addresses and send out weekly updates (intended to be same info as weekly Web site update)

iv. Provide project updates (no less frequently than weekly) on all major social media sites

The PIM shall prepare and distribute a flier to the residents and businesses directly adjacent to the project limits prior to beginning construction and once each month thereafter. The flier shall be printed on orange paper and shall discuss the project's ongoing work, the anticipated completion date and the schedule for the forthcoming month. The flier shall provide the name of the Contractor's contact person and the telephone number and office hours of the public information office. Fliers, and media releases, shall be provided to the Engineer and to the people on the attached list for review 48 hours prior to distribution.

The Contractor shall erect construction traffic signs with the dates the Contractor expects to initiate and complete

construction and with the Contractor's public information office phone number at each major approach to the project. These signs shall conform to the requirements of Section 630 and shall be erected as directed by the Engineer in accordance with the plans. These signs shall be erected at least one week prior to the beginning of construction.

The Contractor shall maintain a logbook of citizen and business contacts, including names, addresses, emails, phone numbers, and subsequent action taken during construction and shall provide the Engineer a copy each week. All inquiries and complaints shall be followed up with either a return phone call, or a meeting, as warranted.

BASIS OF PAYMENT

Subsection 626.02 shall include the following:

The Engineer will monitor the PIM and all public information services. When the Contractor 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:

When 5% of the original Contract amount is earned, 25% of the amount bid for this item will be paid.

When 10% of the original Contract amount is earned, 40% of the amount bid for this item, less all previous payments, will be paid.

When 25% of the original Contract amount is earned, 50% of the amount bid for this item, less all previous payments, will be paid.

When 75% of the original Contract amount is earned, 75% of the amount bid for this item, less all previous payments, will be paid.

When 100% of the original Contract amount is earned, 100% of the amount bid for this item, less all previous payments, will be paid.

For the purpose of this Specification, the term "original Contract amount" as used above, shall mean the amount bid for the construction items on this Contract, not including the amounts bid for Public Information Services and Mobilization.

Payment for Public Information Services will be full compensation for all fliers, public information office, telephone lines, and all other labor and materials required to complete the item, except signs. Signs will be measured and paid for in accordance with Section 630.

Payment will be made under:

Pay Item	**Pay Unit**
Public Information Services	Lump Sum

Public Information Services Contact List

City of Idaho Springs
Fire Department
Phone: 303-567-2078

Police Department
Phone: 303-567-4291

Public Works Department
John Bordoni, Public Works Superintendant
Phone: 303-567-2400

City Hall
Andy Marsh, City Administrator
Phone: 303-567-4421

Colorado State Patrol
Phone: 303-567-4201

Colorado Department of Transportation
Project Engineer: Steve Harelson
Phone: 720-497-6913

Colorado Department of Transportation, Public Information Office
Emily Wolfong
4201 E. Arkansas, Room 277
Denver, CO 80222
Phone: 303-512-5955
Fax: 303-757-9153

Clear Creek County
Beth Luther
Phone: 303-679-2312
Fax: 303-679-2440
Email: bluther@co.clear-creek.co.us

Colorado Department of Public Health and Environment
Mary Boardman
Phone: 303-692-3413

HDR Engineering, Inc. (Program Manager)
Tony Galardi, PE, Program Manager
1670 Broadway, Suite 3400
Denver, CO 80202-4824
Office Phone: 303-829-0859

Bruce Tonilas, PE, Resident Engineer
1670 Broadway, Suite 3400
Denver, CO 80202-4824
Office Phone: 303-318-6350

Tony Galardi, PE - Project Engineer
1670 Broadway, Suite 3400
Denver, CO 80202-4824
Office Phone: 303-829-0859

REVISION OF SECTION 630
CONSTRUCTION ZONE TRAFFIC CONTROL

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

CONSTRUCTION REQUIREMENTS

Subsection 630.10, first sentence of the first paragraph, shall be modified as follows:

The Contractor shall control traffic in accordance with the Suggested Construction Phasing plans, as shown in the Contract and described in the Traffic Control Plan – General section.

Subsection 630.10 shall be modified to include the following:

The Contractor must maintain a minimum lane width of 10' and a minimum 1' shy from the face of construction traffic control devices.

METHOD OF MEASUREMENT

Subsection 630.15, the first four paragraphs, shall be deleted and replaced with the following:

All roadway maintenance and construction traffic control devices required including, but not limited to: Electronic Advance Warning Signs (portable variable message boards number and use to be as directed by the Engineer), Temporary Signal Systems, Temporary Channelizing Devices, Concrete Barrier, Temporary Striping, Temporary and Advance Construction Signs, pilot car operations, if deemed necessary to safely to perform the work, shall not be measured and paid for separately but shall be included as part of the Lump Sum pay item listed in the Contract. .

Traffic Control Management will include Traffic Control Inspection, development of the traffic management plan as well as meeting the requirements in subsections 630.10 and 630.11.

BASIS OF PAYMENT

Subsection 630.16 shall be deleted and replaced with the following:

All construction traffic control devices not listed above or in the standard specifications shall be paid for under Lump Sum. Payment will be made under:

Pay Item	**Pay Unit**
Traffic Control (Special)	Lump Sum
Traffic Control Management	Day

REVISION OF SECTION 712
MISCELLANEOUS

Section 712 of the Standard Specifications shall be revised for this project as follows:

Delete subsection 712.13 and replace with the following:

PVC pipe and all fittings for sanitary sewers shall conform to the following:

Plastic Pipe. All pipe materials and fittings shall meet the minimum requirements of ASTM D-3034, SDR-35, latest revision. Pipe shall be subjected to drop-impact tests in accordance with ASTM D-2444.

(Note: SDR 41 is not acceptable). Line fittings shall be in accordance with ASTM D3034 A, paragraph 6.1 "Elastometric Joint Gaskets." Cemented line joints shall not be used.

The pipe shall have bell and spigot joints with gasketed joint. The spigot end shall be marked so the installer and the inspector can determine when the pipe is properly inserted into the bell. The maximum pipe length shall be twenty feet.

Minimum wall thickness shall be:

Pipe Diameter (Inches)	4	6	8	10	12	15	18
Wall Thickness (Inches)	.125	.180	.240	.300	.360	.437	.536

All fittings and accessories shall be as manufactured and furnished by the pipe supplier and have bell and/or spigot configurations compatible with that of the pipe.

Pipe stiffness for all pipe sizes shall be tested in accordance with ASTM D-2412. Joint tightness shall be tested in accordance with ASTM D-3212.

Gaskets. Gaskets shall comply in all respects with physical requirements specified in ASTM F477. It shall consist of a properly vulcanized high grade elastomeric compound. The basic polymer shall be natural rubber, synthetic elastomer, or a blend of both. The gasket shall be the only element depended upon to make the joint flexible and water-tight.

Lubricant. The lubricant used for assembly shall have no detrimental effect on the gasket or on the pipe.

REVISION OF SECTION 716
WATER LINE MATERIALS

Section 716 of the Standard Specifications is hereby revised for this project as follow:

Subsection 716.05 Plastic Pipe add the following:

PVC (C900). PVC (C900) shall be manufactured according to AWWA Standard C-900, Class 200, gasketed pipe with bell and spigot joints with AWWA C111, rubber gaskets.

Add subsection 716.06 as follows:

(a) *Ductile Iron Pipe (DIP)*. All ductile iron pipe shall be manufactured in accordance with AWWA Standard C-151.

Pipe furnished under this specification shall conform to the following thickness classes:

Class 50 (6”)
Class 51 (4”, 20" and 24" diameter)
(>24” Class as determined by the Engineer)

Class 52 (8” and 10”)

The joint type shall be "push-on, single-gasket" type conforming with applicable requirements of AWWA Standard C-111. Joint types other than "push-on, single-gasket" are acceptable only if specifically approved by the Engineer in writing.

Pipe shall have normal laying length of either 18 feet or 20 feet. Random lengths are not acceptable.

Iron used in the manufacture of pipe shall have 60/42/10 physicals in accordance with AWWA C-151.

Pipe shall have standard thickness cement mortar linings in accordance with AWWA Standard C-104.

The weight, class or nominal thickness, and casting period shall be shown on each pipe. The manufacturer's mark, the year in which the pipe was produced, and the letters "DI" or "Ductile" shall be cast or stamped on the pipe.

(b) *Fittings*. All fittings shall be manufactured in accordance with the following AWWA Standards:

-- C-104, "Cement Mortar Lining for Cast-Iron and Ductile Iron Pipe and Fittings for Water"

-- C-153, "Gray Iron and Ductile Iron Fittings"

-- C-111, "Rubber Gasket Joints for Cast-Iron and Ductile Iron Pressure for Pipe and Fittings"

The following are additional requirements or exceptions to the standards mentioned above:

All fittings shall be furnished with a cement mortar lining of standard thickness as defined in the referenced specifications and given a seal coat of bituminous material. All fittings shall be furnished with mechanical joint, or flanged ends conforming to the referenced specifications and, in addition, the tee-head mechanical joint bolts and hexagon nuts shall be fabricated from a high strength, low alloy steel known in the industry as "Cor-Ten" or approved equal. Mechanical joint anchoring fittings (swivel) as approved by the Engineer, in writing, may also be used.

All fittings shall be 350 PSI pressure rating and shall conform to the dimensions and weights shown in the tables of the referenced specifications. All fittings shall be made from gray iron or ductile iron. The manufacturer shall prepare a certified statement that the inspection and all of the specified tests have been made and the results thereof comply with the requirements of the applicable standard(s) herein specified. A copy of the certification shall be sent to the Engineer upon request.

Delete subsection 716.07 and replace with the following:

(a) *Valves*

1. *General*. All valves shall open left (counterclockwise). All valves shall have a 2-inch-square operating nut. The extension stem shall be mechanically connected to the operating nut. All valves shall have a mechanical joint end and shall be delivered complete with bolts, glands and rubber gaskets.

   End connections shall be furnished with all necessary joint materials and shall have full opening flow way of equal diameter to the nominal size of the connecting pipe.

2. *Gate Valves*. Gate valves shall be iron body, resilient-seated, gate valves with non-rising bronze stems with design, construction, and pressure rating conforming to AWWA Specifications C-509 or C515, with modifications specified herein. Stem seals shall be double "O" ring seals designed so that the seal above the stem collar can be replaced with the valve under pressure and in full open position.

   All ferrous internal and external surfaces of the valves shall be coated to a minimum thickness of four mils. The coating shall be a two-part thermosetting epoxy suitable for field overcoating and for touch-up with the same coating material without special surface preparation. The supplier shall furnish detailed performance tests of adhesion, hardness and abrasion resistance of the furnished coatings when requested by the Engineer. The coating shall have a successful record of performance in valves, pipe or other fittings for a minimum of ten years. The resilient seat gate valves shall have external break-off capabilities for over-torquing and positive stop to prevent over compression.

   All bolts and nuts used in conjunction with valves shall be stainless steel, "Cor-Ten," or approved equal. All gate valves shall be installed with a valve box meeting the following specifications:

   Materials:

   Valve box parts shall be made of gray cast iron, ASTM A 48, Class 35B

   Use of an aluminum alloy as a casting material is not acceptable.

   Approved Patterns:

   Valve boxes shall be the three-piece adjustable screw type. The top section shall be 16 inches long.

   The following pattern is acceptable.

   Tyler screw-type 6 inch cast iron valve box assembly series 6860 with No. 160 oval base.

   Star Pipe Model No. VB-0006 Series

   Castings Inc. CI. 160B Oval Base

East Jordan Iron Works 8J60 Series

East Jordon Iron Works 6800 Series drop lid

Tyler/Union 6860 Series

Bingham and Taylor Corp Figure 4906

Approved equivalent

Add subsection 716.08 as follows:

(a) *Fire Hydrants*. Hydrants will be Mueller Super Centurion 250 model A-423 with the following options:

-- *Bronze to bronze seating.*
-- Oil cup reservoir.
-- Bronze "safety sleeve" stem coupling.
-- Bronze operating nut.
-- Epoxy-coated upper and lower washer assembly.

Hydrants shall have a 5-1/4-inch main valve opening with a 6-inch mechanical joint end. Each hydrant shall be equipped with one 4-1/2-inch pumper nozzle and two 2-1/2-inch hose nozzles with national standard threads.

Fire hydrants shall open left (counterclockwise). Fire hydrants shall be installed so that the traffic flange is at or within 2 inches above finished grade. Fire hydrants shall be designed for 5-foot pipe bury. Hydrants shall be thoroughly cleaned and then painted with a prime coat of synthetic red primer Type IV-TTP-86f followed by one shop coat of fire engine red, Rust-oleum industrial enamel, 7407 masstone tintbase, #1210 or approved equal. Care shall be taken when handling hydrants to protect the paint. Whenever the paint is chipped or scratched, the contractor shall repaint the hydrant. A traffic break-away feature shall be incorporated into the barrel of the hydrant at the ground line. The operating nut shall be National Standard pentagon measuring 1-1/2 inches from point to opposite flat. Nozzle covers shall have the same size and shape nut as the operating nut and shall be attached by chain to the hydrant body.

Add subsection 716.09 as follows:

(a) *Service Connections*

1. *Pipe*. Acceptable materials for a service line are seamless copper tube, ductile iron pipe or Kitec Composite Pressure Pipe. All service pipes shall conform to one of the following specifications. Plastic pipe is not an acceptable service pipe material.

   A. Seamless copper tube designated as "Type K" (soft) in the industry shall be used for service lines larger than 3/4-inch through 3 inches.

   B. Kitec composite pressure pipe shall be used for all ¾” water services.

   C. Ductile iron pipe conforming to subs 716.07 shall be used for service lines larger than 4 inches.

2. Kitec Water Service Connector System Specification.

3. Saddles. Saddles shall be CC thread in accordance with AWWA C-800, Install Mueller S-13000 Brass Outside Diameter Control for C900. Install Mueller BR2B Double strap bronze saddles for ductile iron pipe.

A. *All Components*. Components for the piping system shall be approved for use by the piping system manufacturer. This shall include tubing, fittings, valves, manifolds, fire stopping caulk, and other auxiliary items required for a complete installation as outlined by IPEX Inc. (the manufacturer).

B. *Kitec PE-AL-PE Water Service Line Piping.*

- Kitec Composite Pressure Pipe for water service line only, PE-AL-PE (Dark Blue), shall be manufactured in accordance with and third party certified to ASTM F1282-98a.
- PE-AL-PE shall be third party certified to the requirements of NSF-14.
- PE-AL-PE shall carry IAPMO Classified Marking Certificates and shall be rated to a minimum of 200 psi at 73°F, and 160 psi at 140°F.
- All residential water service pipe shall have minimal nominal ID's of ¾".

C. *Kitec Fitting.* Municipal Water Service Line Applications

- Kitec fittings and universal adapters for municipal water service lines shall be manufactured from municipal red brass in accordance with the requirements of AWWA C800.

D. *Installation.*

- Pipe and fittings shall be installed according to the requirements of the manufacturer's installation guide, which shall be adopted as part of this specification.
- Pipe shall not be bent on a tighter radius than 5 times its diameter.
- If the pipe becomes damaged during installation, the damaged pipe must be cut out and repaired with an appropriate coupling.
- If the pipe becomes out of round from bending the section may be rerounded.

4. Curb Stops

A. Curb stops shall be Mueller Company Mark II Oriseal, Jones, Ford ball valves McDonald ball valves, or approved equal. 1-1/2 inch and 2 inch curb stops shall have compression fittings.

B. Curb Stop Boxes shall be Tyler, 6870 series, 5-foot extension, size 145R with 4 ¼" shaft and bolt down lid.

5. *Tapping Sleeve and Valve*. Tapping valves shall be resilient seat, cast iron body, fully bronze mounted with non-rising stem. Only epoxy-coated steel tapping sleeves or stainless steel sleeves shall be used and shall be in conformance with the following specifications.

A. *Material.* All steel plate used in fabrication of the tapping sleeves shall conform to ASTM A 36 or A 285, Grade C.

B. *Flanges.* Flanges shall be fabricated from steel plate, and all dimensions shall conform to AWWA C207, Class D. Flanges shall be machined to a flat surface with a serrated finish in accordance with AWWA C207. In addition, the machined face shall also be recessed for tapping valves in accordance with the MSS SP-60.

C. *Gaskets.* Gaskets shall be compounded from new materials, and the shape of cross-section of gasket shall provide adequate seal for the design pressure. Gaskets shall be shop glued to the groove provided in the body section.

D. *Fasteners.* Bolts and hex nuts shall be Stainless Steel, Usalloy, Dresserloy, Cor-Ten, ductile iron Durabolt or an approved equal for corrosion control.

E. *Testing Outlet.* A 3/4 inch NPT by welded coupling shall be attached to the outlet nozzle of each tapping sleeve assembly complete with a 3/4 inch square head pipe plug.

F. *Painting.* All surfaces of the sleeve shall be clean, dry and free from grease and dirt before painting. All surfaces of tapping sleeve except face of flange, bolts and nuts, shall be given a shop coat of manufacturer's standard coating. Face of flanges shall be shop coated with a rust preventive compound. Bolts and nuts shall be shipped bare, without paint or protective coating.

G. *Acceptable Manufacturers:*

Fabricated Steel	Stainless Steel
Ford Model FTSS	J.C.M.-Model JCM 432
International Style 228	Power Seal - Model 3490
Romac FTS 420	Cascade Style CST
Smith-Blair Model 622	J.C.M. Model 412

6. *Corporation Stops.* All corporation stops and threaded brass fittings shall be in accordance with ASTM-B62-63 (common trade name 85-5-5-5). All threads shall conform to AWWA C-800-66. All corporation stops shall be tested at the factory and shall meet the following minimum physical requirements:

Tensile strength	30,000 PSI minimum
Yield Strength	14,000 PSI minimum
Enlongation in 2 inches	20 percent minimum

Acceptable corporation stops are:

¾”	Ford: F10003G McDonald: 6100Q Mueller: H-15008 Jones: J3401SG	McDonald – Q series compression end
1”	Ford: F10004G McDonald: 6100Q Mueller: H-15008 Jones: J3401SG	Mueller – 110 compression end
1-1/2”	Ford: FB0006G McDonald: 6100Q Mueller: H-15013 Jones: J1937SG	Ford – Quick Joint compression end

2” Ford: FB0007G
McDonald: 6100Q
Mueller: H-15013
Jones: J1937SG

Add subsection 716.10 as follows:

(a) *Encasements*. All concrete shall be a minimum of Class B and shall conform to Section 601 Structural Concrete.

1. All concrete encasements shall be a minimum of 6 inches thick from outside of pipe to outside of encasement.

2. *Polyethylene Wrap*. Polyethylene encasement material shall be a minimum of 8 mils thick and shall be Scotchrap No. 50 (polyvinyl), or approved equal. All polyethylene encasement material shall be manufactured in accordance with ANSI/AWWA Standard C-105/A21.5. The raw materials used to manufacture polyethylene film shall be Type I, Class A, Grade E-1 in accordance with ASTM Standard Designations D-1250.

Add subsection 716.11 as follows:

(a) *Restraining System*.

1. *Megalug*. Mechanical joint restraint can be accomplished by the use of a Megalug restraining system, Uniflange joint restraints, or approved equal. Glands shall be manufactured of ductile iron conforming to ASTM A 536. Dimensions of the gland shall be such that it can be used with the standardized mechanical joint bell and tee-head bolts conforming to ANSI/AWWA A21.11 and ANSI/AWWA C153/A21.53, latest revision. Twist-off nuts, sized the same as the tee-head bolts, shall be used to insure that the proper torque is applied to the bolts. In no case shall the twist-off bolts be torqued beyond 90 ft. lbs. The mechanical joint restraint device shall have a working pressure of at least 250 PSI, with a minimum safety factor of 2:1. Use Megalug Series PV2000 for PVC C900 or and approved equal. Use Megalug Series 1100 for ductile iron or approved equal.

FORCE ACCOUNT ITEMS
DESCRIPTION

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

BASIS OF PAYMENT

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

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

Force Account Item		Unit	Estimated Amount
F/A	Minor Contract Revisions	F.A.	$TBD
F/A	Dewatering	F.A.	$TBD
F/A	Voids Repair	F.A.	$TBD
F/A	Environmental Health and Safety Management	F.A.	$TBD
F/A	Asphalt Price Adjustment	F.A.	$TBD

Force Account Descriptions

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

F/A Dewatering – This work is described in Project Special Provision – Dewatering. This force account item will only be used for hauling groundwater if discharge on site is not allowed by permit.

F/A Voids Repair – This work consists of the backfill of voids encountered under the pavement that may be undermining the road or surrounding surfaces (i.e. sidewalk or walls).

F/A Environmental Health and Safety Management - This work consists of the work included in project Special Provision 250. This will include hazardous material management of items discovered during the excavation.

F/A Asphalt Price Adjustment - This work consists of the work included in project Special Provision 105.

SPECIAL CONSTRUCTION REQUIREMENTS

1. The Contractor shall prepare and submit a video of existing conditions of the entire project site, after the Notice of Award and prior to beginning work. The video shall be submitted to the Engineer for review 14 days prior to mobilization onto the site. The video will be reviewed by the Engineer for completeness, and a response regarding the video's sufficiency will be provided to the Contractor within 10 days of receipt of the video. If supplemental videos are necessary to properly document existing conditions, such additional video shall be taken by the Contractor, at no additional expense, and submitted to the Engineer for review. The Contractor may mobilize onto the site upon the Engineer's acceptance of the existing conditions video(s). Two copies of the video shall be submitted on either CD's or jump drives. The Contractor shall coordinate the file format of such videos with the Engineer prior to filming. The video shall show existing conditions down the centerline of the road on both the north and south properties adjacent to the road, any storage areas the Contractor is allowed to use on City-owned property, and all areas the Contractor anticipates disturbing during construction.

2. GPS and take Photos of all gate valves, manholes, curb valves, cleanouts, etc.. prior to placing the first lift of Asphalt in order keep records of all locations that they are to be raised to the finished grade.

3. The Owner will perform Quality Assurance Inspection and Testing. The Contractor shall perform the following Inspection Scheduling and Quality Control Responsibilities:

Inspection Scheduling

The Contractor shall perform the following:

1) A daily proposed work schedule shall be developed by the Contractor and their sub-contractors which shall communicate all work being performed on the project.
2) The work schedule shall be written onto dry erase boards in a field facility easily accessible to all project personnel during construction.
3) The dry erase boards shall be divided into the following columns:
   i. Location and brief description of work
   ii. Tests and inspections required and time of inspection or test (night work is also detailed here)
   iii. Look-ahead information
4) All work for the next day and the following night shall be entered into the board by 1:00 p.m. each day.
5) Weekend or Holiday work that is required shall be entered into the board by Thursday by 1:00 p.m.
6) The items on the board shall be entered into a spreadsheet and sent to a standing email list every afternoon by 3:30 p.m. Work assignments for owner construction management staff will be made by the Engineer based on this spreadsheet.
7) Every attempt will be made to accommodate work which appears on the schedule and occurs close to the scheduled time. Work which does not appear on the spreadsheet or is significantly delayed shall be rescheduled. All time required for delayed or rescheduled work shall not be the basis for any claim for a time extension or monetary adjustment.

Contractor's Quality Control Responsibilities

The Contractor shall perform a Quality Control inspection before the owner's Quality Assurance inspection. The Contractor's quality control inspection results shall be documented on a signed Inspection Request Form which shall be given to the owner's inspector before the quality assurance inspection may begin.

The owner's inspector may place a green tag on the work if it is found to be acceptable and a red tag if there are issues which must be addressed before subsequent work can be performed (e.g., concrete placement). The Contractor shall reschedule any Red Tagged work for a follow-up inspection once it has been corrected.

4. All costs associated with the requirements of this Special Construction Requirements special provision will not be paid for separately, but shall be include in the cost of the work.

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

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

   (1) Subsection 104.04 and Section 630 of the specifications.

   (2) Revised Standard Plan S-630-1, Traffic Controls for Highway Construction, and Standard Plan S-630-2, Barricades, Drums, Concrete Barriers (Temp.) and Vertical Panels.

   (3) Signing Plans

   (4) Manual on Uniform Traffic Control Devices (MUTCD).

TRAFFIC CONTROL PLAN - GENERAL

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

Soda Creek Road Requirements:

- One lane of traffic must be maintained at all times during working hours and two lanes during non-working hours with temporary stop lights as required to allow two way vehicle movement. Temporary signal systems will not be measured separately for payment.
- Do not allow traffic to back up onto Miner St past Riverside Dr, to the west, or the Idaho Springs Visitor Center to the East at all times.
- The maximum allowable delay to public traffic is 15 minutes.
- Emergency Access must be maintained to the Indian Hot Springs, Montane Rd, and Pine Slope Road at all times.
- No road closure or delays are allowed on Saturday or Sunday without prior approval from the Engineer.
- The main parking for the Hot Springs, on the West Side of Soda Creek Road, may not be used for a staging area or turnaround for construction vehicles without written approval from the owner. Any damaged cause to private parking area must be repaired to the owners satisfaction at no cost to the City of Idaho Springs
- One lane operations, maintained through non-working hours, must have an approved MHT. Temporary traffic lights will not be measured separately for payment.
- The contractor must provide at least 48 hour notice to Businesses or Homeowners if the construction work will impact ingress/egress to their property.
- Method of Handling Traffic (MHTs) must be approved by the Engineer prior to beginning any work.
- Coordinate and allow access for bus stop pickups and trash truck collections.

Central Miner St. Requirements:

- Access must be maintained to Soda Creek Road at all times.
- The maximum allowable delay to the public is 15 minutes
- Phased Closures on Miner St will be allowed according to the following restrictions.

        - Central Miner St. May be closed to public use during working hours between the Visitor Center driveway and 20th St, but not concurrently with a closure from 20th to Soda Creek Road.
        - The Bridge over Clear Creek can't be closed concurrently with a closure between Soda Creek Road and 20th avenue.
    - Allow residents to access parking in the County Lot south of 20th at all times unless otherwise approved by the Engineer.
    - The building on the north side of Miner St from 51+00 to 52+50 is a senior center and extra coordination will be required to maintain access for residents with disabilities. This may include completing the work in the parking area, and valley pan, ½ at a time or providing assistance to certain residents.
    - Provide at least 48 hours' notice to Businesses or Homeowners if the construction work will impact ingress/egress to their property.
    - Method of Handling Traffic (MHTs) must be developed to provide the appropriate level of detour signage to direct residents to available parking, and to direct the public to Soda Creek Road. All MHT's must be approved by the Engineer prior to beginning any work.
    - Coordinate and allow access for bus stop pickups and trash truck collections.

During the construction of this project, driving surfaces shall be maintained in good usable condition for the traveling public. The contractor may elect to place traffic on paved surfaces, compacted asphalt millings, subgrade or other all-weather surfaces approved by the Engineer. If the traffic is placed on unpaved surfaces, grade the surface to control drainage away from the driving surface. If storm event causes significant damage to the driving surface, immediately repair the driving surface prior to continuing other work items. Maintenance of the work zone will be required on the weekends and all other non-working days. Include the cost of maintenance in the Traffic Control (Special) Pay Item.

Excessive delays. Delays to traffic due to flagging operation are limited to a maximum duration of 15 minutes in a single direction.

The Contractor shall maintain access to existing businesses at all times. In the event that work requires temporary closure of a business access, the Contractor must provide written notice to each affected business owner within 72 hours of the closure and must have an agreed upon duration of the closure that is acceptable to the business owner, the City and the Contractor. This must be documented by the Contractor and made available to the Engineer.

The Contractor shall maintain a minimum lane width of 10' and a minimum 1' from the edge of the travel lane to the face of a traffic control device (temporary concrete barrier, channelizing drum, etc.) at all times.

Except as provided in Section 619 (a), Interruption of Service, all work shall be performed between the hours of 7:00 AM and 6:00 PM Monday thru Friday unless otherwise approved by the Engineer. No work shall be conducted at night or on weekends without the prior approval of the Engineer.

Work shall not occur on Federal Holidays (New Year's Day, MLK Day, Presidents Day, Memorial Day, 4th of July, Labor Day, Columbus Day, Veterans Day, Thanksgiving, the day after Thanksgiving, and Christmas Day). There is the potential for the City to have designated no work days to be determined during the length of contract due to local events. Notice will be provided to the Contractor as early as possible. Contractor shall coordinate with the Engineer when the City requests no-work days.

All utility service connections shall be restored to operation at the end of each work shift unless approved in advance by the Engineer. Alternatively, temporary services shall be installed or other arrangements shall be made that are acceptable to the Engineer.

The Contractor shall be required to submit for approval and update as necessary during construction a General Pedestrian Access Plan. The Contractor shall provide one pedestrian access route at all times during construction. This plan shall clearly identify how residents and business owners will access their respective buildings during construction activities adjacent to the parcel. This plan will be part of the public information services and will allow residents and businesses to prepare for the changed access. The Contractor is the primary point of contact with each property owner/tenant, but if an owner/tenant requests special consideration for access or parking, the Contractor shall notify the Engineer of the request. The Engineer will then coordinate with the City's Public Works Superintendent to assist any resident that believes they need special accommodations for pedestrian or vehicle access, or parking.

During non-work hours of 6:00 PM to 7:00 AM, the Contractor shall leave the work zone in a suitable manner to allow emergency vehicle access to all residences or businesses.

Construction signing may be placed on temporary supports.

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

Workers, Contractors, Suppliers, etc. shall not access the work area by crossing roadways unless proper traffic control or other necessary precautions are provided. Suitable transportation to the work site for personnel whose vehicles are parked off site shall be provided by the Contractor.

The Contractor shall organize the work such that there will be no hazards within the clear zone at the completion of each day's work.

Employee vehicle parking is prohibited outside the work zone. On-street parking shall be for city residents only. Contractor employees shall park in areas approved by the Engineer.

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

Any signs damaged due to the Contractor's operations shall be replaced with new at the Contractor's expense.

The Contractor shall supply portable CB radios or FM radios (5 mile range), as required for traffic and safety control, for the Engineer, TCS, flaggers, Contractor's superintendent, and other personnel as required.

The Contractor shall submit for the Engineer's approval, a detailed plan addressing, at a minimum, the following: what work will be performed; the amount of trench to be opened and how long it will be open; testing of utilities; how impacts to adjacent residents and through traffic will be minimized and mitigated; jobsite safety for workers and public; maintenance conditions; maintenance of traffic; a detailed schedule; and a planned production rate for the purpose of scheduling inspection staff. The Engineer reserves the right to shut down the project, upon written notice to the Contractor, if the Contractor fails to comply with any single condition of the plan. There will not be any separate payment for the associated work plan, pavement design, pavement patching and maintenance, or any other increased costs due to working over winter. All associated costs shall be considered incidental to sanitary sewer and water line pay items.

UTILITIES

Known utilities and contacts within the limits of this project are:

UTILITY/ADDRESS	CONTACT/EMAIL	PHONE
Comcast Cable / AT&T 6850 S. Tucson Way Englewood, CO 80112	Patrick Peck Pat_peck@comcast.com	303-603-5441 720-636-3922 (Cell)
City of Idaho Springs 200 W. Colorado Blvd PO Box 907 Idaho Springs, CO 80452	John Bordoni pw@idahospringsco.com	303-567-0124
CenturyLink 1855 S. Flatiron Ct. Boulder, CO 80301	Robert Davis Robert.Davis@centurylink.com	303-946-0036
Xcel Energy 5460 W. 60th Avenue Arvada, CO 80003 Pike Engineering 555 Zang Street, Suite 250 Lakewood, CO 80228	Preston Gibson Preston.e.gibson@xcelenergy.com Paul Heald – High Pressure Gas Paul.R.Heald@xcelenergy.com Clint Lucatuorto (Pike Engineering) Clinton.w.lucatuorto@xcelenergy.com	303-425-3944 303-571-3285 720-252-9762

The work described in these plans and specifications requires coordination between the Contractor and the utility companies in accordance with subsection 105.10 in conducting their respective operations as necessary to complete the utility work with minimum delay to the project. Also, in accordance with the plans and specifications, and as directed by the Engineer, the Contractor shall keep the utility company(s) advised of any work being done to their facility, so that the utility company(s) can coordinate their inspections for final acceptance of the work with the Engineer.

PART 1 - CONTRACTOR SHALL PERFORM THE WORK LISTED BELOW:

Construct the new pedestrian lighting system, including all conduit, lights, wiring, controls, and electrical connections as shown in the plans and required in Section 613.

Coordinate project construction with performance by the utility owner of each utility work element listed in Part 2 below. Perform preparatory work specified in Part 2 for each utility work element. Provide an accurate construction schedule that includes all utility work elements to the owner of each impacted utility. Provide each utility owner with periodic updates to the schedule. Conduct necessary utility coordination meetings and provide other necessary accommodations as directed by the Engineer. Notify each utility owner in writing, with a copy to the Engineer, prior to the time each utility work element is to be performed by the utility owner. Provide notice, as specified in Part 2, immediately prior to the time the utility work must begin to meet the project schedule. A minimum of two weeks prior notice is required.

Prior to excavating, the Contractor shall positively locate all potential conflicts with existing underground utilities and proposed construction, as determined by the Contractor according to proposed methods and schedule of construction. The Contractor shall modify construction plans to avoid existing underground facilities as needed, and as approved by the Engineer. Please note that UNCC marks only its members' facilities – Other facilities, such as ditches and drainage pipes may exist, and it is the Contractor's responsibility to investigate, locate and avoid such facilities.

The Contractor shall provide written notices to each utility owner, with a copy to the Engineer, immediately prior to each utility work element on the construction schedule that is expected to be coordinated with construction. The Contractor shall allow the number of work days required for each utility work element in the construction schedule.

Work involving changes in, or interference with, utility service shall be done at such times and in such manner that it will cause the least interference with the proper handling and delivery of the utility service to the receiving customers. The Contractor shall notify all parties that will be affected a minimum of 48 hours prior to the time sewer or water service is disconnected or interrupted for work performed by the Contractor or Utility Company. All services so-disconnected, interrupted, or damaged shall be immediately repaired and restored to service. Repair work shall be continuous until the service is restored. No service shall be left inoperative overnight.

When work is being performed in the vicinity of utilities, the Contractor shall take appropriate measures to provide for the protection of the utility.

Should the Contractor desire to have any rearrangement made in any utility facility for his convenience in order to facilitate his construction operations, he shall make whatever arrangements are necessary with the owners of such utility for such rearrangement and bear all expenses in connection therewith.

Due to utility relocation operations that may have occurred after preparation of the plans, attention is directed to the possible existence of underground facilities not known to the City or in a location different from that which is indicated on the plans or in the special provisions. The Contractor shall take reasonable steps to ascertain the exact location of all underground facilities prior to doing work that may damage such facilities or interfere with their service. If the Contractor discovers underground facilities not indicated on the plans or in the special provisions, immediately give the Engineer and the utility owner written notification of the existence of such facilities and coordinate the rearrangement of the facility as provided above.

Coordinate daily operations and provide traffic control for utility work performed by the utility owner within the project limits. However, traffic control for utility work outside of typical project work hours shall be the responsibility of the utility owner.

Provide staking for rights-of-way and utility easements and for proposed storm sewer crossings, with cut depths marked, prior to utility relocation works. This work shall be coordinated with the utility owner.

Perform each utility work element for every utility owner listed in Part 1. Notify each utility owner in advance of any work being done by the Contractor to its facility, so that the utility owner can coordinate its inspections for final acceptance of the work with the Engineer.

All costs incidental to the foregoing requirements shall not be paid for separately, but shall be included in the work. Full compensation for compliance and cooperation, as required by this section, shall be considered to be included in the unit prices paid for Contract items of work and no additional compensation will be allowed.

All Utility Owners:
Contractor shall locate and pothole all potential conflicts with existing buried utility facilities with the proposed construction, as shown on the plans or by field location markings. If a conflict exists, modify proposed construction plans to avoid all existing buried utility facilities as approved by the Engineer. Contractor shall contact utility owners a minimum of 5 days prior to potholing to allow their observation of potholing activities.

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:

City of Idaho Springs:
The Contractor shall be responsible for all work associated with the construction of the proposed sanitary sewer, water lines (hydrants, services, etc.) and storm drain. This work shall include, but not be limited to: removal of abandoned materials; adjustments to water valves, curb stops, and sewer manholes; installation of proposed City of Idaho Springs utilities; installation and protection of temporary services; and protection of existing utilities. The Contractor shall coordinate the work with the City of Idaho Springs Public Works.

The Contractor shall adjust, and modify as applicable, water valve boxes and sanitary and storm sewer manholes up to ¼" to ½" below final grade of the paved surface as shown on the plans.

The Contractor shall coordinate all required inspections with City of Idaho Springs forces.

Xcel Energy:

Coordinate all work activities and allow Xcel access to the work zone. Xcel will replace the existing underground gas main distribution and services throughout the project limits. Xcel will also replace the existing high pressure gas main system throughout the project limits.

Xcel Energy will also set the meter for the new pedestrian lighting system.

PART 2 - UTILITY COMPANIES SHALL PERFORM THE WORK LISTED BELOW:

The Contractor shall provide access and traffic control for any utility work expected to be coordinated with construction, as directed by the City of Idaho Springs or the Engineer. However, traffic control for utility work outside of typical project work hours shall be the responsibility of the utility owner. The utility owner shall prepare and submit to the City of Idaho Springs a Method of Handling Traffic for utility work to be performed outside typical project work hours. The utility owner shall obtain approval of the Method of Handling traffic from the City of Idaho Springs prior to beginning the utility work to be performed outside typical project work hours.

This work will be performed by the utility owners as necessary to avoid conflicts with construction activities. The contractor shall consider the utility work the progress schedule and traffic control plans and coordinate and schedule meetings with the Utility owners in order to make every effort not to impact the overall construction schedule. Unless otherwise approved by the Engineer, abandoned above ground appurtenances such as pedestals shall be removed and abandoned; underground utilities and manholes/handholds shall be abandoned in place.

Utility owners are responsible for obtaining all necessary permits, as required.

The following items of work are expected to be completed prior to, or coordinated with, construction.

Contractor shall contact utility owners 5 days prior to potholing to allow their observation of potholing activities

All Utility Owners:
Contractor shall locate and pothole all potential conflicts with existing buried utility facilities with the proposed construction, as shown on the plans or by field location markings. If a conflict exists, modify proposed construction plans to avoid all existing buried utility facilities as approved by the Engineer.

The work listed below shall be performed by the Utility Companies or their agents in accordance with the plans and specifications, and as directed by the Engineer.

City of Idaho Springs:
Inspect utility work performed by the Contractor listed above. The Contractor shall provide the utility owner written notice five days immediately prior to required inspections.

Xcel Energy (Electric):

Xcel Energy shall set an electric meter for the pedestrian lighting system to final grade and roadway alignment at the location shown in the plans. Coordinate timing of meter set with Xcel when the system in installed and ready for use.

Xcel Energy (Gas):
Xcel Energy shall install a new gas main and abandon the existing gas distribution main in Central Miner St. and Soda Creek Road. Xcel Energy will also install and abandon the High Pressure Gas. The work is expected to be completed per a Work Order executed by the City of Idaho Springs and be performed at no cost to the project.

The Contractor shall provide the utility owner written notice a minimum of ten days immediately prior to required inspections.

The Contractor shall provide the utility owner written notice ten days prior to each utility work element expected to be coordinated with construction.

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 locations of utility facilities as shown on the plan and profile sheets, and herein described, 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 108.07 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.