

Standard Contract  
REV 04/13



# RENEWAL WHEAT RIDGE

## PROJECT DOCUMENTS

**44<sup>th</sup> & VANCE TRAFFIC SIGNAL  
ITB-RWR-16-2  
JUNE 2016**

Prepared by:  
DEPARTMENT OF PUBLIC WORKS  
ENGINEERING DIVISION

CITY OF WHEAT RIDGE  
7500 W. 29TH AVENUE  
WHEAT RIDGE, CO 80033  
(303) 235-2861 Engineering  
(303) 235-2857 (FAX)

The engineering material and data contained in these Project Documents were prepared under the supervision and direction of Mark A Westberg, PE, Projects Supervisor.

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**CITY OF WHEAT RIDGE  
FOR RENEWAL WHEAT RIDGE  
SOLICITATION # ITB-RWR-16-2**

**BID DUE DATE: TUESDAY, JULY 26, 2016 BY 1:00 PM OUR CLOCK**

**44<sup>th</sup> & VANCE TRAFFIC SIGNAL**

**SEALED BIDS MUST BE MAILED OR DELIVERED TO:**

City of Wheat Ridge Municipal Building  
Attention: Jennifer Nellis, CPPB  
7500 West 29<sup>th</sup> Avenue, Purchasing & Contracting Division  
Wheat Ridge, CO 80033  
303-235-2811

**IMPORTANT: PLEASE READ ENTIRE DOCUMENT**  
Per the attached specifications, terms and conditions.

FEIN/SSN (Required) \_\_\_\_\_  
Federal I.D. Number

COMPANY NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY/STATE/ZIP \_\_\_\_\_

PHONE \_\_\_\_\_ EMAIL \_\_\_\_\_

TYPED/PRINTED NAME \_\_\_\_\_

AUTHORIZED SIGNATURE \_\_\_\_\_  
This is required. Must be in ink.

TITLE \_\_\_\_\_

ACKNOWLEDGE ADDENDAS, MUST INITIAL \_\_\_\_\_ NUMBER OF ADDENDA \_\_\_\_\_  
(Bidder is responsible for following up on all addendums)

**DO NOT CONTACT THE REQUESTING DEPARTMENT OR MEMBER OF THE EVALUATION COMMITTEE.**

Signature acknowledges that Bidder: has read the bid documents thoroughly before submitting a bid, will fulfill the obligations in accordance to the scope of work or specifications, terms, and conditions, and is submitting without collusion with any other individual or firm. Do not submit more than one bid from your firm or both bids will be disqualified. Submit bid with authorized signature.

**Point of Contact:** Jennifer Nellis, Purchasing Agent, [jnellis@ci.wheatridge.co.us](mailto:jnellis@ci.wheatridge.co.us) or fax 303-234-5924

**MUST SUBMIT PAGE THREE / SIGNATURE PAGE WITH BID**

**INVITATION TO BID  
ITB-RWR-16-2  
44<sup>th</sup> & VANCE TRAFFIC SIGNAL**

**Bid Due Date:** TUESDAY, JULY 26, 2016 by 1:00 pm our clock. Public Opening: City Hall, 7500 W. 29<sup>th</sup> Avenue, Wheat Ridge, CO.

**Scope of Work:** Provide all labor, equipment and materials to purchase and install 3 traffic signals/poles, with one having 2 mast arms, with pedestrian facilities and related improvements. Cost Range is \$250,000 to \$300,000. Anticipated start date is August 22, 2016. Completion time is approximately 40 working days. A pre-bid conference will not be held for this project.

**Deadline for Questions:** July 15, 2016 by 12:00 Noon

**Contractor Qualification:** Bidder must complete and submit the Contractor Qualification Form provided with the bid document. Failure to complete this form and submit with bid may result in the disqualification of the contractor. Renewal Wheat Ridge's acceptance of this bid shall be based on information provided by the contractor in this form. Bid amount and qualifications are evaluated subsequent to bid opening to determine the successful bidder. Renewal Wheat Ridge does not pre-qualify contractors.

**Disadvantaged Businesses:** Disadvantaged business enterprises are afforded full opportunity to submit bids and will not be discriminated against on the grounds of race, color or national origin in consideration for an award.

**Illegal Alien Compliance:** Contractors shall comply with the amended provisions of CRS 8-17.5-101 regarding employment of illegal aliens to perform on public contracts.

**Bid Bond:** A 5% bid bond is required to be submitted with the bid. Payment and performance bonds for 100% of the contract price and insurance will be required for the successful bidder.

**Submit Sealed Bids to:** City of Wheat Ridge Municipal Building  
On behalf of Renewal Wheat Ridge  
Attn: Jennifer Nellis, CPPB  
7500 W 29<sup>th</sup> Avenue, Purchasing Division  
Wheat Ridge, CO 80033

**Mark Sealed Envelopes:** ITB-RWR-16-2, 44<sup>th</sup> & VANCE TRAFFIC SIGNAL

**Comments:** All bids will be validated. No bids will be accepted after the bid due time. Bids received after the bid opening time will be filed unopened. Renewal Wheat Ridge reserves the right to reject any and all bids or any part and to waive any formalities or informalities to make an award in the best interest of Renewal Wheat Ridge.

**Bid Documents:** Available on the Rocky Mountain E-Purchasing System at [www.rockymountainbidsystem.com](http://www.rockymountainbidsystem.com) (800-835-4603 option #2).

**Point of Contact:** Jennifer Nellis, Purchasing Agent, [jnellis@ci.wheatridge.co.us](mailto:jnellis@ci.wheatridge.co.us) or fax 303-234-5924 or phone 303-235-2811. Do not contact the requesting department.

**Publish Dates:**

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Jennifer Nellis, Purchasing Agent

Daily Journal: July 5 & July 11, 2016  
City Web/RMEPS: July 5, 2016

## INFORMATION FOR BIDDERS

### 1.0 BID SUBMISSION REQUIREMENTS

- 1.1 Sealed Bids for **ITB-RWR-16-2, 44<sup>th</sup> & VANCE TRAFFIC SIGNAL** will be received by the City of Wheat Ridge on behalf of Renewal Wheat Ridge, deliver bids to the Office of the Purchasing Agent, City of Wheat Ridge, 7500 W. 29th Avenue, Wheat Ridge, CO 80033, as stated in the Advertisement. BID OPENING DATE IS SET FOR TUESDAY, JULY 26, 2016 BY 1:00 PM OUR CLOCK at which time bids will be publicly opened and read aloud.

Questions about this bid shall be referred to Jennifer Nellis, Purchasing Agent, by email [jnellis@ci.wheatridge.co.us](mailto:jnellis@ci.wheatridge.co.us)

- 1.2 Bid Documents: available on the Rocky Mountain Purchasing Group at [www.rockymountainbidsystem.com](http://www.rockymountainbidsystem.com) (800-835-4603 option #2). and the City website at [www.ci.wheatridge.co.us](http://www.ci.wheatridge.co.us) Limited hard copies are available in the Purchasing Office for a non-refundable and no returnable cost of \$25.00. Cash or check only.

Renewal Wheat Ridge and/or the City does not assume any responsibility for errors or misinterpretations resulting from the use of incomplete sets of bidding documents.

Renewal Wheat Ridge in making copies of the bidding documents available on the terms in this Project Manual does so only for the purpose of obtaining bids on the Work and does not confer a license of grant for use.

- 1.3 Two **(2) copies** of the Project Document/Proposal must be submitted and signed. Single copies of the original bid bond will be accepted. All blank spaces for prices must be filled in, in ink or typewritten, and the Proposal Form must be fully completed and executed when submitted. In the case of discrepancies, the unit price shall govern the extension and subsequent total. No alteration in bid prices by erasures, deletions or strike-outs, will be acceptable unless each alteration is signed or initialed by the Bidder. A conditional or qualified Bid will not be accepted.

The Project Documents contain an affidavit certifying that the Bidder has not participated in any collusion or taken any action in restraint of free competitive bidding. This form must be signed and submitted with the Bid.

Names of all subcontractors and the amounts of their subcontract work shall be provided on the List of Subcontractors, as provided in this bid. If none, state "none".

- 1.4 Bids may be mailed or delivered in person, but must be in a sealed envelope. The envelope should bear on the outside the name of the project for which the Bid is submitted. No bids will be accepted after the date and time established above, except by written addendum.
- 1.5 Each Bid must be accompanied by a Bid Bond payable to Renewal Wheat Ridge for five percent (5%) of the total amount of the Bid. A certified check or cashier's check payable to Renewal Wheat Ridge may be used in lieu of a Bid Bond. Securities may not be substituted for Bid Bonds.

Attorneys-in-Fact who sign Bid Bonds must file with each Bond a certified and effective dated copy of their Power of Attorney.

Surety companies executing bid and performance bonds must appear on the Treasury Departments most current list (Circular 570 as amended) and be authorized to transact business in the State of Colorado.

- 1.6 A bidder may withdraw or revise a proposal after it has been deposited with Renewal Wheat Ridge. Withdrawal of bids may be made either in writing or in person; however, any bid withdrawn for purpose of revision must be re-deposited with Renewal Wheat Ridge before the time set for opening of bids. Bids may not be withdrawn after the time set for opening of bids.
- 1.7 Renewal Wheat Ridge assumes no responsibility for late deliveries of mail on behalf of the United States Post Office. Only sealed bids received by the Purchasing Department will be accepted. Bids submitted by telephone, facsimile machine, or by other electronic means are not acceptable.

In the event of a situation severe enough to cause the City to close its offices for any reason, the Purchasing Agent has the prerogative of rescheduling the bid opening time and date. No bidder will be considered above

all other bidders by having met the bid opening time and date requirements to the exclusion of those who were unable to present their bid due to the closing of City offices.

- 1.8 Issuance of this Request for Bid does not commit Renewal Wheat Ridge to award any contract or to procure or contract for any equipment, materials, or services. Renewal Wheat Ridge further reserves the right to waive informalities or irregularities, and the right to accept or reject any and all bids, including but not limited to, any bid which does not meet bonding requirements, or bids which do not furnish the quality, or offer the availability of materials, equipment or services as required by the specifications, description or scope of services, or bids from bidders who lack experience or financial responsibility, or bids which are not to form, or to award bids to the lowest and most responsive and responsible bidder, or to require new bids.

No award will be made to any person, firm, or corporation that is in arrears upon any obligation to Renewal Wheat Ridge.

- 1.9 Renewal Wheat Ridge is exempt from City, County, State and Federal Sales/Excise Taxes. Certificates will be issued upon request.

## 2.0 BID DOCUMENTS

- 2.1 The Contract Documents consist of the Contract Bid Documents including construction specifications, if any. The Contract Bid Documents contain the provisions required for the bidding and construction of the Project. The Renewal Wheat Ridge shall provide to Bidders, prior to Bidding, all information that is pertinent to, and delineates and describes, the Work. This may occur on the plans or on a separate document.

- 2.2 Each Bidder is responsible for inspecting the site and for reading and being thoroughly familiar with the Contract Documents, including Addenda. The failure or omission of any Bidder to do any of the foregoing shall in no way relieve any Bidder from any obligation in respect to his Bid. After Bids have been submitted, the Bidder shall not assert that there was a misunderstanding concerning the quantities of Work or of nature of the Work to be done or any materials specified for the Work.

- 2.3 If it should appear to a Bidder that the work to be done or matters relative thereto are not sufficiently described or explained in the Contract Documents or that the Contract Documents are not definite and clear, the Bidder may make written inquiry regarding same to the Purchasing Agent at least five (5) working days or a designated date set by the Purchasing Agent, before the scheduled closing time for filing Bids. Then, if in the judgment of the Purchasing Agent, additional, information or interpretation is necessary, such information will be supplied in the form of an Addendum, and will be delivered to all individuals, firms and corporations who have received the Contract Documents. Such Addendum shall have the same binding effect as though contained in the main body of the Contract Documents. **Oral instructions or information concerning the contract documents or the project given out by officers, employees or agents of Renewal Wheat Ridge to prospective bidders shall not bind Renewal Wheat Ridge.** If no request is made in the five working days or the designated time, Bidder waives right to any conflict in the Contract Documents.

- 2.4 All applicable laws, ordinances and the rules and regulations of all authorities having jurisdiction over construction of the Project shall apply to the Contract throughout. Further, the Bidder agrees to abide by the following federal requirements: Executive Order No. 11246 as amended, including specifically the provisions of the Equal Opportunity Clause, the Immigration Reform and Contract Act of 1986 and the Americans with Disabilities Act of 1991.

- 2.5 **Contractor Qualification:** Bidder must complete and submit the Contractor Qualification Form provided with the bid document. Failure to complete this form and submit with bid may result in the disqualification of the contractor. Renewal Wheat Ridge's acceptance of this bid shall be based on information provided by the contractor in this form. Bid amount and qualification shall be evaluated subsequent to bid opening to determine the successful bidder. Renewal Wheat Ridge does not pre-qualify contractors.

## 3.0 CONTRACT AWARD

- 3.1 Renewal Wheat Ridge may make such investigations as deemed necessary to determine the ability of the Bidder and Subcontractors to perform the Work, and the Bidder shall furnish to the Owner all such information and data for this purpose as Renewal Wheat Ridge may request. Renewal Wheat Ridge reserves the right to reject any Bid if the evidence submitted, or investigation fails to satisfy Renewal Wheat Ridge that such Bidder or any Subcontractor is properly qualified to carry out the obligations of the Agreement. If Renewal Wheat

Ridge rejects any Subcontractor as unqualified, the Bidder may substitute another Subcontractor for approval by Renewal Wheat Ridge but no change to the Bid Price will be allowed.

- 3.2 The Award of Contract, is anticipated, within 60 calendar days after the opening of bids to the lowest most responsive, responsible qualified bidder whose bid complies with all the requirements of this request for bids. Award is in the best interest of Renewal Wheat Ridge.
- 3.3 The successful bidder shall be notified of the recommendation for award and to provide two (2) signed agreements, insurance and bonds. A Performance Bond and Payment Bond, each in the amount of 100 percent (100%) of the Contract Price, with a corporate surety approved by Renewal Wheat Ridge, will be required for the faithful performance of the Contract. Securities may not be substituted for Payment or Performance Bonds. Attorneys-in-Fact who sign Payment and Performance Bonds must file with each Bond a certified and effective dated copy of their Power of Attorney.
- 3.4 The successful bidder shall return the two copies of the executed Agreement and one acceptable Performance and Payment Bonds by a designated date. In case the Bidder fails to comply by the designated date or if the Bidder fails to provide acceptable bonds, Renewal Wheat Ridge may, at its option, consider the Bidder in default, in which case the Bid Bond accompanying the Proposal (Bid) shall become the property of Renewal Wheat Ridge.
- 3.5 Renewal Wheat Ridge, within 14 calendar days of receipt of the requirement stated in 3.3 above, shall execute the Agreement and issue the Notice to Proceed at a pre-construction meeting with the Contractor. If Renewal Wheat Ridge cannot issue the Notice to Proceed within such time period, the time period will be extended by mutual agreement between Renewal Wheat Ridge and Contractor. If the Notice to Proceed has not been issued within the 14 calendar day period or within the period mutually agreed upon, the Contractor may terminate the Agreement, by Written Notice, without further liability on the part of either party.
- 3.6 Upon receiving notice of award, the Contractor may obtain from Renewal Wheat Ridge three sets of documents at no cost. Additional sets of drawings and specifications may be purchased on a cash sale basis from Renewal Wheat Ridge. The Contractor and Renewal Wheat Ridge will agree on the date that Work will commence which shall be within 14 calendar days of the date of the Notice to Proceed, unless a time extension is approved by the Owner.

IMPORTANT: THIS FORM MUST BE COMPLETED AND SUBMITTED WITH YOUR BID

## CONTRACTOR'S QUALIFICATION FORM

Your Bid Will Not Be Processed If Incomplete

### SECTION I - IDENTIFICATION

#### 1. Identification of Applicant Firm

A. \_\_\_\_\_  
Exact Legal Name of Applicant Firm DUNS #

B. \_\_\_\_\_  
Address City State Zip Code

C. \_\_\_\_\_  
(Mailing Address, if different from above)

D. Primary Company Telephone No. ( ) \_\_\_\_\_ Fax No. ( ) \_\_\_\_\_

E. Applicant Firm's Contact Person for Public Works Office follow-up:

Print or Type Name	Position	Telephone Number
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F. Has the Applicant Firm changed its address or has the Firm or its Owner(s) operated under any other name(s) including other DBAs in the past five years? If yes, explain fully on a separate sheet of paper.  
 No  Yes

G. Type of business organization: \_\_\_\_\_

YEAR organization established: \_\_\_\_\_ NUMBER of current full time employees: \_\_\_\_\_

Sole Proprietor  Corporation  
[Date and State of Incorporation \_\_\_\_\_]

Limited Partnership  General Partnership  
[Date and State of Partnership filing \_\_\_\_\_]

Limited Liability Company  Limited Liability Partnership  
[Date and State of filing \_\_\_\_\_]

Other (describe) \_\_\_\_\_

Type of service(s) to be provided to Renewal Wheat Ridge.

- |   |  |
|---|--|
| <input type="checkbox"/> General Contractor | <input type="checkbox"/> Concrete Flatwork     |
| <input type="checkbox"/> Storm Sewer        | <input type="checkbox"/> Concrete Structures   |
| <input type="checkbox"/> Traffic Signals    | <input type="checkbox"/> Slurry Seal           |
| <input type="checkbox"/> Grading            | <input type="checkbox"/> Fog Seal              |
| <input type="checkbox"/> Asphalt Paving     | <input type="checkbox"/> Crack Sealing         |
| <input type="checkbox"/> Concrete Paving    | <input type="checkbox"/> Landscaping           |
| <input type="checkbox"/> Signing            | <input type="checkbox"/> Striping              |
| <input type="checkbox"/> Traffic Control    | <input type="checkbox"/> Other (describe)_____ |

**SECTION II - OWNERSHIP/MANAGEMENT, PROJECT MANAGEMENT, SUPERVISORS, AND RELATED ENTITIES**

**1. Owners**

List Owners of Applicant Firm.

Full Legal Name	Title	Years of Related Experience	% Of Ownership

[Use additional sheets if necessary]

**2. Project Management Team, Supervisors and Employees Who Will Be Working Directly On The Project(s).**

List the full names of the primary employees of the proposed Project Team.

Full Legal Name	Present Position	Years of Related Experience	% of Time Devoted to Project	Professional Licenses

[Use additional sheets if necessary]

**3. Resume**

Attach resumes of the Project Management Team showing the last five years of employment in this field. Resumes must be comprehensive and include of Firms worked for and dates of employment. (RESUMES are not required from Materials Suppliers (Vendors)).

**4. Contractor's License(s)**

The awarded Contractor must obtain or have a current City of Wheat Ridge Municipal Contractor's License within 7 days of approval of bid award.

**SECTION III - CONTRACTING HISTORY**

**1. Contracting History**

A. List the applicant Firm's six largest contracts in the last three years.

1. Company Name \_\_\_\_\_ Contact Name \_\_\_\_\_  
Street Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_  
Phone No: \_\_\_\_\_ Fax No: \_\_\_\_\_  
Contract Name & Number \_\_\_\_\_  
Contract Amount \_\_\_\_\_ Start/Completion Dates \_\_\_\_\_  
Description of Work \_\_\_\_\_  
\_\_\_\_\_  
Prime or Subcontractor \_\_\_\_\_

2. Company Name \_\_\_\_\_ Contact Name \_\_\_\_\_  
Street Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_  
Phone No: \_\_\_\_\_ Fax No: \_\_\_\_\_  
Contract Name & Number \_\_\_\_\_  
Contract Amount \_\_\_\_\_ Start/Completion Dates \_\_\_\_\_  
Description of Work \_\_\_\_\_  
\_\_\_\_\_  
Prime or Subcontractor \_\_\_\_\_

**SECTION III - CONTRACTING HISTORY – (Continued)**

3. Company Name \_\_\_\_\_ Contact Name \_\_\_\_\_  
Street Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_  
Phone No: \_\_\_\_\_ Fax No: \_\_\_\_\_  
Contract Name & Number \_\_\_\_\_  
Contract Amount \_\_\_\_\_ Start/Completion Dates \_\_\_\_\_  
Description of Work \_\_\_\_\_  
\_\_\_\_\_  
Prime or Subcontractor \_\_\_\_\_

4. Company Name \_\_\_\_\_ Contact Name \_\_\_\_\_  
Street Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_  
Phone No: \_\_\_\_\_ Fax No: \_\_\_\_\_  
Contract Name & Number \_\_\_\_\_  
Contract Amount \_\_\_\_\_ Start/Completion Dates \_\_\_\_\_  
Description of Work \_\_\_\_\_  
\_\_\_\_\_  
Prime or Subcontractor \_\_\_\_\_

5. Company Name \_\_\_\_\_ Contact Name \_\_\_\_\_  
Street Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_  
Phone No: \_\_\_\_\_ Fax No: \_\_\_\_\_  
Contract Name & Number \_\_\_\_\_  
Contract Amount \_\_\_\_\_ Start/Completion Dates \_\_\_\_\_  
Description of Work \_\_\_\_\_  
\_\_\_\_\_  
Prime or Subcontractor \_\_\_\_\_

**SECTION III - CONTRACTING HISTORY – (Continued)**

6. Company Name \_\_\_\_\_ Contact Name \_\_\_\_\_  
Street Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_  
Phone No: \_\_\_\_\_ Fax No: \_\_\_\_\_  
Contract Name & Number \_\_\_\_\_  
Contract Amount \_\_\_\_\_ Start/Completion Dates \_\_\_\_\_  
Description of Work \_\_\_\_\_  
\_\_\_\_\_  
Prime or Subcontractor \_\_\_\_\_

In the past five years has the Applicant Firm or any Affiliate been the subject of any of the following actions?

- A. Been suspended, debarred, disqualified, or otherwise declared ineligible to bid?  
 No  Yes
- B. Failed to complete a contract for a commercial, private owner or Government agency?  
 No  Yes
- C. Been denied a low-bid contract in spite of being the low bidder?  
 No  Yes
- D. Had a contract terminated for any reason, including default?  
 No  Yes
- E. Had liquidated damages assessed against it during or after completion of a contract?  
 No  Yes

If "Yes" to Sections IV, V or VI, provide details including a brief summary of cause(s) of action, indicate if Applicant Firm, Owner or Affiliate Firms were plaintiffs (P) or defendants (D); define charges explicitly, by what authority, court or jurisdiction, etc. Complete details are required!

NOTE: For Sections IV and V below, the definition of an "investigation" includes: an appearance before a grand jury by representatives of the Firm; any oral or written inquiry or review of the Firm's documents by a governmental or law enforcement agency or investigative agency; or questioning of employees concerning the general operation or a specific project or activities of the Firm

## SECTION IV - CIVIL ACTIONS

### 1. Violations Of Civil Law

In the past five years has Applicant Firm, any of its Owners, or any Affiliate been the subject of an investigation of any alleged violation of a civil antitrust law, or other federal, state or local civil law?

No

Yes

### 2. Lawsuits With Public Agencies

At the present time is, or during the past five years has the Applicant Firm, any of its Owners, or any Affiliate been a plaintiff or defendant in any lawsuit regarding services or goods provided to Renewal Wheat Ridge or to a public agency?

No

Yes

### 3. Bankruptcy

During the past five years, has the Applicant Firm or any Affiliate filed for bankruptcy or reorganization under the bankruptcy laws?

No

Yes

### 4. Judgments, Liens And Claims

During the past five years, has the Applicant Firm been the subject of a judgment, lien or claim of \$10,000 or more by a subcontractor or supplier?

No

Yes

### 5. Tax Liens

During the past five years, has the Applicant Firm been the subject of a tax lien by federal, state or any other tax authority?

No

Yes

## SECTION V - COMPLIANCE WITH LAWS AND OTHER REGULATIONS

### 1. Criminal

In the past five years has the Applicant Firm, any of its Owners, or Affiliates:

A. Been the subject of an investigation involving any alleged violation of criminal law?

No

Yes

B. Been arrested, indicted or named as an unindicted co-conspirator in any indictment or other accusatory instrument?

No

Yes

C. Been convicted, after trial or by plea, of any felony under state or federal law?

No

Yes

D. Been convicted of any misdemeanor involving business-related crimes?

No

Yes

E. Entered a plea of nolo contendere to a charge of embezzlement, theft, forgery, bribery, falsification or destruction of records, receiving stolen property, or a violation of any antitrust laws?

No

Yes

F. Entered into a consent decree?

No

Yes

G. Been granted immunity from prosecution for any business-related conduct constituting a crime under state or federal law?

No

Yes

H. Taken the Fifth Amendment in testimony on any business-related crime?

No

Yes

I. Paid a fine or settlement to resolve any criminal or civil violations or allegations involving a business activity?

No

Yes

J. Do any Owners in Applicant Firm have any felony charges pending against them that were filed either before, during, or after their employment with the Applicant Firm?

No

Yes

### 1. Regulatory Compliance

In the past five years, has Applicant Firm, any of its Owners, or Affiliates been cited for:

A. A violation of any labor law or regulation, including prevailing wage rates and fair labor practices?

No

Yes

B. An OSHA violation?

No

Yes

C. A violation of federal, state or local environmental laws or regulations?

No

Yes

D. Any other administrative, statutory or regulatory violations?

No

Yes

## SECTION VI - ETHICS

### 1. False Statements, Bribes, Collusion

In the past five years has the Applicant Firm, any of its Owners, or Affiliates:

A. Filed with a government body (including Renewal Wheat Ridge) or submitted to a government employee (including Renewal Wheat Ridge employee) any form of document known by the Applicant Firm, any of its Owners, or by the person submitting the document, to contain false information?

No

Yes

B. Created or maintained false business records?

No

Yes

C. Given, or offered to give, money or any other benefit to a public official or employee with intent to influence that person regarding any of their official acts, duties or decisions?

No

Yes

D. Given, or offered to give, money or other benefit to an official or employee of a private business with intent to induce that official or employee to engage in unethical or illegal business activities (including but not limited to improper gratuities, and/or violations of lobbying regulations)?

No

Yes

E. Agreed with another to bid below prevailing market rate?

No

Yes

F. Agreed with another to submit identical or complimentary bids or otherwise not to bid competitively?

No

Yes

G. Agreed with another not to submit competitive bids in another's territory established either by geography or customers?

No

Yes

H. Agreed with another to take turns in obtaining contracts by pre-determining which Firm shall submit the lowest bid?

No

Yes

**1. Conflict Of Interest**

- A. Does the Applicant Firm, any of its Owners or Project Team Members have any existing relationships that could be construed as either personal or organizational conflicts of interest, or which would give rise to a conflict if Applicant Firm should be a recipient of a contract with Renewal Wheat Ridge?  
 No  Yes
  
- B. Has any Owner or Project Team member of Applicant Firm ever (if yes explain fully):
  - 1. Been an employee of Renewal Wheat Ridge, or served as a Member of the Renewal Wheat Ridge Board?  
 No  Yes
  
  - 2. Been related by blood or marriage to a Renewal Wheat Ridge employee or Board Member?  
 No  Yes

**SECTION VII - ADDITIONAL DOCUMENTATION REQUIRED**

**Additional document copies to be submitted with this application:**

Letter of Reference from your Firm's Surety, which states current available aggregate and single project bonding capacity (This Application will not be processed without this letter)

List of Major Equipment by number and type available for the Project(s).

Certification of all IMSA certified personnel, if applying for traffic signal project(s). A minimum of two full time employees must be certified at Level II or higher.

**PROPOSAL FORM**  
**ITB-RWR-16-2**  
**44<sup>th</sup> & VANCE TRAFFIC SIGNAL**

This is the Proposal (Bid) of \_\_\_\_\_ (hereinafter called "BIDDER") or organized and existing under the laws of the State of \_\_\_\_\_ doing business as a \_\_\_\_\_ (Insert "a corporation", "a partnership", or "an individual" as applicable.)

To RENEWAL WHEAT RIDGE (hereinafter called "Owner").

The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Contract Bid Documents, to complete all Work as specified or indicated in the Contract Bid Documents for the Contract Sum and within the Contract time indicated in accordance with the Contract Bid Documents.

Bidder accepts all of the terms and conditions of the Instructions to Bidders. The Bid will remain open for sixty days after the day of Bid opening. Bidder will sign the Agreement and submit any documents required by the Contract documents within seven (7) calendar days after notification or the designated date.

By submission of this Bid, each Bidder certifies, and in the case of a joint Bid, each party thereto certifies as to his own organization, that this Bid has been arrived at independently without consultation, or communication with any competitor. Every bid submitted to Renewal Wheat Ridge shall contain a statement certifying that the Bidder has not participated in any collusion or taken any action in restraint of free competitive bidding. This statement shall be in the form of an affidavit provided by Renewal Wheat Ridge and included in the Bid Proposal. The Bidders proposal will be rejected if it does not contain the completed Non-collusion Affidavit.

Bidder agrees to abide by the following federal requirements:

- Executive Order No. 11246 as amended, including specifically, the provisions of the Equal Opportunity Clause, the Immigration Reform and Contract Act of 1986, and the Americans with Disabilities Act of 1991.
- United States Department of Transportation Title VI Regulations at 49 CFR Part 21 the Civil Rights Act of 1964, assuring that no person shall on the grounds of race, color, or national origin be excluded from participation in the opportunity to bid, or be discriminated against in consideration of award of this project.

Bidder hereby agrees to commence Work under this contract on or before a date to be specified in the Notice to Proceed and to fully complete the Project within **40 working days**.

The Notice to Proceed shall be issued within fourteen (14) days of the execution of the Agreement by the Owner. Should there be reason why the Notice to Proceed cannot be issued within such period, the time may be extended by mutual agreement between the Owner and Contractor. If the Notice to Proceed has not been issued within the period mutually agreed upon, the Contractor may terminate the Agreement without further liability on the part of either party.

The Owner may make such investigations as he deems necessary to determine the ability of the Bidder to perform the Work, and the Bidder shall furnish to the Owner all such information and data for this purpose as the Owner may request. The Owner reserves the right to reject any Bid if the evidence submitted by, or investigation of, such Bidder fails to satisfy the Owner that such Bidder is properly qualified to carry out the obligations of the Agreement.

Bidder has examined the site and locality where the Work is to be performed, the legal requirements (federal, state and local laws, ordinances, rules and regulations) and the conditions affecting cost, progress, or performance of the Work and has made such independent investigation as Bidder deems necessary.

Bidder will complete the Work for all accepted bid items.

**PROPOSAL FORM, CONTINUED**  
**ITB-RWR-16-2**  
**PRICING SCHEDULE**

Provide all materials, labor, and equipment to complete the work as per the specifications. It is the Owner's intent to award a single contract to the lowest qualified bidder.

Project: ITB-RWR-16-2, 44th & VANCE TRAFFIC SIGNAL

---

Company Name Date

---

Authorized Signature Title

---

Printed Name

---

Title

---

License No. Type Expiration Date

ATTEST:

---

Printed Name

---

Signature Title

SEAL  
(If bid is by corporation)

ADDENDA

Bidder acknowledges receipt of the following Addenda:

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**BID SCHEDULE**            COMPANY SUBMITTING BID \_\_\_\_\_  
**ITB-RWR-16-2**

Bidder agrees to perform all the work described in the Contract Documents for the following unit prices or lump sums.

<b>ITEM NO.</b>	<b>PAY ITEM</b>	<b>ESTIMATED QUANTITY</b>	<b>UNIT</b>	<b>UNIT PRICE</b>	<b>EXTENSION</b>
202	Removal of Asphalt Mat (Full Depth)	14	SY	\$ _____	\$ _____
202	Removal of Median Cover Material	4	SY	\$ _____	\$ _____
202	Removal of Concrete Sidewalk	18	SY	\$ _____	\$ _____
202	Removal of Curb & Gutter	37	LF	\$ _____	\$ _____
202	Removal of Concrete Curb Ramp	14	SY	\$ _____	\$ _____
202	Removal of Ground Sign	3	EA	\$ _____	\$ _____
210	Reset Water Valve	1	EA	\$ _____	\$ _____
403	Hot Mix Asphalt (Patching – 9 Inch)	9	SY	\$ _____	\$ _____
503	Drilled Caisson (18 Inch)	8	LF	\$ _____	\$ _____
503	Drilled Caisson (42 Inch)	19	LF	\$ _____	\$ _____
608	Concrete Sidewalk (6 Inch)	18	SY	\$ _____	\$ _____
608	Concrete Curb Ramp	23	SY	\$ _____	\$ _____
609	Curb & Gutter Type 2 (Section I-B)	23	LF	\$ _____	\$ _____
609	Curb & Gutter Type 2 (Section II-B)	47	LF	\$ _____	\$ _____
610	Median Cover Material (Patterned Concrete)	30	SF	\$ _____	\$ _____
613	2 Inch Electrical Conduit (Plastic)	280	LF	\$ _____	\$ _____
613	3 Inch Electrical Conduit (Plastic)	525	LF	\$ _____	\$ _____
613	Wiring	1	LS	\$ _____	\$ _____
613	Street Light Luminaire (LED)	3	EA	\$ _____	\$ _____
613	Traffic Signal Electrical Meter	1	EA	\$ _____	\$ _____
614	Sign Panel (Class I)	85	SF	\$ _____	\$ _____
614	Signal Head Backplate	10	EA	\$ _____	\$ _____
<b>SUBTOTAL THIS PAGE</b>				<b>\$ _____</b>	<b>\$ _____</b>

COMPANY SUBMITTING BID \_\_\_\_\_

<b>ITEM NO.</b>	<b>PAY ITEM</b>	<b>ESTIMATED QUANTITY</b>	<b>UNIT</b>	<b>UNIT PRICE</b>	<b>EXTENSION</b>
614	Pedestrian Signal Face (Countdown)	4	EA	\$ _____	\$ _____
614	Traffic Signal Face (12-12-12)	12	EA	\$ _____	\$ _____
614	Traffic Signal Face (12-12-12-12)	3	EA	\$ _____	\$ _____
614	Traffic Signal Controller & Cabinet	1	EA	\$ _____	\$ _____
614	Uninterruptable Power Supply	1	EA	\$ _____	\$ _____
614	Pedestrian Push Button (APS)	4	EA	\$ _____	\$ _____
614	Pedestrian Push Button Post Assembly	4	EA	\$ _____	\$ _____
614	Fire Preemption Unit and Timer	2	EA	\$ _____	\$ _____
614	Intersection Detection System (Thermal Cameras)	1	EA	\$ _____	\$ _____
614	Traffic Signal – Light Pole Steel (1-50, 1-45 foot Mast Arm)	1	EA	\$ _____	\$ _____
614	Traffic Signal – Light Pole Steel (1-20 foot Mast Arm)	1	EA	\$ _____	\$ _____
614	Traffic Signal – Light Pole Steel (1-35 foot Mast Arm)	1	EA	\$ _____	\$ _____
614	Traffic Signal Pedestal Pole Steel	2	EA	\$ _____	\$ _____
614	Traffic Signal Wireless Communication Unit	1	EA	\$ _____	\$ _____
617	Bollard	5	EA	\$ _____	\$ _____
620	Sanitary Facility	1	EA	\$ _____	\$ _____
625	Construction Surveying	1	LS	\$ _____	\$ _____
626	Mobilization	1	LS	\$ _____	\$ _____
627	Pavement Marking Tape (24")	200	LF	\$ _____	\$ _____
627	Preformed Pavement Marking (Arrow – 15.5 SF)	8	EA	\$ _____	\$ _____
627	Preformed Pavement Marking (Arrow – 27.5 SF)	1	EA	\$ _____	\$ _____
627	Preformed Pavement Marking (Only – 22.5 SF)	2	EA	\$ _____	\$ _____
630	Traffic Control Management	1	LS	\$ _____	\$ _____
720	Materials Sampling & Testing	1	LS	\$ _____	\$ _____

SUBTOTAL THIS PAGE \$ \_\_\_\_\_

TOTAL AMOUNT OF BID \$ \_\_\_\_\_

WRITTEN OUT AMOUNT OF BID \_\_\_\_\_



**RENEWAL WHEAT RIDGE**  
**NON-DISCRIMINATION ASSURANCE FORM**  
**TITLE VI REGULATIONS AT 49 CFR PART 21**

Title VI of the Civil Rights Act of 1964 prohibits discrimination on the basis of race, color or national origin by any entity receiving federal financial assistance.

All bidders are hereby notified that Renewal Wheat Ridge will affirmatively ensure that disadvantaged business enterprises will be afforded full opportunity to submit bids in response to all invitations and will not be discriminated against on the grounds of race, color or national origin in consideration for an award. This applies to all solicitations for bids for work or material subject to the Regulations, and for all proposals for negotiated agreements.

The bidder, whose name and signature appear below, certifies and agrees as follows:

1. The bidder shall comply with the provisions of Title VI of the Civil Rights Act of 1964.
2. The bidder assures Renewal Wheat Ridge that disadvantaged business enterprises are afforded full opportunity to submit bids as sub-contractors or sub-consultants and will not be discriminated against on the grounds of race, color or national origin in consideration for award.
3. The bidder shall comply with all reasonable requests made in the course of an investigation of Title VI, the Regulations and this assurance by the Colorado Department of Transportation, the US Department of Transportation or Renewal Wheat Ridge, as a sub-recipient of Federal financial assistance.
4. The bidder agrees that the United States has a right to seek judicial enforcement with regard to any matter arising under Title VI, the Regulations and this assurance.

FIRM: \_\_\_\_\_  
(Print full legal name of company)

AUTHORIZED SIGNATURE: \_\_\_\_\_

Printed Name and Title: \_\_\_\_\_

Date Certified and Agreed: \_\_\_\_\_

Attestation: (A corporate attestation is required)

Place corporate seal below:

BY: \_\_\_\_\_  
Corporate Secretary or Equivalent

***Bidder must complete and SUBMIT this form with your bid/proposal or will be considered Non-Responsive and/or Non-Responsible and therefore disqualified from bidding.***

**RENEWAL WHEAT RIDGE**  
**CERTIFICATION STATEMENT FOR**  
**ILLEGAL ALIENS, COMPLIANCE TO HB 1343**

The Vendor, whose name and signature appear below, certifies and agrees as follows:

1. The Vendor shall comply with the provisions of CRS 8-17.5-101 et seq.
2. The Vendor shall not knowingly employ or contract with an illegal alien to perform work under this purchase order or enter into a contract with a subcontractor that knowingly employs or contracts with an illegal alien.
3. The Vendor represents, warrants, and agrees that it (i) has verified that it does not employ any illegal aliens, through participation in the Basic Pilot Employment Verification Program administered by the Social Security Administration and Department of Homeland Security, or (ii) otherwise shall comply with the requirements of CRS 8-17.5-102(2)(b)(I).
4. The Vendor shall comply with all reasonable requests made in the course of an investigation by the Colorado Department of Labor and Employment. If the Vendor fails to comply with any requirement of this provision or CRS 8-17.5-101 et seq., the City may terminate the above referenced purchase order for breach and the Vendor shall be liable for actual and consequential damages to Renewal Wheat Ridge.

CERTIFIED and AGREED to this \_\_\_\_\_ day of \_\_\_\_\_, 2016

BID NUMBER: \_\_\_\_\_

FIRM: \_\_\_\_\_  
(Print Full Legal Name)

Authorized Signature: \_\_\_\_\_

Print Name: \_\_\_\_\_

Print Title: \_\_\_\_\_ Date: \_\_\_\_\_

Attestation: (A corporate attestation is required.)

BY: \_\_\_\_\_ Place corporate seal here, if applicable  
Corporate Secretary or Equivalent

***Bidder must complete and SUBMIT this form with your bid/proposal or will be considered Non-Responsive and/or Non-Responsible and therefore disqualified from bidding.***

**RENEWAL WHEAT RIDGE**  
**NON-COLLUSION AFFIDAVIT**  
**ITB-RWR-16-2 44<sup>TH</sup> & VANCE TRAFFIC SIGNAL**

COMPANY SUBMITTING BID \_\_\_\_\_

STATE OF: \_\_\_\_\_

COUNTY OF: \_\_\_\_\_

\_\_\_\_\_ of lawful age, being duly sworn, on oath says that (s)he is the agent authorized by the Bidder to submit the attached bid. Affidavit further states that the Bidder has not been a party of any collusion among Bidders in restraint of freedom of competition by agreement to bid at a fixed price or to refrain from bidding; or any Federal, State or Municipal official or employees as to quantity, quality, or price in the prospective Contract, or any other items of said prospective Contract; or in any discussions between bidders and any Federal, State or Municipal official concerning exchange of money or other thing of value for special consideration in the letting of a Contract.

NAME \_\_\_\_\_

TITLE \_\_\_\_\_

Subscribed and sworn to before me this \_\_\_\_ day of \_\_\_\_\_, 2016

\_\_\_\_\_  
NOTARY PUBLIC SIGNATURE

My Commission Expires:

***Bidder must complete and SUBMIT this form with your bid/proposal or will be considered Non-Responsive and/or Non-Responsible and therefore disqualified from bidding.***

**BID BOND FORM**

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned,

\_\_\_\_\_  
(name and address of Contractor)

as Principal, and

\_\_\_\_\_  
(name and address of surety)

as Surety, are hereby held and firmly bound unto Renewal Wheat Ridge as Owner in the penal sum of

\_\_\_\_\_ for the payment of which, well and truly to be made, we

hereby jointly and severally bind ourselves, successors, and assigns.

Signed this \_\_\_\_\_ day of \_\_\_\_\_, 2016.

The condition of the above obligation is such that whereas the Principal has submitted to the Renewal Wheat Ridge a certain BID, attached hereto and hereby made a part hereof, to enter a contract in writing for the Project titled **ITB-RWR-16-2, 44<sup>th</sup> & VANCE TRAFFIC SIGNAL**.

NOW, THEREFORE,

- (a) If said Bid shall be rejected or,
- (b) If said Bid shall be accepted and the Principal shall execute and deliver a contract in the Form of Contract attached hereto (properly completed in accordance with the said Bid) and shall furnish a Bond for his faithful performance of said Contract, and for the payment for all persons performing labor or furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said Bid.

Then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its Bond shall be in no way impaired or affected by an extension of the time within which the Owner may accept such Bid; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

\_\_\_\_\_  
(Principal/Contractor)

\_\_\_\_\_  
(Surety)

By: \_\_\_\_\_

**IMPORTANT:** Surety companies executing Bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State where the project is located.

**RENEWAL WHEAT RIDGE  
ITB-RWR-16-2  
44<sup>th</sup> & VANCE TRAFFIC SIGNAL  
SAMPLE AGREEMENT**

THIS AGREEMENT, made this \_\_\_\_ day of \_\_\_\_\_ 2016 by and between Renewal Wheat Ridge, Colorado, hereinafter called "Owner" and \_\_\_\_\_, doing business as an individual, whose business address is \_\_\_\_\_, hereinafter called "Contractor".

WITNESSETH: That for and in consideration of the payments and agreements hereinafter mentioned the parties agree as follows:

1. The Contractor agrees to furnish all materials, supplies, tools, equipment, labor and other services necessary to complete the construction of the Project titled, **ITB-RWR-16-2, 44<sup>th</sup> & VANCE TRAFFIC SIGNAL**, in accordance with the Contract Bid Documents.
2. The Contractor agrees to perform all the Work described in the Contract Bid Documents and comply with the terms therein for the Total Contract amount of \_\_\_\_\_ **DOLLARS (\$\_\_\_\_\_)** which includes any alternates.
3. The Contractor agrees to commence the Work required by the Contract Documents within **Fourteen (14)** calendar days after the date of the Notice to Proceed and to complete the same within **40 WORKING DAYS** after the date of the Notice to Proceed unless the time for completion is extended otherwise by written changes to the Contract Bid Documents.
4. The term "CONTRACT BID DOCUMENTS" means and includes the following:

A	Signature Page	K	Bid Bond
B	Advertisement for Bids	L	Agreement
C	Information for Bidders	M	Payment Bond
D	Contractor Qualification	N	Performance Bond
E	Bid Form	O	Notice to Proceed
F	Bid Schedule	P	Final Receipt
G	List of Subcontractors	Q	Project Special Provisions
H	Non-Discrimination Assurance	R	General Provisions
I	Illegal Alien Certification	Q	Addenda
J	Non-Collusion Affidavit	S	Drawings/Exhibits
5. The Owner will pay to the Contractor in the manner and at such times as set forth in the General Conditions, such amounts as required by the Contract Documents.
6. FISCAL YEAR. Fiscal year for the Renewal Wheat Ridge shall commence on January 1 and end on December 31.
7. Pursuant to C.R.S. § 29-1-110, Renewal Wheat Ridge may not expend any money or enter into any contract in excess of the amounts appropriated by Renewal Wheat Ridge, and no contract shall exceed the appropriation therefor.
8. **NOTICES**  
Any notice or communication given pursuant to this Agreement to the City shall be made in writing:

<b>Renewal Wheat Ridge Contact:</b>	<b>Contractor Contact:</b>
Name:	Name:
Address:	Address:
E-mail:	Fax:
Phone:	Phone:
Fax:	Fax:

9. The Contractor agrees to abide by the requirements under EXECUTIVE ORDER NO. 11246 as amended, including specifically the provisions governed by the Equal Opportunity Commission and also to abide by the requirements of the IMMIGRATION REFORM AND CONTRACT ACT OF 1986 and the requirements of the AMERICANS WITH DISABILITIES Act of 1991; and the United States Department of Transportation Title VI Regulations at 49 CFR Part 21 requirements under the Civil Rights Act of 1964, assuring that no person shall on the grounds of race, color, or national origin be excluded from participation in the opportunity to bid, or be discriminated against in consideration of award of this project.
10. Illegal Aliens – Public Contracts for Services. CRS 8-17.5-101 and Public Law 208, 104<sup>th</sup> Congress, as amended and expanded in Public Law 156, 108<sup>th</sup> Congress, as amended:  
 The Contractor certifies that he/she shall comply with the provisions of CRS 8-17.5-101 et seq. The Contractor shall not knowingly employ or contract with an illegal alien to perform work under this contract or enter into a contract with a subcontractor that knowingly employs or contracts with an illegal alien. The Contractor represents, warrants, and agrees that it (i) has verified that it does not employ any illegal aliens, through participation in the Basic Pilot Employment Verification Program administered by the Social Security Administration and Department of Homeland Security, or (ii) otherwise will comply with the requirements of CRS 8-17.5-101 (2)(b)(I). The Contractor shall comply with all reasonable requests made in the course of an investigation by the CO Department of Labor and Employment. If the Contractor fails to comply with any requirement of this provision or CRS 8-17.5-101 et seq., the City may terminate this contract for breach and the Contractor shall be liable for actual and consequential damages to the City.
11. This Agreement shall be binding upon all parties hereto and their respective heirs, executors, administrators, successors, and assigns.

IN WITNESS WHEREOF, the parties hereto have executed, or caused to be executed by their duly authorized officials, this Agreement in **Two (2) copies**, each of which shall be deemed an original on the date first above written.

**ATTEST:**

\_\_\_\_\_  
 PATRICK GOFF, EXECUTIVE DIRECTOR

\_\_\_\_\_  
 DATE

(Seal)

**APPROVED AS TO FORM:**

\_\_\_\_\_  
 COREY HOFFMAN, ATTORNEY

\_\_\_\_\_  
 NAME

\_\_\_\_\_  
 TITLE

\_\_\_\_\_  
 DATE

**OWNER**

**RENEWAL WHEAT RIDGE  
 7500 WEST 29TH AVENUE  
 WHEAT RIDGE, CO 80033  
 303-234-5900**

\_\_\_\_\_  
 TIM ROGERS, BOARD CHAIRPERSON

**CONTRACTOR**

\_\_\_\_\_  
 COMPANY NAME

\_\_\_\_\_  
 ADDRESS

\_\_\_\_\_  
 AUTHORIZED SIGNATURE

\_\_\_\_\_  
 PRINT NAME

\_\_\_\_\_  
 TITLE

\_\_\_\_\_  
 DATE

**PAYMENT BOND**

KNOW ALL MEN BY THESE PRESENTS: that

\_\_\_\_\_  
(Name of Contractor)

\_\_\_\_\_  
(Address of Contractor)

A \* \_\_\_\_\_ hereinafter called "PRINCIPAL", and

\_\_\_\_\_  
(Name of Surety)

\_\_\_\_\_  
(Address of Surety)

hereinafter called "Surety", are held and firmly bound unto Renewal Wheat Ridge, 7500 West 29th Avenue, Wheat Ridge, Colorado 80033, hereinafter called "Owner", in the penal sum of \_\_\_\_\_ **DOLLARS (\$ \_\_\_\_\_)** in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the Owner, dated the \_\_\_\_ day of \_\_\_\_\_ 2016, a copy of which is hereto attached and made a part hereof for the Project titled, **ITB-RWR-16-2, 44<sup>th</sup> & VANCE TRAFFIC SIGNAL.**

NOW, THEREFORE, if the Principal shall promptly make payment to all persons, firms, Subcontractors and corporations furnishing materials for or performing labor in the prosecution of the Work provided for in such contract, and any authorized extension or modification thereof, including all amounts due for materials, lubricants, oil, gasoline, coal and coke, repairs on machinery, equipment and tools, consumed or used in connection with the construction of such Work, and all insurance premiums on said WORK, and for all labor performed in such work whether by Subcontractor or otherwise, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said Surety for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the Work to be performed or the Specifications accompanying the same shall in any wise affect its obligation on this Bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the Work or to the Specifications.

\*Insert "a corporation", "a partnership", or "an individual" as applicable.

IN WITNESS WHEREOF, this instrument is executed in **ONE** part, each of which shall be deemed an original, this the

\_\_\_\_\_ day of \_\_\_\_\_, 2016

ATTEST:

**PRINCIPAL**

\_\_\_\_\_  
CORPORATE SECRETARY

\_\_\_\_\_  
PRINCIPAL

\_\_\_\_\_  
ADDRESS

\_\_\_\_\_  
BY

\_\_\_\_\_

\_\_\_\_\_  
ADDRESS

\_\_\_\_\_

(SEAL)

**SURETY**

**ATTEST:**

\_\_\_\_\_

\_\_\_\_\_  
SURETY

\_\_\_\_\_  
ADDRESS

\_\_\_\_\_  
BY (ATTORNEY IN FACT)

\_\_\_\_\_

\_\_\_\_\_  
ADDRESS

(SEAL)

\_\_\_\_\_

**Note:** Date of Bond must not be prior to date of Contract. If Contractor is partnership, all partners should execute bond.

**IMPORTANT:** Surety companies executing bonds must appear on the Treasury Department's most current list (Circular 570, as amended) and be authorized to transact business in the State of Colorado.

**PERFORMANCE BOND**

KNOW ALL MEN BY THESE PRESENTS: that

\_\_\_\_\_  
(Name of Contractor)

\_\_\_\_\_  
(Address of Contractor)

a (\*) \_\_\_\_\_, hereinafter called "PRINCIPAL", and

\_\_\_\_\_  
(Name of Surety)

\_\_\_\_\_  
(Address of Surety)

hereinafter called "Surety", are held and firmly bound unto Renewal Wheat Ridge, 7500 West 29th Avenue, Wheat Ridge, Colorado 80033, hereinafter called "Owner", in the penal sum of \_\_\_\_\_ **DOLLARS (\$\_\_\_\_\_)** in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, successors, and assigns jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the Owner, dated the \_\_\_\_ day of \_\_\_\_\_ 2016, a copy of which is hereto attached and made a part hereof for the Project titled, **ITB-RWR-16-2, 44<sup>th</sup> & VANCE TRAFFIC SIGNAL.**

NOW, THEREFORE, if the Principal shall well, truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions, and agreements of said Contract during the original term thereof, and any extensions thereof which may be granted by the Owner, with or without notice to the Surety and during the one year guarantee period, and if he shall satisfy all claims and demands incurred under such contract, and shall fully indemnify and save harmless the Owner from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the Owner all outlay and expense which the Owner may incur in making good any default, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said SURETY for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the Work to be performed or the Specifications accompanying the same shall in any wise affect its obligation on this Bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the Work or the Specifications.

PROVIDED, FURTHER, that no final settlement between the Owner and the Contractor shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

\*Insert "a corporation", "a partnership", or "an individual" as applicable.

IN WITNESS WHEREOF, this instrument is executed in **ONE** part, each of which shall be deemed an original, this the \_\_\_\_\_ day of \_\_\_\_\_, 2016.

**ATTEST:**

**PRINCIPAL**

\_\_\_\_\_  
CORPORATE SECRETARY

\_\_\_\_\_  
PRINCIPAL

\_\_\_\_\_  
ADDRESS

\_\_\_\_\_  
BY

\_\_\_\_\_  
ADDRESS

(SEAL)

ATTEST:

**SURETY**

\_\_\_\_\_  
SURETY

\_\_\_\_\_  
ADDRESS

\_\_\_\_\_  
BY (ATTORNEY IN FACT)

\_\_\_\_\_  
ADDRESS

(SEAL)

**Note:** Date of Bond must not be prior to date of Contract. If Contractor is partnership, all partners should execute bond.

**IMPORTANT:** Surety companies executing bonds must appear on the Treasury Department's most current list (Circular 570, as amended) and be authorized to transact business in the State of Colorado.

**NOTICE TO PROCEED**

TO:

FROM: **RENEWAL WHEAT RIDGE, CO**

RE: **ITB-RWR-16-2, 44<sup>th</sup> & VANCE TRAFFIC SIGNAL**

You are hereby notified to commence Work in accordance with the Agreement dated \_\_\_\_\_,

2016, on or before \_\_\_\_\_, 2016, and you are to complete the work within **40 WORKING DAYS**.

The date of completion of all work is \_\_\_\_\_, 2016

Dated this \_\_\_\_ day of \_\_\_\_\_ 2016.

By: \_\_\_\_\_  
Title: **ECONOMIC DEVELOPMENT MANAGER**

\*\*\*\*\*

**RECEIPT OF NOTICE**

Receipt of the above Notice to Proceed is hereby acknowledged by

\_\_\_\_\_ on this \_\_\_\_ of \_\_\_\_\_, 2016.

Printed Name \_\_\_\_\_

Signature \_\_\_\_\_

Title \_\_\_\_\_

**FINAL RECEIPT**

DATE: \_\_\_\_\_

TO: \_\_\_\_\_  
(Contractor)

\_\_\_\_\_  
(Address)

FROM: **RENEWAL WHEAT RIDGE, CO**

RE: **ITB-RWR-16-2, 44<sup>th</sup> & VANCE TRAFFIC SIGNAL**

Received this date, of the Owner, as full and final payment of the cost of the improvements provided for in the Project Contract Documents, the amount of \$ \_\_\_\_\_ in cash, being the remainder of the full amount accruing to the undersigned by virtue of said contract.

Said cash also covers and includes full payment for the cost of all extra work and material furnished by the undersigned in the construction of said improvements, and all incidentals thereto.

The undersigned hereby releases said Owner from all claims whatsoever which may develop from said contract.

These presents are to certify that all persons doing work upon or furnishing materials for said improvements under the foregoing contract have been paid in full.

Printed Name \_\_\_\_\_

Signature \_\_\_\_\_

Title \_\_\_\_\_

Date \_\_\_\_\_

**RENEWAL WHEAT RIDGE  
GENERAL PROVISIONS**

1. DEFINITIONS:

Renewal Wheat Ridge (also sometimes referred to as "Owner") is represented by Board members who will assume Project administration, oversight, and inspection responsibilities as further defined in the Contract, the General and Special provisions, and the current edition of CDOT Standard Specifications for Road and Bridge Construction. At the time of the preconstruction meeting, or when requested by the Contractor, the Owner shall provide an official list of Owner representatives and their titles as applies to the Project.

"Contractor" means the person, partnership, firm or corporation responsible for the physical accomplishment of the project.

"Subcontractor" means only those having a direct contract with the Contractor and includes one who furnished materials worked to a special design according to the plans or specifications for the work under the Contract, but does not include one who merely furnishes material not so worked.

"Notice" means written demand, instruction or order duly served. Written notice shall be deemed to have been duly served if delivered in person to the Contractor, or if delivered in person or sent by registered mail to the address given in the Contract and shall have been duly served upon the Owner if delivered to the Economic Development Manager of the Renewal Wheat Ridge, Municipal Building, Wheat Ridge, Colorado, either in person or by registered mail.

"Work" means performance of the Contractor or Subcontractor including labor and materials and all services incidental thereto.

"Cost" means all charges and expenditures of every kind applicable to the accomplishment of the work.

"Final Completion" means when all items are one hundred percent (100%) complete and when all known defective work has been corrected as certified by the Owner Representative.

"Substantial Completion Date" is the date on which the Owner Representative certifies the readiness of the work for beneficial occupancy or use, and is the date for terminating liability for liquidated damages and for determining incentive payments due for early completion.

2. MATERIALS, SERVICES, AND FACILITIES:

The Contractor shall and will, in good workmanlike manner, do and perform all work and furnish and pay for all labor, superintendence, material, utilities, machinery, equipment, tools, transportation, facilities, temporary construction of every nature and all other services and facilities of every nature, except as herein otherwise expressly specified, necessary or proper to perform and complete all the work, within the time stated, in accordance with the plans, drawings and specifications covered by the Contract, and any and all supplemental plans, drawings and specifications. He shall furnish, erect, maintain and remove such construction plant and such temporary works as may be required. It will be the responsibility of the Contractor to locate/negotiate a staging area. Renewal Wheat Ridge will not provide a staging area on City owned property. Any work necessary to be performed after regular working hours, on Saturdays, Sundays, or Legal Holidays, shall be performed without additional expense to Renewal Wheat Ridge.

3. CONTRACTOR'S TITLE TO MATERIALS:

No materials or supplies for the work shall be purchased by the Contractor or by any Subcontractor subject to any chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller. The Contractor warrants that he has good title to all materials and supplies used by him in the work, free from all liens, claims or encumbrances.

4. OBSERVATION AND TESTING:

All work performed and all workmanship, equipment and materials used in the construction shall be subject to Observation, examination and test, at any and all times during construction.

5. WEATHER CONDITIONS:

In the event of temporary suspension of work, or during inclement weather or whenever Renewal Wheat Ridge shall direct, the Contractor will, and will cause his Subcontractors to, protect carefully his and their work and materials against damage or injury from weather. If, in the opinion of Renewal Wheat Ridge, any work or materials shall have been damaged or injured by reason of failure on the part of the Contractor or any of his Subcontractors to so protect his work, such materials shall be removed and replaced at the expense of the Contractor.

6. EMERGENCY - PROTECTION OF LIFE AND PROPERTY:

In case of an emergency which threatens loss of injury or property, and/or safety of life, the Contractor is hereby permitted to act at his own discretion and in a diligent manner without prior instructions from the City to prevent the threatened loss or injury. He shall notify Renewal Wheat Ridge immediately thereafter. Any claim for compensation by the Contractor due to such extra work shall be promptly submitted in writing to Renewal Wheat Ridge for approval. The amount of any reimbursement claimed by the Contractor shall be determined in the manner provided in Article 9 of this Contract.

7. REPORTS, RECORDS, AND DATA:

The Contractor shall submit to Renewal Wheat Ridge such schedule of quantities and costs, progress schedules, payrolls, reports, estimates, records and other data as may be requested concerning work performed or to be performed under this Contract.

8. SUPERINTENDENCE BY CONTRACTOR:

At the site of the work, the Contractor shall employ a construction superintendent or foreman who shall have full authority to act for the Contractor. It is understood that such Representative shall be acceptable to Renewal Wheat Ridge and shall be one who can be continued in that capacity for the particular job involved unless he ceases to be on the Contractor's payroll. All directions given to such Representative in the Contractor's absence shall be as binding as if given to the Contractor.

9. CHANGES IN THE WORK:

Renewal Wheat Ridge may, at any time, by written order and without notice to the sureties, require the performance of extra work or make changes by altering, adding to, or deducting from the work. The amount of compensation to be paid to the Contractor shall be adjusted accordingly without invalidating the Contract and in accordance with whichever of the following plans Renewal Wheat Ridge elects: (1) a price agreed upon, (2) a price based on unit prices of the Contract; or (3) a price determined by adding fifteen percent (15%) to the reasonable cost of the extra work, addition, alteration, or deduction; provided however, that no additions to the Contract Price shall be agreed upon by, or shall be binding upon Renewal Wheat Ridge if the effect of said price increase is to increase the Contract amount beyond the amount of money appropriated by Renewal Wheat Ridge.

In giving instructions, the City may authorize minor changes in the work, not involving extra cost and not inconsistent with the purpose of the project. Otherwise, except in an emergency endangering life or property, no extra work or change shall be made unless in pursuance of a written approved Change Order or RFI response by Renewal Wheat Ridge.

10. TIME EXTENSIONS:

The Contractor shall, within seven (7) days from the beginning of any delay, notify Renewal Wheat Ridge, in writing, of the causes thereof and Renewal Wheat Ridge shall ascertain the facts, the extent of the delay and notify the Contractor of the decision in the matter.

The completion time shall be extended when delay in completion of the work by the Contractor is due to unforeseeable causes beyond his control and without his fault or negligence, including, but not restricted to, acts of God or the public enemy, acts or neglect of Renewal Wheat Ridge, acts of neglect of any other contractor, fires, floods, epidemics, quarantine restrictions, strikes, riots, civil commotions or freight embargoes. The time of completion of his work shall be extended by such time as shall be fixed by Renewal Wheat Ridge.

No such extension of time shall be deemed a waiver by Renewal Wheat Ridge of its right to terminate the Contract for abandonment or delay by the Contractor as herein provided or relieve the Contractor from full responsibility for

performance of his obligations hereunder. Renewal Wheat Ridge's liability for delay shall be limited to granting a time extension to the Contractor.

11. DEFECTIVE WORK:

The observation of the work by Renewal Wheat Ridge shall not relieve the Contractor of any of his obligations to fulfill his Contract as herein prescribed, and defective work shall be made good, and unsuitable materials may be rejected, notwithstanding that such work and material have been previously overlooked by Renewal Wheat Ridge representative(s) and accepted or estimated for payment or paid for. If the work or any part thereof shall be found defective or at any time before the final acceptance of the whole work, or the final payment therefore, the Contractor shall forthwith make good such defect in a manner satisfactory to Renewal Wheat Ridge and if any material brought upon the ground for use in the work, or selected for the same, shall be condemned by Renewal Wheat Ridge as unsuitable, the Contractor shall forthwith remove such materials from the vicinity of the work and shall replace, at his own expense, damaged or unsuitable materials with the new materials of satisfactory quality.

Neither the foregoing nor any provision of these Contract Documents, nor any special guarantee time limit, shall be held to limit the Contractor's liability for defects to less than the legal limit of liability in accordance with the law of the place of the construction.

The Contractor shall pay Renewal Wheat Ridge all expenses, losses, and damages as determined by Renewal Wheat Ridge incurred in consequence of any defect, omission, or mistake of the Contractor or his employees or the making good thereof.

12. UNEXPECTED UNDERGROUND STRUCTURES; CHANGE OF CONDITIONS:

Should the Contractor encounter underground structures at the site materially differing from those shown on the Plans or indicated in the Specifications, he shall immediately give notice to Renewal Wheat Ridge of such conditions before they are disturbed. Renewal Wheat Ridge will thereupon promptly investigate the conditions, and if it is determined that they materially differ from those shown on the Plans, may authorize changes to be made to the Plan and/or Specifications as may be necessary.

It is understood and agreed that the Contractor has considered in his bid all of the permanent and temporary utility appurtenances in their present or relocated position as shown on the plans and that additional compensation will not be allowed except for any unreasonable delays, or damage sustained by him due to any interference from the said utility appurtenances. Unreasonable delays shall constitute delays caused by a complete shut down of all operations. It is understood that utilities are not owned, operated or controlled or subject to control by Renewal Wheat Ridge. Relocations of facilities owned by said utilities are not a matter over which Renewal Wheat Ridge has control. The Contractor shall adjust his schedule in anticipation of such delays so that work in other areas may be completed away from the area of utility conflict.

The locations of all utilities shown on the Project plans should be considered approximate. It is therefore the responsibility of the Contractor to notify the appropriate utility and obtain more precise locations. No compensation will be made to the Contractor for any damage, delay or additional cost incurred as a result of failure to obtain utility locations.

Information on the Plans in the Contract Documents referring to the existence of utilities or other underground structures is not guaranteed to be correct or to be a complete representation of all existing data. Every effort has been made, however, to make this information complete and accurate on the basis of all data and information which could be procured by Renewal Wheat Ridge. The Contractor shall make his own examination and shall draw his own conclusions as to the underground facilities which will be encountered, and he shall have no claim for damages of any kind on account of any errors, inaccuracies or omission that may be found.

There shall be no adjustment in Contract Price based on changed site conditions. The Contractor is required hereby to make an on-site inspection and investigation, which includes determination of location of utilities and said and other natural conditions. Representations regarding site and soil conditions and utility locations are based on the best information available to the Owner and final determination as to both site and soil conditions and utility locations is left to the Contractor, without recourse to Renewal Wheat Ridge. Renewal Wheat Ridge shall allow reasonable and necessary access to the site to Contractor and his representatives to make such determination and site review.

13. CLAIMS FOR EXTRA COSTS:

No claim for extra work or cost shall be allowed unless the same was done in pursuance of written order of Renewal Wheat Ridge, as provided for in Article 9, and the claim was presented prior to the issuance of the final payment. When work is performed under the "reasonable cost" method as outlined in Article 9 of the General Conditions, the Contractor shall furnish satisfactory bills, payrolls and vouchers covering all items of cost, and when requested by Renewal Wheat Ridge, give Renewal Wheat Ridge access to accounts relating thereto.

**NO adjustments will be allowed for fuel cost of asphalt cement.**

14. RIGHT OF CITY TO TERMINATE CONTRACT:

If (1) the Contractor or any of his Subcontractors shall be adjudged bankrupt or (2) if he shall make a general assignment for the benefit of his creditors or (3) if a receiver shall be appointed of his property, or (4) if the work to be done under this Contract shall be abandoned, or (5) if this Contract or any part hereof shall be sublet, without the previous written consent of Renewal Wheat Ridge, or (6) if the Contract or any claim thereunder shall be assigned by the Contractor otherwise than as herein specified, or (7) at any time Renewal Wheat Ridge shall certify in writing that the rate of progress of the work or any part thereof is unsatisfactory or (8) that the work or any part thereof is unnecessarily or unreasonably delayed, or (9) that the Contractor, his subcontractors, agents or employees have violated any of the provisions of this Contract, or of the plans and specifications, or construction schedule, Renewal Wheat Ridge shall notify Contractor and the Surety, and shall be entitled immediately to terminate the Contract. The Surety shall have the right to take over and perform the Contract, provided, however, that if the Surety does not commence performance thereof within ten (10) days from the date of the mailing to such Surety of notice of termination, Renewal Wheat Ridge may take over the work and prosecute the same to completion by contract or by force account for the account and at the expense of the Contractor, and the Contractor and his Surety shall be liable to Renewal Wheat Ridge for any excess cost occasioned Renewal Wheat Ridge thereby, and in such event Renewal Wheat Ridge may take possession of and utilize in completing the work, such materials, machinery, appliances and plant as may be on the site of the work and necessary therefore. The Contractor, by signing this Contract, gives to Renewal Wheat Ridge in the event of default, right to use such aforesaid articles to the full extent which they could be used by the Contractor. Renewal Wheat Ridge shall not be liable to the Contractor for trespass or conversion.

All expenses charged under this article shall be deducted and paid for by Renewal Wheat Ridge out of money then due to become due the Contractor under this Contract or any part thereof, and in such account the City shall not be held to obtain the lowest figures for the work of completing the Contract or any part thereof or for insuring its proper completion, but all sums actually paid hereafter shall be charged to the Contractor and his Surety. In case the expenses so charged are less than the sum which would have been payable under this Contract if the same had been completed by the Contractor, Renewal Wheat Ridge shall be entitled to retain the difference and in case such expenses shall exceed the said sum, the Contractor and his Surety shall pay the amount of the excess to Renewal Wheat Ridge upon completion of the work without further demand being made therefore.

15. CONSTRUCTION SCHEDULE:

Before any work is begun, the Contractor shall provide to Renewal Wheat Ridge a written schedule detailing the order and manner of doing the work. Before the first partial payment is made, the Contractor shall deliver to Renewal Wheat Ridge an estimated construction progress schedule in form satisfactory to Renewal Wheat Ridge, showing the proposed dates of commencement and completion of each of the various subdivisions of work required under the Contract. The Contractor shall provide an updated schedule every two weeks.

16. PAYMENTS TO THE CONTRACTOR:

During the course of construction, the Contractor shall request payment of work actually performed during the preceding month. Renewal Wheat Ridge will once each month make a progress payment to the Contractor on the basis of an evaluation of the claim by Renewal Wheat Ridge as to amount of work done and that Renewal Wheat Ridge has received full value thereof. In accordance with House Bill 11-1115, the City shall retain five percent (5%) of the value of the completed work. Retainage shall be held until final completion and acceptance of all work, as part security for the fulfillment of the Contract by the Contractor. The amount of the progress payments shall be the balance not retained as aforesaid, after deducting all previous payments and all other sums to be kept or retained under the provisions of this Contract. The Contractor shall have no right to either terminate the Contract or to claim damages if he considers partial payments inadequate.

17. CERTIFICATE OF COMPLETION:

Upon completion of all work whatsoever required including completion of all known defective work, Renewal Wheat Ridge shall file a written certificate with the Contractor as to the entire amount of work performed and compensation earned by the Contractor including Extra Work and compensation therefore, and including the date of completion.

18. FINAL PAYMENT:

After the filing of the Certificate of Completion, Renewal Wheat Ridge shall pay to the Contractor in accordance with applicable Colorado laws (Article 38, Chapter 26, Section 101 Et. Seq. Colorado Revised Statutes) and upon authorization of funds disbursement by Renewal Wheat Ridge the amount therein stated, less all prior payments and advances whatsoever, to or for the Account of the Contractor. All prior estimates and payments including those relating to extra work shall be subject to correction by this payment.

19. PAYMENT WITHHELD:

Renewal Wheat Ridge, as a result of subsequent discovered evidence, may withhold or nullify the whole or a part of any payment to such extent as may be necessary to protect Renewal Wheat Ridge from loss on account of:

- (a) Defective work not remedied.
- (b) Claims filed or reasonable evidence indicating probable filing of claim.
- (c) Failure of the Contractor to make payments properly to Subcontractor or for material or labor, or to comply with laws relative thereto.
- (d) A reasonable doubt that the Contract can be completed for the balance then unpaid.
- (e) Damage to another Contractor.
- (f) Damage to the real or personal property of another and failure to repair or replace the same.

When the grounds for withholding payment have been corrected to the satisfaction of Renewal Wheat Ridge, Renewal Wheat Ridge shall proceed to process any amounts due.

20. FINAL PAYMENT TO TERMINATE LIABILITY OF CITY:

The acceptance by the Contractor of the last payment made as aforesaid under the provisions of Article 19 shall operate as and shall be a release to Renewal Wheat Ridge, its officers, or agents from all claims and liability to the Contractor, his vendors, laborers or Subcontractors for anything done or furnished for, relating to, or for any act or neglect of Renewal Wheat Ridge or of any persons relating to, or affecting the work, except the claim against Renewal Wheat Ridge for the remainder, if any there be, of the amounts kept or retained as provided in Article 16, 18 and 19 of these specifications. Said acceptance shall also operate as a general release of Renewal Wheat Ridge by the Contractor.

21. EFFECT OF CERTIFICATION AND PAYMENT:

Neither the certification nor payment made to the Contractor, not partial or entire use or occupancy of the work by Renewal Wheat Ridge shall be an acceptance of any work or materials not in accordance with the Contract. The making and acceptance of the final payment shall constitute a bar of all claims by the Contractor, except those previously made in writing and still unsettled.

22. GENERAL WARRANTY:

The Contractor shall guarantee the work against defective materials or workmanship for a period of one (1) year from the final completion date. Upon discovery of any defects including any damage to other work resulting, repair and replacement that is required, in the opinion of Renewal Wheat Ridge, shall be done immediately by the Contractor at the Contractor's expense. Should the Contractor fail to repair such defective material and/or workmanship, or to make replacement within five (5) days after written notice by Renewal Wheat Ridge, it is agreed that Renewal Wheat Ridge shall make such repairs and replacements and the actual cost of the required labor and materials shall be chargeable to and payable by the Contractor.

23. INSURANCE:

The Contractor shall maintain general liability and property damage insurance (the "Liability Policy") to protect the Contractor and Renewal Wheat Ridge from any and all claims for damages including but not limited to claims for property damage and bodily injury, including death, which may arise from operations under this Contract, including the

operations of subcontractors. The Liability Policy shall state that it is the primary insurance for such claims and shall not contain any "excess" or "other insurance" clauses which limit its application as the primary coverage for those claims. The Contractor shall be individually liable for any and all defects in the Liability Policy. The Liability Policy shall not be terminated or cancelled prior to the completion of this Contract without at least 30 days prior written notice to Renewal Wheat Ridge.

For bodily injury	\$500,000 each person/ \$500,000 each accident/ \$500,000 each disease
For property damage	\$1,000,000 for each occurrence
For automobile liability	\$1,000,000 combined single limit

In lieu of the foregoing, a single limit public liability policy for personal injury, property and/or vehicle damage will be accepted in the amount of \$2,000,000.00.

Such insurance shall be without prejudice to coverage otherwise existing, and shall name as additional insured, Renewal Wheat Ridge, its officers and employees.

Notwithstanding the naming of additional insured, the said policy shall protect each insured in the same manner as though a separate policy had been issued to each, but nothing herein shall operate to increase the insurer's liability as set forth elsewhere in the policy beyond the amount or amounts for which the insurer would have been liable if only one person or interest had been named as insured. A certificate evidencing such insurance, together with the proper endorsement, shall be filed, subject to approval as to the adequacy of protection.

Fire and Standard Extended Coverage Insurance -- The Contractor shall insure the work for 100 percent (100%) of the replacement value thereof for the life of the Contract against all loss or damage covered by the Standard Extended Coverage Insurance endorsement, including theft, vandalism, and malicious mischief, with an insurance company or companies acceptable to Renewal Wheat Ridge. The amount of the insurance may vary with the extent of the work completed but shall at all times be at least equal to the replaceable value of the amount paid for the work and materials installed and delivered plus the replaceable value of the work or materials furnished or delivered, but not yet paid for by Renewal Wheat Ridge. The insurance policy or policies shall be held jointly in the name of Renewal Wheat Ridge and Contractor as their respective interest may appear.

The issue, if any, shall be made adjustable with and payable to Renewal Wheat Ridge as a trustee for whom it may concern. Any payments made under such policy shall insure to the benefit of Renewal Wheat Ridge to the extent of balance for replacement of the loss suffered. The policy of insurance shall provide that it shall not be terminated or be canceled prior to the completion of this Contract. The Contractor shall be responsible for all damage to the work under construction, whether from fire, water, high winds or other cause during construction and until final completion and acceptance, even though partial payments or progress payments have been made under the Contract.

Workers' Compensation Insurance -- The Contractor shall provide workers' compensation insurance coverage for all persons employed on the work to be done under the Contract and assure that all workers will receive the compensation for compensable injuries.

Certificates of Insurance shall be attached to the executed Contract Documents and shall become a part of the Contract. These Certificates shall include a provision that thirty (30) days prior to insurance cancellation, written notice shall be given to Renewal Wheat Ridge.

Indemnification of Renewal Wheat Ridge -- Contractor hereby indemnifies and agrees to hold Renewal Wheat Ridge and its representatives and agents harmless for and on account of any act or omission in the completion and execution of the project specified herein, which indemnification shall extend to and include any damage of whatever sort or description, suffered by any person or entity, and shall include compensatory, punitive or special damages; and Contractor agrees to defend Renewal Wheat Ridge hereunder, at Contractor's sole expense and if he fails to do so, to thereafter indemnify Renewal Wheat Ridge, in addition to the above indemnification, for all court costs and attorney's fees incurred in any defense required to be undertaken by Renewal Wheat Ridge.

Notwithstanding the foregoing, nothing contained herein shall be deemed a waiver by Renewal Wheat Ridge of any of the protections afforded Renewal Wheat Ridge by virtue of the provisions of the Colorado Governmental Immunity Act (Colo. Rev. Stat. 24-10-101).

**24. RESPONSIBILITY FOR WORK; PRIORITY OF DOCUMENTS:**

- a) Debts and claims: The Contractor shall pay all debts for labor and materials contracted for by him on account of the work herein contemplated. The Contractor shall assume the defense of, and indemnify

and save harmless, Renewal Wheat Ridge and its officers and agents, from all claims relating to labor and materials furnished for the work; to infringement or alleged infringement of invention patents and patent rights used in, or in connection with the work or however originating from any of the work under this Contractor from conditions created thereby; to injuries to any persons or corporation caused by the acts or negligence of the Contractor or any of his agents or employees, or of any Subcontractor or any agents or employees of any Subcontractors, in doing the work or in consequence of any improper materials, implements or labor used therein; and shall fully reimburse and repay to Renewal Wheat Ridge all outlay and expense which Renewal Wheat Ridge may incur by reason of his failure to do so. The Contractor shall satisfy all suits and claims against Renewal Wheat Ridge arising from the violation of any law, ordinance, regulation, order, or decree on the part of the Contractor or any of his agents or employees, or any Subcontractor, or agent or employees of any Subcontractor; shall fully indemnify and save harmless Renewal Wheat Ridge against and from all cost, loss, and damage which the City may suffer by reason of his failure to do so; and shall fully reimburse and repay to Renewal Wheat Ridge all outlay and expense which Renewal Wheat Ridge may incur in making good any such default. The Contractor shall fully complete the work required to be done under this Contract, free from all liens and claims of any kind whatsoever.

- b) Plans and Specifications: It shall be the duty of the Contractor to carefully study and compare all drawings, specifications and instructions, visit the project site and acquaint himself with all conditions, and call to the attention of Renewal Wheat Ridge any discrepancy, error, omission or inconsistency that may exist in the plans or specifications, or between the plans and specifications, or any conflict between existing conditions and requirements of the plans and specifications. The execution or work in accordance with the plans, specifications or other instructions will be considered as evidence that the Contractor is thoroughly familiar with the true intent of the plans, specifications or other instructions. Change orders will not be issued to cover any cost, loss, or expense for additional labor or material required to rectify any discrepancies discovered or reported to Renewal Wheat Ridge after the execution of the work, unless the discrepancies are errors in structural, mechanical or electrical design as determined by Renewal Wheat Ridge.
  
- c) Priority of Documents: In case of discrepancy or inconsistency in the terms or conditions of any documents, the Contract Documents shall have the following order of priority such that a statement appearing in the document with the higher priority shall control any inconsistent statement in a document of lower priority. (The following are listed from the highest priority to the lowest priority):
  - 1. The Agreement
  - 2. Drawings and any notes appearing on the drawings
  - 3. Project Special Provisions
  - 4. Current edition of CDOT Standard Specifications for Road and Bridge Construction and all supplements thereto (English Version).
  - 5. General Provisions of the Contract for construction.

25. NOT USED

26. CARE AND PROTECTION OF PROPERTY:

The Contractor expressly undertakes at his own expense:

To assume full responsibility for the preservation of all public and private property, and use every precaution necessary to prevent damage thereto. If any direct or indirect damage is done to public or private property or on account of any act, omission, neglect or misconduct in the execution of the work on the part of the Contractor, such property shall be restored by the Contractor, at his expense, to a condition similar or equal to that existing before the damage was done, or he shall make good the damage in another manner acceptable to Renewal Wheat Ridge. No representations are made by or on behalf of Renewal Wheat Ridge concerning the conditions, locations or state of repair or existing sewers, drains, water mains and other underground structures;

To store his apparatus, materials, supplies, and equipment in such orderly fashion at the site of the work as will not unduly interfere with the progress of his work or the work on any other Contractor;

To provide suitable storage facilities for all materials which are liable to injury or exposure to weather, theft, breakage, or otherwise;

To place upon the work or any part thereof only such loads as are consistent with the safety of that portion of the work;

To clean up frequently all refuse, rubbish, scrap materials, and debris caused by his operations, to the end that at all times the site of the work shall present a neat, orderly and workmanlike appearance;

To fully and completely remove all utility markings generated by or as a result of the project from public rights-of-way utilizing a method that is least destructive to the existing improvements, and which method has been approved by the Renewal Wheat Ridge. Should the contractor propose to remove the markings with pressure washing, all pressure washing runoff and residue shall be contained and collected in accordance with Best Management Practices and Wheat Ridge Ordinance Chapter 20, Stormwater Quality and Control. Removal of all markings shall occur no later than twenty (20) days after completion of work.

To remove all surplus material, false-work, temporary structures, including foundations thereof, plant of any description and debris of every nature resulting from his operations, and to put the site in a neat, orderly condition before final payment;

To affect all cutting, fitting or patching of his work required to make the same to conform to the Plans and Specifications and, except with the consent of Renewal Wheat Ridge, not to cut or otherwise alter the work of any other Contractor. The Contractor shall not, except after written consent from proper parties enter or occupy with men, tools, materials or equipment, any privately owned land except on easements provided herein.

27. LANDS FOR WORK AND RIGHT-OF-WAY:

The City of Wheat Ridge will provide land, right-of-way and easements for all work specified in the Contract.

28. NO DAMAGES FOR CERTAIN DELAYS:

Renewal Wheat Ridge may delay the commencement of the work, or any part thereof, if Renewal Wheat Ridge shall deem it for the best interest of Renewal Wheat Ridge to do so. The Contractor shall have no claim for damages on account of such delay, but he shall be entitled to so much additional time in which to complete the whole or any portion of the work required under this Contract as Renewal Wheat Ridge shall certify in writing to be just. The Contractor shall have no claim for damages on account of any delay on the part of another Contractor.

29. REQUIRED PROVISIONS DEEMED INSERTED:

Each and every provision of law and clause required by law to be inserted in this Contract shall be deemed to be inserted herein, and the Contract shall be read and enforced as though it were included herein, and if through mistake or otherwise, any such provision is not inserted, or if not correctly inserted, then upon the applications of either party, the Contract shall forthwith be physically amended to make such insertion.

30. PROTECTION OF LIVES AND HEALTH:

The Contractor shall take all necessary precautions for the safety of employees of the work, and shall comply with all applicable provisions of Federal, State, and Municipal safety laws and building codes to prevent accidents or injury to persons on, about or adjacent to the premises where the work is being performed. He shall erect and properly maintain at all times, as required by the conditions and progress of the work, all necessary safeguards for the protection of workmen and the public and shall post danger signs warning against the hazards created by the construction such as protruding nails, hod hoists, well holes, elevator hatchways, scaffolding, window openings, stairways, and falling materials.

The Contractor shall comply with the Department of Labor Safety and Health Regulations for construction promulgated under the Occupational Safety and Health Act of 1970 (PL-91-596) and under Section 107 of the Contract Work Hours and Safety Standards Act (PL-19-54).

31. WAGE RATES:

The attention of the bidder is called to the requirements and provisions of all applicable laws and any amendments thereof or additions thereto as to the employment of labor, and to the schedule of any minimum wage rates established in compliance with such laws. If, after the award of the Contract, it becomes necessary to employ any person in a trade

or occupation not classified in the wage determinations, such person shall be paid at not less than such rate as shall be determined by the officials administering the laws mentioned above.

The Contract is subject to the applicable provisions of the Contract Work Hours Standards Act. Public Law 87-581, 87th Congress. No Contractor or Subcontractor contracting for any part of the contract work shall require or permit any laborer or mechanic to be employed on such work in excess of eight (8) hours in any calendar day or in excess of forty (40) hours in any work week unless such laborer or mechanic received compensation at a rate not less than one and one-half times his basic rate of pay for all hours worked in excess of eight (8) hours in any calendar day or in excess of forty (40) hours in such work week, as the case may be.

**32. EMPLOYMENT OF LABOR:**

The Contractor and each of his Subcontractors shall hire qualified workers for the project who are citizens of the United States or legal resident aliens with first preference being given, insofar as practicable, to those having served in the armed forces of the United States and having been honorably discharged or released from active duty therein.

The Contractor shall employ only competent persons to do the work, and whenever requested in writing by Renewal Wheat Ridge Representative, the Contractor shall discharge any person who commits trespass or is, in the opinion of Renewal Wheat Ridge Representative, disorderly, dangerous, unfaithful, insubordinate, incompetent or otherwise unsatisfactory.

**34. SANITARY PRECAUTIONS:**

Sanitary conveniences for the use of all persons employed on the work, properly screened from public observation, shall be provided in sufficient numbers in such manner and at such points as shall be approved. The contents shall be removed and disposed of in a satisfactory manner as the occasion requires. The Contractor shall rigorously prohibit the committal of nuisances within, on, or about the work. Any employees found violating these provisions shall be discharged and not again employed on the work without the written consent of Renewal Wheat Ridge Representative.

The Contractor shall supply sufficient drinking water from approved sources to all of his employees.

The sanitary convenience specified above shall be the obligation and responsibility of the General Contractor until the completion of the work. The facilities shall be made available to all other Contractors and Subcontractors.

**35. SALES AND USE TAXES:**

Do not include sales or use taxes in your bid. House Bill 1451 provides that Contractors shall make application with the Colorado State Department of Revenue for a tax exempt number which will be issued for the duration of the project. This tax exempt number is for State taxes only. Renewal Wheat Ridge will issue its own tax exempt number for local sales tax purposes. An affidavit must be signed by the General Contractor for such project before Renewal Wheat Ridge tax exempt number can be issued. Please be advised that a supplier is allowed by Colorado law (C.R.S. 39-26-703 (1)) to disallow any exemption because the seller is ultimately responsible for the tax. When a supplier exercises this right, please seek a refund of sales taxes paid from the appropriate jurisdiction (city or state).

**36. BUSINESS LICENSE:**

A business license is required for all Contractors performing work in the City of Wheat Ridge prior to beginning work. Please contact the City Sales Tax Division to obtain a license.

## CDOT STANDARD SPECIFICATIONS

All work required for the project shall be in accordance with the latest edition of the COLORADO DEPARTMENT OF TRANSPORTATION (CDOT), Standard Specifications for Road and Bridge Construction, 2011 Edition, unless modified by these Specifications.

### CDOT STANDARD SPECIAL PROVISIONS

The CDOT Standard Specifications are modified with the following CDOT Standard Special Provisions.

#### REVISION OF SECTIONS 101 AND 630 CONSTRUCTION ZONE TRAFFIC CONTROL

Sections 101 and 630 of the Standard Specifications are hereby revised for this project as follows:

In subsection 101.01 add the following:

MASH Manual for Assessing Safety Hardware

In subsection 630.01, delete the first paragraph and replace with the following:

**630.01** This work consists of furnishing, installing, moving, maintaining, and removing temporary traffic signs, advance warning arrow panels, flashing beacon (portable), barricades, channelizing devices, delineators, temporary traffic signals, mobile pavement marking zones, masking and unmasking existing signs in construction zones, and concrete barriers as required by the Manual on Uniform Traffic Control Devices for Streets and Highways and the Colorado Supplement thereto, in accordance with the Contract. Devices shall comply with the performance criteria contained in NCHRP Report 350 (only applicable for devices developed prior to 2011) or MASH (acceptable for all devices). Devices temporarily not in use shall, as a minimum, be removed from the shoulder area. Moving will include devices removed from the project and later returned to use.

In subsection 630.02, delete the second paragraph, and replace with the following:

Temporary sign support assembly shall be timber, perforated square metal tubing inserted into a larger base post or slip base or perforated metal U-channel with a slip base. The temporary sign support assembly shall conform to NCHRP (only applicable for sign support assemblies developed prior to 2011) or MASH (acceptable for all sign support assemblies), and AASHTO requirements regarding temporary sign supports during construction.

Subsection 630.02 shall include the following:

If a timber post is selected, it shall conform to the requirements of subsection 614.02.

In subsection 630.07(a), delete the first paragraph and replace with the following:

- (a) *Stackable Vertical Panels.* Stackable vertical panels shall comply with the crash test requirements contained in NCHRP Report 350 (only applicable for vertical panels developed prior to 2011) or MASH (acceptable for all vertical panels) and shall meet MUTCD requirements for vertical panels. Vertical panels shall be retroreflectorized with Type IV sheeting, in accordance with subsection 630.02. The stackable vertical panels shall have the following properties:

In subsection 630.07(b), delete the first paragraph and replace with the following:

- (b) *Stackable Tubular Markers.* Stackable tubular markers shall comply with the crash test requirements contained in NCHRP Report 350 (only applicable for stackable tubular markers developed prior to 2011) or MASH (acceptable for all stackable tubular markers) and shall conform to MUTCD requirements for Tubular Markers. The stackable tubular markers shall have the following properties:

In subsection 630.09, delete the second and third paragraphs, and replace with the following:

Work zone devices designated by FHWA as Category I, II, or III, shall comply with the performance criteria contained in NCHRP Report 350 (only applicable for devices developed prior to 2011) or MASH (acceptable for all devices). Devices designated as Category IV, including but not limited to portable or trailer-mounted devices such as flashing

arrow panels, temporary traffic signals, area lighting supports, and changeable message signs are not required to meet NCHRP 350 or MASH requirements.

Except for Category IV devices, the Contractor shall obtain and present to the Engineer the manufacturer's written NCHRP 350 (only applicable for devices developed prior to 2011) or MASH (acceptable for all devices) certification for each work zone device before it is first used on the project.

In subsection 630.10(a) (3) (iii), delete the third paragraph, and replace with the following:

Groups 1 and 2 shall each be equipped with a truck-mounted Advance Warning Flashing or Sequencing Arrow Panel (C Type), and a truck mounted impact attenuator. The impact attenuator shall be located on the rearmost vehicle of each group. A separate vehicle for this attenuator may be used. Each truck-mounted impact attenuator shall be certified by the manufacturer to be able to withstand a 62 MPH impact in accordance with NCHRP 350, Test Level 3 (only applicable for truck-mounted impact attenuators developed prior to 2011) or MASH, Test Level 3 (acceptable for all truck-mounted impact attenuators). The cone setting truck and the cone pickup truck shall not be the same vehicle.

In subsection 630.16, delete the 5th paragraph.

### **REVISION OF SECTION 103 COLORADO RESIDENT BID PREFERENCE**

Section 103 of the Standard Specifications is hereby revised for this project as follows:

Subsection 103.01 shall include the following:

- (a) *Colorado Resident Bid Preference.* A resident bidder shall be allowed a preference against a nonresident bidder from a state or foreign country equal to the preference given or required by the state or foreign country in which the nonresident bidder is a resident.

Resident bidder means:

- (1) A person, partnership, corporation, or joint venture which is authorized to transact business in Colorado and which maintains its principal place of business in Colorado: or,
- (2) A person, partnership, corporation, or joint venture which is authorized to transact business in Colorado, which maintains a place of business in Colorado, and which has paid Colorado unemployment compensation taxes in at least seventy-five percent of the eight quarters immediately prior to bidding on a construction contract for a public project.

To determine the resident bid preference status of a bidder, the bidder shall submit a completed Form 604 with the proposal. Failure to submit the residency Form with the proposal will be justification for and may result in the rejection of the proposal and forfeiture of the proposal guaranty.

The proposals will be treated as follows:

- (1) All proposals will be checked for accuracy by the Department.
- (2) The dollar amount of the checked proposal from nonresident bidders will be adjusted by a percentage equal to the percentage preference given or required by the state or foreign country of the bidder's residency. If the state or foreign country does not give or require a residency preference, no adjustment in the proposal dollar amount will be made.
- (3) Adjusted proposals from nonresident bidders will then be compared to proposals from resident bidders, and the bidder with the lowest total will be considered the apparent low bidder.
- (4) Should a nonresident bidder be the apparent low bidder, in accordance with paragraph (3) above, an award will be made on the basis of the original proposal, not the adjusted proposal.
- (5) The Department will proceed with its normal award procedure.

**REVISION OF SECTION 105  
CONTRACTOR SUBMITTALS  
TRAFFIC SIGNAL PEDESTAL POLE**

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

In subsection 105.02, Table 105-1, delete the Section No. 614 item Traffic Signal Pedestal Pole and replace it with the following:

Section No.	Description	Type	Contractor P.E. Seal Required?
614	Traffic Signal Pedestal Pole	Working Drawing	Y

**REVISION OF SECTION 105  
VIOLATION OF WORKING TIME LIMITATION**

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

Subsection 105.03 shall include the following:

If there is a violation of the working time limitations for traffic control as set forth in the special provisions, a written notice to stop work will be imposed on the Contractor at the start of the next working day. Work shall not resume until the Contractor assures the Engineer, in writing, that there will not be a reoccurrence of the working time violation. If more violations take place, the Engineer will notify the Contractor in writing that there will be a price reduction charge for each incident in accordance with this specification. This incident price reduction charge will be deducted from any money due the Contractor. This price reduction will not be considered a penalty but will be a price reduction for failure to perform traffic control in compliance with the Contract.

An incident is any violation up to 30 minutes in duration. Each 30 minutes or increment thereof will be considered as an incident. A price reduction will be assessed for each successive or cumulative 30 minute period in violation of the working time limitations, as determined by the Engineer. The price reduction for each incident will increase at a progressive rate starting with \$150 for the second incident and increasing to \$1200 for the fifth and subsequent incidents in accordance with the following schedule. A 15 minute grace period will be allowed at the beginning of the second incident on the project before the price reduction is applied. This 15 minute grace period applies only to the second incident.

The number of incident charges will be accumulative throughout the duration of the Contract.

**PRICE REDUCTION SCHEDULE**

Incident	Incident Rate	Total Price Reduction
1 <sup>st</sup>	Notice to Stop Work	----
2 <sup>nd</sup>	\$150	\$150
3 <sup>rd</sup>	300	450
4 <sup>th</sup>	600	1,050
5 <sup>th</sup>	1,200	2,250
6 <sup>th</sup>	1,200	3,450
Etc.	1,200	4,650
	Etc.	Etc.

**REVISION OF SECTION 105  
CONSTRUCTION SURVEYING**

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

In subsection 105.13, delete (a) and replace with the following:

- (a) *Contractor Surveying.* When the bid schedule contains pay item 625, Construction Surveying, the Department will provide control points and bench marks as described in the Contract. The Contractor shall furnish and set construction stakes establishing lines and grades in accordance with the provisions of Section 625. The Engineer may order extra surveying which will be paid for at a negotiated rate not to exceed \$150 per hour.

In subsection 105.13 (b), delete the sixth paragraph and replace with the following:

The Contractor shall be held responsible for the preservation of all stakes and marks, and if any are destroyed, disturbed or removed by the Contractor, subcontractors, or suppliers, the cost of replacing them will be charged against the Contractor and will be deducted from the payment for the work at a negotiated rate not to exceed \$150 per hour.

**REVISION OF SECTION 105  
DISPUTES AND CLAIMS FOR CONTRACT ADJUSTMENTS**

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

Delete subsections 105.22, 105.23 and 105.24 and replace with the following:

**105.22 Dispute Resolution.** Subsections 105.22, 105.23, and 105.24 detail the process through which the parties (CDOT and the Contractor) agree to resolve any issue that may result in a dispute. The intent of the process is to resolve issues early, efficiently, and as close to the project level as possible. Figure 105-1 in the standard special provisions outlines the process. Specified time frames may be extended by mutual agreement of the Engineer and the Contractor. In these subsections, when a time frame ends on a Saturday, Sunday or holiday, the time frame shall be extended to the next scheduled work day.

A dispute is a disagreement concerning contract price, time, interpretation of the Contract, or all three between the parties at the project level regarding or relating to the Contract. Disputes include, but are not limited to, any disagreement resulting from a delay, a change order, another written order, or an oral order from the Project Engineer, including any direction, instruction, interpretation, or determination by the Project Engineer, interpretations of the Contract provisions, plans, or specifications or the existence of alleged differing site conditions.

The term "merit" refers to the right of a party to recover on a claim or dispute, irrespective of quantum, based on the substance, elements, and grounds of that claim or dispute. The term "quantum" refers to the quantity or amount of compensation or time deserved when a claim or dispute is found to have merit.

Disputes from subcontractors, material suppliers, or any other entity not party to the Contract shall be submitted through the Contractor. Review of a pass-through dispute does not create privity of Contract between CDOT and the subcontractor.

If CDOT does not respond within the specified timelines, the Contractor may advance the dispute to the next level.

When the Project Engineer is a Consultant Project Engineer, actions, decisions, and determinations specified herein as made by the Project Engineer shall be made by the Resident Engineer.

The dispute resolution process set forth in this subsection shall be exhausted in its entirety prior to initiation of litigation or arbitration. Failure to comply with the requirements set forth in this subsection shall bar either party from any further administrative, equitable, or legal remedy. If a deadline is missed that does not prejudice either party, further relief shall be allowed.

All disputes and claims shall be submitted within 30 days of the date of the certified letter submitting the CDOT Form 96, Contractor Acceptance of Final Estimate, to the Contractor.

When a project has a landscape maintenance period, the Project Engineer will grant partial acceptance in accordance with subsection 105.21(a). This partial acceptance will be project acceptance of all the construction work performed prior to this partial acceptance. All disputes and claims related to the work in which this partial acceptance is granted shall be submitted within 30 days of the Project Engineer's partial acceptance.

Failure to provide notification of a dispute or claim within the time periods listed above releases the State of Colorado from all disputes and claims for which notice has not already been submitted in accordance with the Contract.

All disputes and claims seeking damages calculated on a Total Cost or Modified Total Cost basis will not be considered unless the party asserting such damages establishes all the legal requirements therefore, which include:

- (1) The nature of the particular losses makes it impossible or highly impractical to determine them with a reasonable degree of accuracy.
- (2) The Contractor's bid or estimate was realistic.
- (3) The Contractor's actual costs were reasonable.
- (4) The Contractor was not responsible for the cost overrun.

Should the Contractor's dispute use the Total Cost approach for calculating damages, damages will be determined by subtracting the contract amount from the total cost of performance. Should the Contractor's dispute use the Modified Total Cost approach for calculating damages, if the Contractor's bid was unrealistic in part, and/or some of its costs were unreasonable and/or some of its damages were caused by its own errors, those costs and damages will be deducted from the total cost of performance to arrive at the Modified Total Cost. The Total Cost or Modified Total Cost basis for calculating damages shall not be available for any disputes or claims seeking damages where the Contractor could have kept separate cost records at the time the dispute arose as described in subsection 105.22(a).

- (a) *Document Retention.* The Contractor shall keep full and complete records of the costs and additional time incurred for each dispute for a period of at least three years after the date of final payment or until dispute is resolved, whichever is more. The Contractor, subcontractors, and lower tier subcontractors shall provide adequate facilities, acceptable to the Engineer, for an audit during normal business hours. The Contractor shall permit the Engineer or Department auditor to examine and copy those records and all other records required by the Engineer to determine the facts or contentions involved in the dispute. The Contractor shall identify and segregate any documents or information that the Contractor considers particularly sensitive, such as confidential or proprietary information.

Throughout the dispute, the Contractor and the Project Engineer shall keep complete daily records of extra costs and time incurred, in accordance with the following procedures:

1. Daily records shall identify each operation affected, the specific locations where work is affected, and the potential effect to the project's schedule. Such records shall also reflect all labor, material, and equipment applicable to the affected operations.
  2. On the first work day of each week following the date of the written notice of dispute, the Contractor shall provide the Project Engineer with the daily records for the preceding week. If the Contractor's records indicate costs greater than those kept by the Department, the Project Engineer will meet with the Contractor and present his records to the Contractor at the meeting. The Contractor shall notify the Engineer in writing within three work days of any inaccuracies noted in, or disagreements with, the Department's records.
- (b) *Initial Dispute Resolution Process.* To initiate the dispute resolution process the Contractor shall provide a written notice of dispute to the Project Engineer upon the failure of the Parties to resolve the issue through negotiation. Disputes will not be considered unless the Contractor has first complied with specified issue resolution processes such as those specified in subsections 104.02, 106.05, 108.08(a), and 108.08(d).

The Contractor shall supplement the written notice of dispute within 15 days with a written Request for Equitable Adjustment (REA) providing the following:

- (1) The date of the dispute
- (2) The nature of the circumstances which caused the dispute
- (3) A statement explaining in detail the specific provisions of the Contract and any basis, legal or factual, which support the dispute.
- (4) If any, the estimated quantum, calculated in accordance with methods set forth in subsection 105.24(b)12., of the dispute with supporting documentation
- (5) An analysis of the progress schedule showing the schedule change or disruption if the Contractor is asserting a schedule change or disruption.

The Contractor shall submit as much information on the quantum and impacts to the Contract time as is reasonably available with the REA and then supplement the REA as additional information becomes available. If the dispute escalates to the DRB process the DRB shall not hear any issue or consider any information that was not contained in the Request for Equitable Adjustment and fully submitted to the Project Engineer and Resident Engineer during the 105.22 process.

- (c) *Project Engineer Review.* Within 15 days after receipt of the REA, the Project Engineer will meet with the Contractor to discuss the merits of the dispute. Within seven days after this meeting, the Project Engineer will issue a written decision on the merits of the dispute.

The Project Engineer will either deny the merits of the dispute or notify the Contractor that the dispute has merit. This determination will include a summary of the relevant facts, Contract provisions supporting the determination, and an evaluation of all scheduling issues that may be involved.

If the dispute is determined to have merit, the Contractor and the Project Engineer will determine the adjustment in payment, schedule, or both within 30 days. When a satisfactory adjustment is determined, it shall be implemented in accordance with subsections 106.05, 108.08, 109.04, 109.05 or 109.10 and the dispute is resolved.

If the Contractor accepts the Project Engineer's denial of the merits of the dispute, the dispute is resolved and no further action will be taken. If the Contractor does not respond in seven days, it will be assumed he has accepted the denial. If the Contractor rejects the Project Engineer's denial of the merits of the dispute or a satisfactory adjustment of payment or schedule cannot be agreed upon within 30 days, the Contractor may further pursue resolution of the dispute by providing written notice to the Resident Engineer within seven days, according to subsection 105.22(d).

- (d) *Resident Engineer Review.* Within seven days after receipt of the Contractor's written notice to the Resident Engineer of unsatisfactory resolution of the dispute, the Project Engineer and Resident Engineer will meet with the Contractor to discuss the dispute. Meetings shall continue weekly for a period of up to 30 days and shall include a Contractor's representative with decision authority above the project level.

If these meetings result in resolution of the dispute, the resolution will be implemented in accordance with subsections 108.08, 109.04, 109.05, or 109.10 and the dispute is resolved.

If these meetings do not result in a resolution or the participants mutually agree that they have reached an impasse, the dispute shall be presented to the Dispute Review Board in accordance with subsection 105.23.

**105.23 Dispute Review Board.** A Dispute Review Board (DRB) is an independent third party that will provide specialized expertise in technical areas and administration of construction contracts. The DRB will assist in and facilitate the timely and equitable resolution of disputes between CDOT and the Contractor in an effort to avoid animosity and construction delays, and to resolve disputes as close to the project level as possible. The DRB shall be established and operate as provided herein and shall serve as an independent and impartial board.

There are two types of DRBs: the "On Demand DRB" and the "Standing DRB". The DRB shall be an "On Demand DRB" unless a "Standing DRB" is specified in the Contract. An On Demand DRB shall be established only when the Project Engineer initiates a DRB review in accordance with subsection 105.23(a). A Standing DRB, when specified in the Contract, shall be established at the beginning of the project.

- (a) *Initiation of Dispute Review Board Review.* When a dispute has not been resolved in accordance with subsection 105.22, the Project Engineer will initiate the DRB review process within 5 days after the period described in subsection 105.22(d).

- (b) *Formation of Dispute Review Board.* DRBs will be established in accordance with the following procedures:

1. CDOT, in conjunction with the Colorado Contractors Association, will maintain a statewide list of suggested DRB candidates experienced in construction processes and the interpretation of contract documents and the resolution of construction disputes. The Board members shall be experienced in highway and transportation projects. After December 31, 2013 only individuals who have completed training (currently titled DRB Administration & Practice Training) through the Dispute Resolution Board Foundation or otherwise approved by CDOT can be a DRB member. When a DRB is formed, the parties shall execute the agreement set forth in subsection 105.23(l).
2. If the dispute has a value of \$250,000 or less, the On Demand DRB shall have one member. The Contractor and CDOT shall select the DRB member and execute the agreement within 30 days of initiating the DRB process. If the parties do not agree on the DRB member, each shall select five candidates. Each party shall numerically rank their list using a scale of one to five with one being their first choice and five being their last choice. If common candidates are listed, but the parties cannot agree, that common candidate with the lowest combined numerical ranking shall be selected. If there is no common candidate, the lists shall be combined and each party shall eliminate three candidates from the list. Each party shall then numerically rank the remaining candidates, with No. 1 being the first choice. The candidate with the lowest combined numerical ranking shall be the DRB member. The CDOT Project Engineer will be responsible for having all parties execute the agreement.

3. If the dispute has a value over \$250,000, the On Demand DRB shall have three members. The Contractor and CDOT shall each select a member and those two members shall select a third. Once the third member is approved the three members will nominate one of them to be the Chair and execute the agreement within 45 days of initiating the DRB process.
4. The Standing DRB shall always have three members. The Contractor and CDOT shall each select a member and those two members shall select a third member. Once the third member is approved the three members will nominate one of them to be the Chair. The Contractor and CDOT shall submit their proposed Standing DRB members within 5 days of execution of the Contract. The third member shall be selected within 15 days of execution of the Contract. Prior to construction starting the parties shall execute the Three Party Agreement. The CDOT Project Engineer will be responsible for having all parties execute the agreement. The Project Engineer will invite the Standing DRB members to the Preconstruction and any Partnering conferences.
5. DRB members shall not have been involved in the administration of the project under consideration. DRB candidates shall disclose to the parties the following relationships:
  - (1) Prior employment with either party
  - (2) Prior or current financial interests or ties to either party
  - (3) Prior or current professional relationships with either party
  - (4) Anything else that might bring into question the impartiality or independence of the DRB member
  - (5) Prior to agreeing to serve on a DRB, members shall notify all parties of any other CDOT DRB's they are serving or that they will be participating in another DRB.

If either party objects to the selection of a potential DRB member based on the disclosures of the potential member, that potential member shall not be placed on the Board.

6. There shall be no ex parte communications with the DRB at any time.
7. The service of a Board member may be terminated only by written agreement of both parties.
8. If a Board member resigns, is unable to serve, or is terminated, a new Board member shall be selected within four weeks in the same manner as the Board member who was removed was originally selected.

(c) *Additional Responsibilities of the Standing Disputes Review Board*

1. General. Within 120 days after the establishment of the Board, the Board shall meet at a mutually agreeable location to:
  - (1) Obtain copies of the Contract documents and Contractor's schedules for each of the Board members.
  - (2) Agree on the location of future meetings, which shall be reasonably close to the project site.
  - (3) Establish an address and telephone number for each Board member for the purposes of Board business.
2. Regular meetings. Regular meetings of the Board shall be held approximately every 120 to 180 days throughout the life of the Contract, except that this schedule may be modified to suit developments on the job as the work progresses. Regular meetings shall be attended by representatives of the Contractor and the Department.
3. The Board shall establish an agenda for each meeting which will cover all items that the Board considers necessary to keep it abreast of the project such as construction status, schedule, potential problems and solutions, status of past claims and disputes, and potential claims and disputes. Copies of each agenda shall be submitted to the Contractor and the Department at least seven days before the meeting date. Oral or written presentations or both shall be made by the Contractor and the Department as necessary to give the Board all the data the Board requires to perform its functions. The Board will prepare minutes of each meeting, circulate them to all participants for comments and approval, and issue revised minutes before the next meeting. As a part of each regular meeting, a field inspection trip of all active segments of the work at the project site may be made by the Board, the Contractor, and the Department.
4. Advisory Opinions
  - (1) Advisory opinions are typically used soon after the parties find they have a potential dispute and have conducted preliminary negotiations but before expenditure of additional resources and hardening their positions. Advisory opinions provide quick insight into the DRB's likely assessment of the dispute. This process is quick and may be entirely oral and does not prejudice the opportunity for a DRB hearing.

- (2) Both parties must agree to seek an advisory opinion and so notify the chairperson. The procedure for requesting and issuing advisory opinions should be discussed with the DRB at the first meeting with the parties.
- (3) The DRB may or may not issue a written opinion, but if a written advisory opinion is issued, it must be at the specific request of both parties.
- (4) The opinion is only advisory and does not require an acceptance or rejection by either party. If the dispute is not resolved and a hearing is held, the oral presentations and advisory opinion are completely disregarded and the DRB hearing procedure is followed.
- (5) Advisory opinions should be limited to merit issues only.

(d) *Arranging a Dispute Review Board Hearing.* When the Project Engineer initiates the DRB review process, the Project Engineer will:

1. Contact the Contractor and the DRB to coordinate an acceptable hearing date and time. The hearing shall be held at the Resident Engineer's office unless an alternative location is agreed to by both parties. Unless otherwise agreed to by both parties the DRB hearing will be held within 30 days after the DRB agreement is signed by the CDOT Chief Engineer.
2. Ensure DRB members have copies of all documents previously prepared by the Contractor and CDOT pertaining to the dispute, the DRB request, the Contract documents, and the special provisions at least two weeks before the hearing.

(e) *Pre-Hearing Submittal:* At least fifteen days prior to the hearing, CDOT and the Contractor shall submit by e-mail to the DRB Chairperson their parties pre-hearing position paper. The DRB Chairperson shall simultaneously distribute by e-mail the pre-hearing position papers to all parties and other DRB members, if any. At the same time, each party shall submit a copy of all its supporting documents to be used at the hearing to all DRB Members and the other party unless the parties have agreed to a common set of documents as discussed in #2 below. In this case, CDOT shall submit the common set of documents to the Board and the Contractor. The pre-hearing position paper shall contain the following:

1. A joint statement of the dispute, and the scope of the desired decision. The joint statement shall summarize in a few sentences the nature of the dispute. If the parties are unable to agree on the wording of the joint statement, each party's position paper shall contain both statements, and identify the party authoring each statement. The parties shall agree upon a joint statement at least 20 days prior to the hearing and submit it to the DRB or each party's independent statement shall be submitted to the DRB and the other party at least 20 days prior to the hearing.
2. The basis and justification for the party's position, with reference to specific contract language and other supporting documents for each element of the dispute. To minimize duplication and repetitiveness, the parties may identify a common set of documents that will be referred to by both parties and submit them in a separate package to the DRB. The engineer will provide a hard copy of the project plans and Project and Standard Special Provisions, if necessary, to the DRB. Other standard CDOT documents such as Standard Specifications and M&S Standards are available on the CDOT website.
  - (1) If any party contends that they are not necessary to the proceedings, the DRB shall determine that issue in the first instance. Should the DRB determine that a dispute does not involve a party, that party shall be relieved from participating in the DRB hearing and paying any further DRB costs.
  - (2) When the scope of the hearing includes quantum, the requesting party's position paper shall include full cost details, calculated in accordance with methods set forth in subsection 105.24(b)12. The Scope of the hearing will not include quantum if CDOT has ordered an audit and that audit has not been completed.
3. A list of proposed attendees at the hearing. In the event of any disagreement, the DRB shall make the final determination as to who attends the hearing.
4. A list of any intended experts including their qualifications and a summary of what their presentation will include and an estimate of the length of the presentation.

The number of copies, distribution requirements, and time for submittal shall be established by the DRB and communicated to the parties by the Chairperson.

A pre-hearing phone conference with all DRB members and the parties shall be conducted as soon as a hearing date is established but no later than 10 days prior to the hearing. The DRB Chairperson shall explain the specifics of how the hearing will be conducted including how the two parties will present their information to the DRB (Ex: Each party makes a full presentation of their position or presentations will be made on a "point by

point” basis with each party making a presentation only on an individual dispute issue before moving onto to the next issue). If the pre-hearing position papers and documents have been received by the Board prior to the conference call, the DRB Chairperson shall at this conference discuss the estimated hours of review and research activities for this dispute (such as time spent evaluating and preparing recommendations on specific issues presented to the DRB). If the pre-hearing position papers and documents have not been received by the Board prior to the conference call, another conference call will be scheduled during the initial conference call to discuss the estimated hours of review. Compensation for time agreed to in advance by the parties will be made at an agreed rate of \$125 per hour in accordance with subsection 105.23 (k) 2. Compensation for the phone conference time will also be made at an agreed to rate of \$125 per hour in accordance with subsection 105.23 (k) 2. The Engineer shall coordinate the phone conference.

- (f) *Dispute Review Board Hearing.* The DRB shall preside over a hearing. The chairperson shall control the hearing and conduct it as follows:
1. An employee of CDOT presents a brief description of the project and the status of construction on the project.
  2. The party that requested the DRB presents the dispute in detail as supported by previously submitted information and documentation in the pre-hearing position paper. No new information or disputes will be heard or addressed by the DRB.
  3. The other party presents its position in detail as supported by previously submitted information and documentation in the pre-hearing position paper. No new information or disputes will be heard or addressed by the DRB.
  4. Employees of each party are responsible for leading presentations at the DRB hearing.
  5. Attorneys shall not participate in the hearing unless the DRB specifically addresses an issue to them or unless agreed to by both parties. Should the parties disagree on attorney participation, the DRB shall decide on what, if any, participation will be permitted. Attorneys representing the parties are permitted to attend the hearing, provided their presence has been noted in the pre-hearing submittal.
  6. Either party may use experts. A party intending to offer an outside expert's analysis at the hearing shall disclose such intention in the pre-hearing position paper. The expert's name and a general statement of the area of the dispute that will be covered by his presentation shall be included in the disclosure. The other party may present an outside expert to address or respond to those issues that may be raised by the disclosing party's outside expert.
  7. If both parties approve, the DRB may retain an outside expert. The DRB chairperson shall include the cost of the outside expert in the DRB's regular invoice. CDOT and the Contractor shall equally bear the cost of the services of the outside expert employed by the DRB.
  8. Upon completion of their presentations and rebuttals, both parties and the DRB will be provided the opportunity to exchange questions and answers. All questions shall be directed to the chairperson first. Attendees may respond only when board members request a response.
  9. The DRB shall hear only those disputes identified in the written request for the DRB and the information contained in the pre-hearing submittals. The board shall not hear or address other disputes. If either party attempts to discuss a dispute other than those to be heard by the DRB or attempts to submit new information, the chairperson shall inform such party that the board shall not hear the issue and shall not accept any additional information. The DRB shall not hear any issue or consider any information that was not contained in the Request for Equitable Adjustment and fully submitted to the Project Engineer and Resident Engineer during the 105.22 process.
  10. If either party fails to timely deliver a position paper, the DRB may reschedule the hearing one time. On the final date and time established for the hearing, the DRB shall proceed with the hearing using the information that has been submitted.
  11. If a party fails to appear at the hearing, the DRB shall proceed as if all parties were in attendance.
- (g) *Dispute Review Board Recommendation.* The DRB shall issue a Recommendation in accordance with the following procedures:
1. The DRB shall not make a recommendation on the dispute at the meeting. Prior to the closure of the hearing, the DRB members and the Contractor and CDOT together will discuss the time needed for analysis and review of the dispute and the issuance of the DRB's recommendation. The maximum time shall be 30 days unless otherwise agreed to by both parties. At a minimum, the recommendation shall contain all the elements listed in Rule 35, Form of Award, of the Arbitration Regular Track Provisions listed at the end of subsection 105.24.

2. After the meeting has been closed, the DRB shall prepare a written Recommendation signed by each member of the DRB. In the case of a three member DRB, where one member dissents that member shall prepare a written dissent and sign it.
3. The chairperson shall transmit the signed Recommendation and any supporting documents to both parties.

(h) *Clarification and Reconsideration of Recommendation.* Either party may request clarification or reconsideration of a decision within ten days following receipt of the Recommendation. Within ten days after receiving the request, the DRB shall provide written clarification or reconsideration to both parties unless otherwise agreed to by both parties.

Requests for clarification or reconsideration shall be submitted in writing simultaneously to the DRB and to the other party.

The Board shall not accept requests for reconsideration that amount to a renewal of a prior argument or additional argument based on facts available at the time of the hearing. The Board shall not consider any documents or arguments which have not been made a part of the pre-hearing submittal other than clarification and data supporting previously submitted documentation.

Only one request for clarification or reconsideration per dispute from each party will be allowed.

(i) *Acceptance or Rejection of Recommendation.* CDOT and the Contractor shall submit their written acceptance or rejection of the Recommendation, in whole or in part, concurrently to the other party and to the DRB within 14 days after receipt of the Recommendation or following receipt of responses to requests for clarification or reconsideration.

If the parties accept the Recommendation or a discreet part thereof, it will be implemented in accordance with subsections 108.08, 109.04, 109.05, or 109.10 and the dispute is resolved.

If either party rejects the Recommendation in whole or in part, it shall give written explanation to the other party within 14 days after receiving the Recommendation. When the Recommendation is rejected in whole or in part by either party, the other party may either abandon the dispute or pursue a formal claim in accordance with subsection 105.24.

If either party fails to submit its written acceptance or rejection of the Dispute Board's recommendation, according to these specifications, such failure shall constitute that party's acceptance of the Board's recommendation.

(j) *Admissibility of Recommendation.* Recommendations of a DRB issued in accordance with subsection 105.23 are admissible in subsequent proceedings but shall be prefaced with the following paragraph:

This Recommendation may be taken under consideration with the understanding that:

1. The DRB Recommendation was a proceeding based on presentations by the parties.
2. No fact or expert witnesses presented sworn testimony or were subject to cross-examination.
3. The parties to the DRB were not provided with the right to any discovery, such as production of documents or depositions.
4. There is no record of the DRB hearing other than the Recommendation.

(k) *Cost and Payments.*

1. General Administrative Costs. The Contractor and the Department shall equally share the entire cost of the following to support the Board's operation:

- (1) Copies of Contract and other relevant documentation
- (2) Meeting space and facilities
- (3) Secretarial Services
- (4) Telephone
- (5) Mail
- (6) Reproduction
- (7) Filing

2. The Department and the Contractor shall bear the costs and expenses of the DRB equally. Each DRB board member shall be compensated at an agreed rate of \$1,200 per day if time spent on-site per meeting is greater than four hours. Each DRB board member shall be compensated at an agreed rate of \$800 per day if time spent on-site per meeting is less than or equal to four hours. The time spent traveling to and from each meeting shall be reimbursed at \$50 per hour if the travel distance is more than 50 miles. The agreed daily and travel

time rates shall be considered full compensation for on-site time, travel expenses, transportation, lodging, time for travel of more than 50 miles and incidentals for each day, or portion thereof that the DRB member is at an authorized DRB meeting. No additional compensation will be made for time spent by DRB members in review and research activities outside the official DRB meetings unless that time, (such as time spent evaluating and preparing recommendations on specific issues presented to the DRB), has been specifically agreed to in advance by the Department and Contractor. Time away from the project that has been specifically agreed to in advance by the parties will be compensated at an agreed rate of \$125 per hour. The agreed amount of \$125 per hour shall include all incidentals. Members serving on more than one DRB, regardless of the number of meetings per day, shall not be paid more than the all-inclusive rate per day or rate per hour for an individual project.

3. Payments to Board Members and General Administrative Costs. Each Board member shall submit an invoice to the Contractor for fees and applicable expenses incurred each month following a month in which the Board members participated in Board functions. Such invoices shall be in the format established by the Contractor and the Department. The Contractor shall submit to the Department copies of all invoices. No markups by the Contractor will be allowed on any DRB costs. The Department will split the cost by authorizing 50 percent payment on the next progress payment. The Contractor shall make all payments in full to Board members within seven calendar days after receiving payment from the Department for this work.

(l) *Dispute Review Board Three Party Agreement.*

**DISPUTE REVIEW BOARD  
THREE PARTY AGREEMENT  
COLORADO PROJECT NO. \_\_\_\_\_**

THIS THREE PARTY AGREEMENT, made as of the date signed by the Chief Engineer below, by and between: the Colorado Department of Transportation, hereinafter called the "Department"; and

\_\_\_\_\_  
\_\_\_\_\_  
hereinafter called the "Contractor"; and

\_\_\_\_\_  
\_\_\_\_\_  
and

\_\_\_\_\_  
hereinafter called the "Dispute Review Board" or "Board".

WHEREAS, the Department is now engaged in the construction of the \_\_\_\_\_  
[Project Name]

and

WHEREAS, the Contract provides for the establishment of a Board in accordance with subsections 105.22 and 105.23 of the specifications.

NOW, THEREFORE, it is hereby agreed:

**ARTICLE I  
DESCRIPTION OF WORK AND SERVICES**

The Department and the Contractor shall form a Board in accordance with this agreement and the provisions of subsection 105.23.

**ARTICLE II  
COMMITMENT ON PART OF THE PARTIES HERETO**

The parties hereto shall faithfully fulfill the requirements of subsection 105.23 and the requirements of this agreement.

ARTICLE III  
COMPENSATION

The parties shall share equally in the cost of the Board, including general administrative costs (meeting space and facilities, secretarial services, telephone, mail, reproduction, filing) and the member's individual fees. Reimbursement of the Contractor's share of the Board expenses for any reason is prohibited.

The Contractor shall make all payments in full to Board members. The Contractor will submit to the Department an itemized statement for all such payments, and the Department will split the cost by including 50 percent payment on the next progress payment. The Contractor and the Department will agree to accept invoiced costs prior to payment by the Contractor.

Board members shall keep all fee records pertaining to this agreement available for inspection by representatives of the Department and the Contractor for a period of three years after the termination of the Board members' services.

Payment to each Board member shall be at the fee rates established in subsection 105.23 and agreed to by each Board member, the Contractor, and the Department. In addition, reimbursement will be made for applicable expenses.

Each Board member shall submit an invoice to the Contractor for fees incurred each month following a month in which the members participated in Board functions. Such invoices shall be in the format established by the Contractor and the Department.

Payments shall be made to each Board member within 60 days after the Contractor and Department have received all the applicable billing data and verified the data submitted by that member. The Contractor shall make payment to the Board member within seven calendar days of receipt of payment from the Department.

ARTICLE IV  
ASSIGNMENT

Board members shall not assign any of the work to be performed by them under this agreement. Board members shall disclose any conflicts of interest including but not limited to any dealings with the either party in the previous five years other than serving as a Board member under other contracts.

ARTICLE V  
COMMENCEMENT AND TERMINATION OF SERVICES

The commencement of the services of the Board shall be in accordance with subsection 105.23 of the specifications and shall continue until all assigned disputes under the Contract which may require the Board's services have been heard and a Recommendation has been issued by the Board as specified in subsection 105.23. If a Board member is unable to fulfill his responsibilities for reasons specified in subsection 105.23(b)7, he shall be replaced as provided therein, and the Board shall fulfill its responsibilities as though there had been no change.

ARTICLE VI  
LEGAL RELATIONS

The parties hereto mutually agree that each Board member in performance of his duties on the Board is acting as an independent contractor and not as an employee of either the Department or the Contractor. Board members will guard their independence and avoid any communication about the substance of the dispute without both parties being present.

The Board members are absolved of any personal liability arising from the Recommendations of the Board. The parties agree that members of the dispute review board panel are acting as mediators for purposes of C.R.S. § 13-22-302(4) and, as such, the liability of any dispute review board member shall be limited to willful and wanton misconduct as provided for in C.R.S. § 13-22-305(6)

IN WITNESS HEREOF, the parties hereto have caused this agreement to be executed the day and year first written above.

BOARD MEMBER: \_\_\_\_\_.

BY: \_\_\_\_\_.

BOARD MEMBER: \_\_\_\_\_.

BY: \_\_\_\_\_.

BOARD MEMBER: \_\_\_\_\_.

BY: \_\_\_\_\_.

CONTRACTOR: \_\_\_\_\_.

BY: \_\_\_\_\_.

TITLE:

COLORADO DEPARTMENT OF TRANSPORTATION

BY: \_\_\_\_\_ Date: \_\_\_\_\_.

TITLE: CHIEF ENGINEER

**105.24 Claims for Unresolved Disputes.** The Contractor may file a claim only if the disputes resolution process described in subsections 105.22 and 105.23 has been exhausted without resolution of the dispute. Other methods of nonbinding dispute resolution, exclusive of arbitration and litigation, can be used if agreed to by both parties.

This subsection applies to any unresolved dispute or set of disputes between CDOT and the Contractor with an aggregate value of more than \$15,000. Unresolved disputes with an aggregate value of more than \$15,000 from subcontractors, materials suppliers or any other entity not a party to the Contract shall be submitted through the Contractor in accordance with this subsection as a pass-through claim. Review of a pass-through claim does not create privity of Contract between CDOT and any other entity.

Subsections 105.22, 105.23 and 105.24 provide both contractual alternative dispute resolution processes and constitute remedy-granting provisions pursuant to Colorado Revised Statutes which must be exhausted in their entirety.

Merit-binding arbitration or litigation proceedings must commence within 180-calendar days of the Chief Engineer's decision, absent written agreement otherwise by both parties.

The venue for all unresolved disputes with an aggregate value \$15,000 or less shall be the County Court for the City and County of Denver.

Non-binding Forms of alternative dispute resolution such as Mediation are available upon mutual agreement of the parties for all claims submitted in accordance with this subsection.

The cost of the non-binding ADR process shall be shared equally by both parties with each party bearing its own preparation costs. The type of nonbinding ADR process shall be agreed upon by the parties and shall be conducted within the State of Colorado at a mutually acceptable location. Participation in a nonbinding ADR process does not in any way waive the requirement that merit-binding arbitration or litigation proceedings must commence within 180-calendar days of the Chief Engineer's decision, absent written agreement otherwise by both parties.

(a) *Notice of Intent to File a Claim.*

Within 30 days after rejection of the Dispute Resolution Board's Recommendation issued in accordance with subsection 105.23, the Contractor shall provide the Region Transportation Director with a written notice of intent to file a claim. The Contractor shall also send a copy of this notice to the Resident Engineer. For the purpose of this subsection Region Transportation Director shall mean the Region Transportation Director or the Region Transportation Director's designated representative. CDOT will acknowledge in writing receipt of Notice of Intent within 7 days.

(b) *Claim Package Submission.* Within 60 days after submitting the notice of intent to file a claim, the Contractor shall submit five copies of a complete claim package representing the final position the Contractor wishes to have considered. All claims shall be in writing and in sufficient detail to enable the RTD to ascertain the basis and amount of claim. The claim package shall include all documents supporting the claim, regardless of whether such documents were provided previously to CDOT.

If requested by the Contractor the 60 day period may be extended by the RTD in writing prior to final acceptance. As a minimum, the following information shall accompany each claim.

1. A claim certification containing the following language, as appropriate:

A. For a direct claim by the Contractor:

<b>CONTRACTOR'S CLAIM CERTIFICATION</b>
Under penalty of law for perjury or falsification, the undersigned, _____ (name) _____, (title) _____, of _____ (company) _____, hereby certifies that the claim of \$ _____ for extra compensation and ____ Days additional time, made herein for work on this contract is true to the best of my knowledge and belief and supported under the Contract between the parties.
This claim package contains all available documents that support the claims made herein and I understand that no additional information, other than for clarification and data supporting previously submitted documentation, may be presented by me.
Dated _____ /s/ _____
Subscribed and sworn before me this ____ day of _____.
_____
<b>NOTARY PUBLIC</b>
My Commission Expires: _____

B. For a pass-through claim:

<b>PASS-THROUGH CLAIM CERTIFICATION</b>
Under penalty of law for perjury or falsification, the undersigned, _____ (name) _____, (title) _____, of _____ (company) _____, hereby certifies that the claim of \$ _____ for extra compensation and ____ Days additional time, made herein for work on this Project is true to the best of my knowledge and belief and supported under the contract between the parties.
This claim package contains all available documents that support the claims made herein and I understand that no additional information, other than for clarification and data supporting previously submitted documentation, may be presented by me.
Dated _____ /s/ _____
Subscribed and sworn before me this ____ day of _____.
_____
<b>NOTARY PUBLIC</b>
My Commission Expires: _____
Dated _____ /s/ _____
The Contractor certifies that the claim being passed through to CDOT is passed through in good faith and is accurate and complete to the best of my knowledge and belief.
Dated _____ /s/ _____
Subscribed and sworn before me this ____ day of _____.
_____
<b>NOTARY PUBLIC</b>
My Commission Expires: _____

2. A detailed factual statement of the claim for additional compensation, time, or both, providing all necessary dates, locations, and items of work affected by the claim. The Contractor's detailed factual statement shall expressly describe the basis of the claim and factual evidence supporting the claim. This requirement is not satisfied by simply incorporating into the claim package other documents that describe the basis of the claim and supporting factual evidence.
3. The date on which facts were discovered which gave rise to the claim.
4. The name, title, and activity of all known CDOT, Consultant, and other individuals who may be knowledgeable about facts giving rise to such claim.
5. The name, title, and activity of all known Contractor, subcontractor, supplier and other individuals who may be knowledgeable about facts giving rise to such claim.
6. The specific provisions of the Contract, which support the claim and a statement of the reasons why such provisions support the claim.

7. If the claim relates to a decision of the Project Engineer, which the Contract leaves to the Project Engineer's discretion, the Contractor shall set out in detail all facts supporting its position relating to the decision of the Project Engineer.
8. The identification of any documents and the substance of all oral communications that support the claim.
9. Copies of all known documents that support the claim.
10. The Dispute Review Board Recommendation.
11. If an extension of contract time is sought, the documents required by subsection 108.08(d).
12. If additional compensation is sought, the exact amount sought and a breakdown of that amount into the following categories:
  - A. These categories represent the only costs that are recoverable by the Contractor. All other costs or categories of costs are not recoverable:
    - (1) Actual wages and benefits, including FICA, paid for additional labor
    - (2) Costs for additional bond, insurance and tax
    - (3) Increased costs for materials
    - (4) Equipment costs calculated in accordance with subsection 109.04(c) for Contractor owned equipment and based on certified invoice costs for rented equipment
    - (5) Costs of extended job site overhead
    - (6) Salaried employees assigned to the project
    - (7) Claims from subcontractors and suppliers at any level (the same level of detail as specified herein is required for all such claims)
    - (8) An additional 16 percent will be added to the total of items (1) through (7) as compensation for items for which no specific allowance is provided, including profit and home office overhead.
    - (9) Interest shall be paid in accordance with CRS 5-12-102 beginning from the date of the Notice of Intent to File Claim
  - B. In adjustment for the costs as allowed above, the Department will have no liability for the following items of damages or expense:
    - (1) Profit in excess of that provided in 12.A.(8) above
    - (2) Loss of Profit
    - (3) Additional cost of labor inefficiencies in excess of that provided in A. above
    - (4) Home office overhead in excess of that provided in A. above
    - (5) Consequential damages, including but not limited to loss of bonding capacity, loss of bidding opportunities, and insolvency
    - (6) Indirect costs or expenses of any nature in excess of that provided in A. above
    - (7) Attorney's fees, claim preparation fees, and expert fees
- (c) *Audit.* An audit may be performed by the Department for any dispute or claim, and is mandatory for all disputes and claims with amounts greater than \$250,000. All audits will be complete within 60 days of receipt of the complete claim package, provided the Contractor allows the auditors reasonable and timely access to the Contractor's books and records. For all claims with amounts greater than \$250,000 the Contractor shall submit a copy of certified claim package directly to the CDOT Audit Unit at the following address:

Division of Audit  
4201 E. Arkansas Ave  
Denver, Co. 80222

- (d) *Region Transportation Director Decision.* When the Contractor properly files a claim, the RTD will review the claim and render a written decision to the Contractor to either affirm or deny the claim, in whole or in part, in accordance with the following procedure.

The RTD may consolidate all related claims on a project and issue one decision, provided that consolidation does not extend the time period within which the RTD is to render a decision. Consolidation of unrelated claims will not be made.

The RTD will render a written decision to the Contractor within 60 days after the receipt of the claim package or receipt of the audit whichever is later. In rendering the decision, the RTD: (1) will review the information in the

Contractor's claim; (2) will conduct a hearing if requested by either party; and (3) may consider any other information available in rendering a decision.

The RTD will assemble and maintain a claim record comprised of all information physically submitted by the Contractor in support of the claim and all other discoverable information considered by the RTD in reaching a decision. Once the RTD assembles the claim record, the submission and consideration of additional information, other than for clarification and data supporting previously submitted documentation, at any subsequent level of review by anyone, will not be permitted.

The RTD will provide a copy of the claim record and the written decision to the Contractor describing the information considered by the RTD in reaching a decision and the basis for that decision. If the RTD fails to render a written decision within the 60 day period, or within any extended time period as agreed to by both parties, the Contractor shall either: (1) accept this as a denial of the claim, or (2) appeal the claim to the Chief Engineer, as described in this subsection.

If the Contractor accepts the RTD decision, the provisions of the decision shall be implemented in accordance with subsections 108.08, 109.04, 109.05, or 109.10 and the claim is resolved.

If the Contractor disagrees with the RTD decision, the Contractor shall either: (1) accept the RTD decision as final, or (2) file a written appeal to the Chief Engineer within 30 days from the receipt of the RTD decision. The Contractor hereby agrees that if a written appeal is not properly filed, the RTD decision is final.

- (e) *Chief Engineer Decision.* When a claim is appealed, the RTD will provide the claim record to the Chief Engineer. Within 15 days of the appeal either party may submit a written request for a hearing with the Chief Engineer or duly authorized Headquarters delegates. The Chief Engineer or a duly authorized Headquarters delegate will review the claim and render a decision to affirm, overrule, or modify the RTD decision in accordance with the following.

The Contractor's written appeal to the Chief Engineer will be made a part of the claim record.

The Chief Engineer will render a written decision within 60 days after receiving the written appeal. The Chief Engineer will not consider any information that was not previously made a part of the claim record, other than clarification and data supporting previously submitted documentation.

The Contractor shall have 30 days to accept or reject the Chief Engineer's decision. The Contractor shall notify the Chief Engineer of its acceptance or rejection in writing.

If the Contractor accepts the Chief Engineer's decision, the provisions of the decision will be implemented in accordance with subsections 108.08, 109.04, 109.05, or 109.10 and the claim is resolved.

If the Contractor disagrees with the Chief Engineer's decision, the Contractor shall either (1) pursue an alternative dispute resolution process in accordance with this specification or (2) initiate litigation or merit binding arbitration in accordance with subsection 105.24(f).

If the Chief Engineer does not issue a decision as required, the Contractor may immediately initiate either litigation or merit binding arbitration in accordance with subsection 105.24(f).

For the convenience of the parties to the Contract it is mutually agreed by the parties that any merit binding arbitration or De Novo litigation shall be brought within 180-calendar days from the date of the Chief Engineer's decision. The parties understand and agree that the Contractor's failure to bring suit within the time period provided, shall be a complete bar to any such claims or causes of action.

- (f) *De Novo Litigation or Merit Binding Arbitration.* If the Contractor disagrees with the Chief Engineer's decision, the Contractor may initiate de novo litigation or merit binding arbitration to finally resolve the claim that the Contractor submitted to CDOT, depending on which option was selected by the Contractor on Form 1378 which shall be submitted at the preconstruction conference. Such litigation or arbitration shall be strictly limited to those claims that were previously submitted and decided in the contractual dispute and claims processes outlined herein. This does not preclude the joining in one litigation or arbitration of multiple claims from the same project provided that each claim has gone through the dispute and claim process specified in subsections 105.22 through 105.24. The parties may agree, in writing, at any time, to pursue some other form of alternative dispute resolution.

Any offer made by the Contractor or the Department at any stage of the claims process, as set forth in this subsection, shall be deemed an offer of settlement pursuant to Colorado Rule of Evidence 408 and therefore inadmissible in any litigation or arbitration.

If the Contractor selected litigation, then de novo litigation shall proceed in accordance with the Colorado Rules of Civil Procedure and the proper venue is the Colorado State District Court in and for the City and County of Denver, unless both parties agree to the use of arbitration.

If the Contractor selected merit binding arbitration, or if both parties subsequently agreed to merit binding arbitration, arbitration shall be governed by the modified version of AAA's Construction Industry Arbitration Rules which follow. Pursuant to the modified arbitration rules (R35 through R39), the arbitrators shall issue a binding decision with regard to entitlement and a non-binding decision with regard to quantum. If either party disagrees with the decision on quantum, the disagreeing party may seek a trial de novo in Denver District Court with regard to quantum only.

**AMERICAN ARBITRATION ASSOCIATION CONSTRUCTION INDUSTRY ARBITRATION RULES MODIFIED FOR USE WITH CDOT SPECIFICATION SUBSECTION 105.24**

**REGULAR TRACK PROCEDURES**

**R-1. Agreement of Parties**

- (a) The parties shall be deemed to have made these rules a part of their Contract. These rules and any amendments shall apply in the form in effect at the time the administrative requirements are met for a demand for arbitration. The parties, by written agreement, may vary the procedures set forth in these rules. After appointment of the arbitrator, such modifications may be made only with the consent of the arbitrator.
- (b) Unless the parties determine otherwise, the Fast Track Procedures shall apply in any case in which aggregate claims do not exceed \$75,000, exclusive of interest and arbitration fees and costs. Parties may also agree to use these procedures in larger cases. Unless the parties agree otherwise, these procedures will not apply in cases involving more than two parties except for pass-through claims. The Fast Track Procedures shall be applied as described in Sections F-1 through F-13 of these rules, in addition to any other portion of these rules that is not in conflict with the Fast Track Procedures.
- (c) Unless the parties agree otherwise, the Procedures for Large, Complex Construction Disputes shall apply to all cases in which the disclosed aggregate claims of any party is at least \$500,000, exclusive of claimed interest, arbitration fees and costs. Parties may also agree to use these procedures in cases involving claims under \$500,000, or in nonmonetary cases. The Procedures for Large, Complex Construction Disputes shall be applied as described in Sections L-1 through L-4 of these rules, in addition to any other portion of these rules that is not in conflict with the Procedures for Large, Complex Construction Disputes.
- (d) All other cases shall be administered in accordance with Sections R-1 through R-45 of these rules.

**R-2. Independent Arbitration Provider and Delegation of Duties**

When parties agree to arbitrate under these rules, or when they provide for arbitration by an independent third-party (Arbitration Provider) and arbitration is initiated under these rules, they thereby authorize the Arbitration Provider to administer the arbitration. The authority and duties of the Arbitration Provider are prescribed in the parties' Contract and in these rules, and may be carried out through such of the Arbitration Provider's representatives as it may direct. The Arbitration Provider will assign the administration of an arbitration to its Denver office

**R-3. Initiation of Arbitration**

Arbitration shall be initiated in the following manner.

- (a) The Contractor shall, within 30 days after the Chief Engineer issues a decision, submit to the Chief Engineer written notice of its intention to arbitrate (the "demand"). The demand shall indicate the appropriate qualifications for the arbitrator(s) to be appointed to hear the arbitration.
- (b) CDOT may file an answering statement with the Contractor within 15 days after receiving the demand. If a counterclaim is asserted, it shall contain a statement setting forth the nature of the counterclaim, the amount involved, if any, and the remedy sought.
- (c) The Chief Engineer shall retain an Arbitration Provider, such as the American Arbitration Association, which will administer an arbitration pursuant to these Rules, except to the extent that such rules conflict with the specifications, in which case the specifications shall control.

(d) The Arbitration Provider shall confirm its retention to the parties.

#### **R-4. Consolidation or Joinder**

If the parties' agreement or the law provides for consolidation or joinder of related arbitrations, all involved parties will endeavor to agree on a process to effectuate the consolidation or joinder.

If they are unable to agree, the Arbitration Provider shall directly appoint a single arbitrator for the limited purpose of deciding whether related arbitrations should be consolidated or joined and, if so, establishing a fair and appropriate process for consolidation or joinder. The Arbitration Provider may take reasonable administrative action to accomplish the consolidation or joinder as directed by the arbitrator.

#### **R-5. Appointment of Arbitrator**

An arbitrator shall be appointed in the following manner:

- (a) Immediately after the Arbitration Provider is retained, the Arbitration Provider shall send simultaneously to each party to the dispute an identical list of 10 names of potential arbitrators. The parties are encouraged to agree to an arbitrator from the submitted list and to advise the AAA of their agreement. Absent agreement of the parties, the arbitrator shall not have served as the mediator in the mediation phase of the instant proceeding.
- (b) If the parties cannot agree to arbitrator(s), each party to the dispute shall have 15 calendar days from the transmittal date in which to strike names objected to, number the remaining names in order of preference, and return the list to the Arbitration Provider. If a party does not return the list within the time specified, all persons named therein shall be deemed acceptable. From among the persons who have been approved on both lists, and in accordance with the designated order of mutual preference, the Arbitration Provider shall invite an arbitrator to serve.
- (c) Unless both parties agree otherwise one arbitrator shall be used for claims less than \$250,000 and three arbitrators shall be used for claims \$250,000 and greater. Within 15 calendar days from the date of the appointment of the last arbitrator, the Arbitration Provider shall appoint a chairperson.
- (d) The entire claim record will be made available to the arbitrators by the Chief Engineer within 15 calendar days from the date of the appointment of the last arbitrator.

#### **R-6. Changes of Claim**

The arbitrator(s) will not consider any information that was not previously made a part of the claim record as transmitted by the Chief Engineer, other than clarification and data supporting previously submitted documentation.

#### **R-7. Disclosure**

- (a) Any person appointed or to be appointed as an arbitrator shall disclose to the Arbitration Provider any circumstance likely to give rise to justifiable doubt as to the arbitrator's impartiality or independence, including any bias or any interest in the result of the arbitration or any relationship with the parties or their representatives. Such obligation shall remain in effect throughout the arbitration.
- (b) Upon receipt of such information from the arbitrator or another source, the Arbitration Provider shall communicate the information to the parties and, if it deems it appropriate to do so, to the arbitrator and others.
- (c) In order to encourage disclosure by arbitrators, disclosure of information pursuant to this Section R-6 is not to be construed as an indication that the arbitrator considers that the disclosed circumstances are likely to affect impartiality or independence.
- (d) In no case shall an arbitrator be employed by, affiliated with, or have consultative or business connection with the claimant Contractor or CDOT. An arbitrator shall not have assisted either in the evaluation, preparation, or presentation of the claim case either for the Contractor or the Department or have rendered an opinion on the merits of the claim for either party, and shall not do so during the proceedings of arbitration.

## **R-8. Disqualification of Arbitrator**

- (a) Any arbitrator shall be impartial and independent and shall perform his or her duties with diligence and in good faith, and shall be subject to disqualification for: (i) partiality or lack of independence, (ii) inability or refusal to perform his or her duties with diligence and in good faith; and/or (iii) any grounds for disqualification provided by applicable law.
- (b) Upon objection of a party to the continued service of an arbitrator, or on its own initiative, the Arbitration Provider shall determine whether the arbitrator should be disqualified under the grounds set out above, and shall inform the parties of its decision, which decision shall be conclusive.

## **R-9. Communication with Arbitrator**

No party and no one acting on behalf of any party shall communicate *ex parte* with an arbitrator or a candidate for arbitrator concerning the arbitration.

## **R-10. Vacancies**

- (a) If for any reason an arbitrator is unable to perform the duties of the office, the Arbitration Provider may, on proof satisfactory to it, declare the office vacant. Vacancies shall be filled in accordance with the applicable provisions of these rules.
- (b) In the event of a vacancy in a panel of neutral arbitrators after the hearings have commenced, the remaining arbitrator or arbitrators may continue with the hearing and determination of the controversy, unless the parties agree otherwise.
- (c) In the event of the appointment of a substitute arbitrator, the panel of arbitrators shall determine in its sole discretion whether it is necessary to repeat all or part of any prior hearings.

## **R-11. Jurisdiction**

- (a) The arbitrator shall have the power to rule on his or her own jurisdiction, including any objections with respect to the existence, scope or validity of the arbitration agreement.
- (b) The arbitrator shall have the power to determine the existence or validity of a contract of which an arbitration clause forms a part. Such an arbitration clause shall be treated as an agreement independent of the other terms of the contract. A decision by the arbitrator that the contract is null and void shall not for that reason alone render invalid the arbitration clause.
- (c) A party must object to the jurisdiction of the arbitrator or to the arbitrability of a claim or counterclaim no later than 15 days after the Arbitration Provider confirms its retention to the parties. The arbitrator may rule on such objections as a preliminary matter or as part of the final award.

## **R-12. Administrative Conference**

At the request of any party or upon the Arbitration Provider's own initiative, the Arbitration Provider may conduct an administrative conference, in person or by telephone, with the parties and/or their representatives. The conference may address such issues as arbitrator selection, potential exchange of information, a timetable for hearings and any other administrative matters.

## **R-13. Preliminary Hearing**

- (a) At the request of any party or at the discretion of the arbitrator or the Arbitration Provider, the arbitrator may schedule as soon as practicable a preliminary hearing with the parties and/or their representatives. The preliminary hearing may be conducted by telephone at the arbitrator's discretion.
- (b) During the preliminary hearing, the parties and the arbitrator should discuss the future conduct of the case, including clarification of the issues and claims, a schedule for the hearings and any other preliminary matters.

#### **R-14. Exchange of Information**

- (a) At the request of any party or at the discretion of the arbitrator, consistent with the expedited nature of arbitration, the arbitrator may direct: (i) the production of documents and other information; (ii) short depositions, particularly with regard to experts; and/or (iii) the identification of any witnesses to be called.
- (b) At least five business days prior to the hearing, the parties shall exchange copies of all exhibits they intend to submit at the hearing.
- (c) The arbitrator is authorized to resolve any disputes concerning the exchange of information.
- (d) Additional discovery may be ordered by the arbitrator in extraordinary cases when the demands of justice require it.

#### **R-15. Date, Time, and Place of Hearing**

- (a) The arbitrator shall set the date, time, and place for each hearing and/or conference. The parties shall respond to requests for hearing dates in a timely manner, be cooperative in scheduling the earliest practicable date, and adhere to the established hearing schedule.
- (b) The parties may mutually agree on the locale where the arbitration is to be held. Absent such agreement, the arbitration shall be held in the City and County of Denver.
- (c) The Arbitration Provider shall send a notice of hearing to the parties at least ten calendar days in advance of the hearing date, unless otherwise agreed by the parties.

#### **R-16. Attendance at Hearings**

The arbitrator and the Arbitration Provider shall maintain the privacy of the hearings unless the law provides to the contrary. Any person having a direct interest in the arbitration is entitled to attend hearings. The arbitrator shall otherwise have the power to require the exclusion of any witness, other than a party or other essential person, during the testimony of any other witness. It shall be discretionary with the arbitrator to determine the propriety of the attendance of any person other than a party and its representative.

#### **R-17. Representation**

Any party may be represented by counsel or other authorized representative. A party intending to be so represented shall notify the other party and the Arbitration Provider of the name and address of the representative at least three calendar days prior to the date set for the hearing at which that person is first to appear.

#### **R-18. Oaths**

Before proceeding with the first hearing, each arbitrator may take an oath of office and, if required by law, shall do so. The arbitrator may require witnesses to testify under oath administered by any duly qualified person and, if it is required by law or requested by any party, shall do so.

#### **R-19. Stenographic Record**

Any party desiring a stenographic record shall make arrangements directly with a stenographer and shall notify the other parties of these arrangements at least three days in advance of the hearing. The requesting party or parties shall pay the cost of the record. If the transcript is agreed by the parties, or determined by the arbitrator to be the official record of the proceeding, it must be provided to the arbitrator and made available to the other parties for inspection, at a date, time, and place determined by the arbitrator.

#### **R-20. Interpreters**

Any party wishing an interpreter shall make all arrangements directly with the interpreter and shall assume the costs of the service.

## **R-21. Postponements**

The arbitrator for good cause shown may postpone any hearing upon agreement of the parties, upon request of a party, or upon the arbitrator's own initiative.

## **R-22. Arbitration in the Absence of a Party or Representative**

Unless the law provides to the contrary, the arbitration may proceed in the absence of any party or representative who, after due notice, fails to be present or fails to obtain a postponement. An award shall not be made solely on the default of a party. The arbitrator shall require the party who is present to submit such evidence as the arbitrator may require for the making of an award.

## **R-23. Conduct of Proceedings**

- (a) The Contractor shall present evidence to support its claim. CDOT shall then present evidence supporting its defense. Witnesses for each party shall also submit to questions from the arbitrator and the adverse party. The arbitrator has the discretion to vary this procedure; provided that the parties are treated with equality and that each party has the right to be heard and is given a fair opportunity to present its case.
- (b) The arbitrator, exercising his or her discretion, shall conduct the proceedings with a view to expediting the resolution of the dispute and may direct the order of proof, bifurcate proceedings, and direct the parties to focus their presentations on issues the decision of which could dispose of all or part of the case. The arbitrator shall entertain motions, including motions that dispose of all or part of a claim or that may expedite the proceedings, and may also make preliminary rulings and enter interlocutory orders.
- (c) The parties may agree to waive oral hearings in any case.

## **R-24. Evidence**

- (a) The arbitrators shall consider all written information available in the claim record and all oral presentations in support of that record by the Contractor and CDOT. Conformity to legal rules of evidence shall not be necessary.
- (b) The arbitrators shall not consider any written documents or arguments which have not previously been made a part of the claim record, other than clarification and data supporting previously submitted documentation. The arbitrators shall not consider an increase in the amount of the claim, or any new claims.
- (c) The arbitrator shall determine the admissibility, relevance, and materiality of any evidence offered. The arbitrator may request offers of proof and may reject evidence deemed by the arbitrator to be cumulative, unreliable, unnecessary, or of slight value compared to the time and expense involved. All evidence shall be taken in the presence of all of the arbitrators and all of the parties, except where: (i) any of the parties is absent, in default, or has waived the right to be present, or (ii) the parties and the arbitrators agree otherwise.
- (d) The arbitrator shall take into account applicable principles of legal privilege, such as those involving the confidentiality of communications between a lawyer and client.
- (e) An arbitrator or other person authorized by law to subpoena witnesses or documents may do so upon the request of any party or independently.

## **R-25. Evidence by Affidavit and Post-hearing Filing of Documents or Other Evidence**

- (a) The arbitrator may receive and consider the evidence of witnesses by declaration or affidavit, but shall give it only such weight as the arbitrator deems it entitled to after consideration of any objection made to its admission.
- (b) If the parties agree or the arbitrator directs that documents or other evidence be submitted to the arbitrator after the hearing, the documents or other evidence, unless otherwise agreed by the parties and the arbitrator, shall be filed with the Arbitration Provider for transmission to the arbitrator. All parties shall be afforded an opportunity to examine and respond to such documents or other evidence.

## **R-26. Inspection or Investigation**

An arbitrator finding it necessary to make an inspection or investigation in connection with the arbitration shall direct the Arbitration Provider to so advise the parties. The arbitrator shall set the date and time and the Arbitration Provider shall notify the parties. Any party who so desires may be present at such an inspection or investigation. In the event that one or all parties are not present at the inspection or investigation, the arbitrator shall make an oral or written report to the parties and afford them an opportunity to comment.

## **R-27. Interim Measures**

- (a) The arbitrator may take whatever interim measures he or she deems necessary, including injunctive relief and measures for the protection or conservation of property and disposition of perishable goods.
- (b) A request for interim measures addressed by a party to a judicial authority shall not be deemed incompatible with the agreement to arbitrate or a waiver of the right to arbitrate.

## **R-28. Closing of Hearing**

When satisfied that the presentation of the parties is complete, the arbitrator shall declare the hearing closed.

If documents or responses are to be filed as provided in Section R-24, or if briefs are to be filed, the hearing shall be declared closed as of the final date set by the arbitrator for the receipt of documents, responses, or briefs. The time limit within which the arbitrator is required to make the award shall commence to run, in the absence of other agreements by the parties and the arbitrator, upon the closing of the hearing.

## **R-29. Reopening of Hearing**

The hearing may be reopened on the arbitrator's initiative, or by direction of the arbitrator upon application of a party, at any time before the award is made. If reopening the hearing would prevent the making of the award within the specific time agreed to by the parties in the arbitration agreement, the matter may not be reopened unless the parties agree to an extension of time. When no specific date is fixed by agreement of the parties, the arbitrator shall have 15 calendar days from the closing of the reopened hearing within which to make an award.

## **R-30. Waiver of Rules**

Any party who proceeds with the arbitration after knowledge that any provision or requirement of these rules has not been complied with and who fails to state an objection in writing shall be deemed to have waived the right to object.

## **R-31. Extensions of Time**

The parties may modify any period of time by mutual agreement. The Arbitration Provider or the arbitrator may for good cause extend any period of time established by these rules, except the time for making the award. The Arbitration Provider shall notify the parties of any extension.

## **R-32. Serving of Notice**

- (a) Any papers, notices, or process necessary or proper for the initiation or continuation of an arbitration under these rules; for any court action in connection therewith, or for the entry of judgment on any award made under these rules, may be served on a party by mail addressed to the party or its representative at the last known address or by personal service, in or outside the state where the arbitration is to be held, provided that reasonable opportunity to be heard with regard thereto has been granted to the party.
- (b) The Arbitration Provider, the arbitrator and the parties may also use overnight delivery, electronic facsimile transmission (fax), or electronic mail (email) to give the notices required by these rules.
- (c) Unless otherwise instructed by the Arbitration Provider or by the arbitrator, any documents submitted by any party to the Arbitration Provider or to the arbitrator shall simultaneously be provided to the other party or parties to the arbitration.

### **R-33. Majority Decision**

When the panel consists of more than one arbitrator, unless required by law or by the arbitration agreement, a majority of the arbitrators must make all decisions.

### **R-34. Time of Award**

The award shall be made promptly by the arbitrator and, unless otherwise agreed by the parties or specified by law, no later than 30 calendar days from the date of closing the hearing, or, if oral hearings have been waived, from the date of the Arbitration Provider's transmittal of the final statements and proofs to the arbitrator.

### **R-35. Form of Award**

After complete review of the facts associated with the claim, the arbitrators shall render a written explanation of their decision. When three arbitrators are used, and only two arbitrators agree then the award shall be signed by the two arbitrators. The arbitrator's decision shall include:

- (a) A summary of the issues and factual evidence presented by the Contractor and the Department concerning the claim;
- (b) Decisions concerning the validity of the claim;
- (c) Decisions concerning the value of the claim as to cost impacts if the claim is determined to be valid;
- (d) The contractual and factual bases supporting the decisions made including an explanation as to why each and every position was accepted or rejected;
- (e) Detailed and supportable calculations which support any decisions.

### **R-36. Scope of Award**

- (a) The arbitrator may grant any remedy or relief that the arbitrator deems just and equitable and within the scope of the agreement of the parties, including, but not limited to, equitable relief and specific performance of a contract.
- (b) In addition to the final award, the arbitrator may make other decisions, including interim, interlocutory, or partial rulings, orders, and awards. (c) The award of the arbitrator may include interest at the statutory rate and from such date as the arbitrator may deem appropriate.

### **R-37. Delivery of Award to Parties**

Parties shall accept as notice and delivery of the award the placing of the award or a true copy thereof in the mail addressed to the parties or their representatives at the last known address, personal or electronic service of the award, or the filing of the award in any other manner that is permitted by law.

### **R-38. Modification of Award**

Within 10 calendar days after the transmittal of an award, the arbitrator on his or her initiative, or any party, upon notice to the other parties, may request that the arbitrator correct any clerical, typographical, technical or computational errors in the award. The arbitrator is not empowered to redetermine the merits of any claim already decided.

If the modification request is made by a party, the other parties shall be given 10 calendar days to respond to the request. The arbitrator shall dispose of the request within 25 calendar days after transmittal by the Arbitration Provider to the arbitrator of the request.

If applicable law provides a different procedural time frame, that procedure shall be followed.

### **R-39. Appeal of Award**

Appeal of the arbitrators' decision concerning the merit of the claim is governed by the Colorado Uniform Arbitration Act, C.R.S. §§ 13-22-202 to -230. Either party may appeal the arbitrator's decision on the value of the claim to the Colorado State District Court in and for the City and County of Denver for trial de novo.

### **R-40. Release of Documents for Judicial Proceedings**

The Arbitration Provider shall, upon the written request of a party, furnish to the party, at its expense, certified copies of any papers in the Arbitration Provider's possession that may be required in judicial proceedings relating to the arbitration.

### **R-41. Applications to Court and Exclusion of Liability**

- (a) No judicial proceeding by a party relating to the subject matter of the arbitration shall be deemed a waiver of the party's right to arbitrate.
- (b) Neither the Arbitration Provider nor any arbitrator in a proceeding under these rules is a necessary or proper party in judicial proceedings relating to the arbitration.
- (c) Parties to these rules shall be deemed to have consented that judgment upon the arbitration award may be entered in any federal or state court having jurisdiction thereof.
- (d) Parties to an arbitration under these rules shall be deemed to have consented that neither the Arbitration Provider nor any arbitrator shall be liable to any party in any action for damages or injunctive relief for any act or omission in connection with any arbitration under these rules.

### **R-42. Administrative Fees**

The Arbitration Provider shall prescribe filing and other administrative fees and service charges to compensate it for the cost of providing administrative services. The fees in effect when the fee or charge is incurred shall be applicable. Such fees and charges shall be borne equally by the parties.

The Arbitration Provider may, in the event of extreme hardship on the part of any party, defer or reduce the administrative fees.

### **R-43. Expenses**

The expenses of witnesses for either side shall be paid by the party producing such witnesses. All other expenses of the arbitration, including required travel and other expenses of the arbitrator, Arbitration Provider representatives, and any witness and the cost of any proof produced at the direct request of the arbitrator, shall be borne equally by the parties.

### **R-44. Neutral Arbitrator's Compensation**

Arbitrators shall be compensated a rate consistent with the arbitrator's stated rate of compensation.

If there is disagreement concerning the terms of compensation, an appropriate rate shall be established with the arbitrator by the Arbitration Provider and confirmed to the parties.

Such compensation shall be borne equally by the parties.

### **R-45. Deposits**

The Arbitration Provider may require the parties to deposit in advance of any hearings such sums of money as it deems necessary to cover the expense of the arbitration, including the arbitrator's fee, if any, and shall render an accounting to the parties and return any unexpended balance at the conclusion of the case.

## **R-46. Interpretation and Application of Rules**

The arbitrator shall interpret and apply these rules insofar as they relate to the arbitrator's powers and duties by a majority vote. If that is not possible, either an arbitrator or a party may refer the question to the Arbitration Provider for final decision. All other rules shall be interpreted and applied by the Arbitration Provider.

## **R-45. Suspension for Nonpayment**

If arbitrator compensation or administrative charges have not been paid in full, the Arbitration Provider may so inform the parties in order that the parties may advance the required payment. If such payments are not made, the arbitrator may order the suspension or termination of the proceedings. If no arbitrator has yet been appointed, the Arbitration Provider may suspend the proceedings.

## **FAST TRACK PROCEDURES**

### **F-1. Limitations on Extensions**

In the absence of extraordinary circumstances, the Arbitration Provider or the arbitrator may grant a party no more than one seven-day extension of the time in which to respond to the demand for arbitration or counterclaim as provided in Section R-3.

### **F-2. Changes of Claim**

The arbitrator will not consider any information that was not previously made a part of the claim record as transmitted by the Chief Engineer, other than clarification and data supporting previously submitted documentation

### **F-3. Serving of Notice**

In addition to notice provided above, the parties shall also accept notice by telephone. Telephonic notices by the Arbitration Provider shall subsequently be confirmed in writing to the parties. Should there be a failure to confirm in writing any such oral notice, the proceeding shall nevertheless be valid if notice has, in fact, been given by telephone.

### **F-4. Appointment and Qualification of Arbitrator**

Immediately after the retention of the Arbitration Provider, the Arbitration Provider will simultaneously submit to each party a listing and biographical information from its panel of arbitrators knowledgeable in construction who are available for service in Fast Track cases. The parties are encouraged to agree to an arbitrator from this list, and to advise the Arbitration Provider of their agreement, or any factual objections to any of the listed arbitrators, within 7 calendar days of the transmission of the list. The Arbitration Provider will appoint the agreed-upon arbitrator, or in the event the parties cannot agree on an arbitrator, will designate the arbitrator from among those names not stricken for factual objections.

The parties will be given notice by the Arbitration Provider of the appointment of the arbitrator, who shall be subject to disqualification for the reasons specified above. Within the time period established by the Arbitration Provider, the parties shall notify the Arbitration Provider of any objection to the arbitrator appointed. Any objection by a party to the arbitrator shall be for cause and shall be confirmed in writing to the Arbitration Provider with a copy to the other party or parties.

### **F-5. Preliminary Telephone Conference**

Unless otherwise agreed by the parties and the arbitrator, as promptly as practicable after the appointment of the arbitrator, a preliminary telephone conference shall be held among the parties or their attorneys or representatives, and the arbitrator.

### **F-6. Exchange of Exhibits**

At least 2 business days prior to the hearing, the parties shall exchange copies of all exhibits they intend to submit at the hearing. The arbitrator is authorized to resolve any disputes concerning the exchange of exhibits.

## **F-7. Discovery**

There shall be no discovery, except as provided in Section F-4 or as ordered by the arbitrator in extraordinary cases when the demands of justice require it.

## **F-8. Date, Time, and Place of Hearing**

The arbitrator shall set the date and time, and place of the hearing, to be scheduled to take place within 30 calendar days of confirmation of the arbitrator's appointment. The Arbitration Provider will notify the parties in advance of the hearing date. All hearings shall be held within the City and County of Denver.

## **F-9. The Hearing**

- (a) Generally, the hearing shall not exceed 1 day. Each party shall have equal opportunity to submit its proofs and complete its case. The arbitrator shall determine the order of the hearing, and may require further submission of documents within two business days after the hearing. For good cause shown, the arbitrator may schedule 1 additional hearing day within 7 business days after the initial day of hearing.
- (b) Generally, there will be no stenographic record. Any party desiring a stenographic record may arrange for one pursuant to the provisions above.

## **F-10. Time of Award**

Unless otherwise agreed by the parties, the award shall be rendered not later than 14 calendar days from the date of the closing of the hearing or, if oral hearings have been waived, from the date of the Arbitration Provider's transmittal of the final statements and proofs to the arbitrator.

## **F-11. Time Standards**

The arbitration shall be completed by settlement or award within 60 calendar days of confirmation of the arbitrator's appointment, unless all parties and the arbitrator agree otherwise or the arbitrator extends this time in extraordinary cases when the demands of justice require it.

## **F-12. Arbitrator's Compensation**

Arbitrators will receive compensation at a rate to be suggested by the Arbitration Provider regional office.

## **PROCEDURES FOR LARGE, COMPLEX CONSTRUCTION DISPUTES**

### **L-1. Large, Complex Construction Disputes**

The procedures for large, complex construction disputes shall apply to any claim with a value exceeding \$500,000 or as agreed to by the parties.

### **L-2. Administrative Conference**

Prior to the dissemination of a list of potential arbitrators, the Arbitration Provider shall, unless the parties agree otherwise, conduct an administrative conference with the parties and/or their attorneys or other representatives by conference call. The conference call will take place within 14 days after the retention of the Arbitration Provider. In the event the parties are unable to agree on a mutually acceptable time for the conference, the Arbitration Provider may contact the parties individually to discuss the issues contemplated herein. Such administrative conference shall be conducted for the following purposes and for such additional purposes as the parties or the Arbitration Provider may deem appropriate:

- (a) To obtain additional information about the nature and magnitude of the dispute and the anticipated length of hearing and scheduling;
- (b) To discuss the views of the parties about the technical and other qualifications of the arbitrators;

- (c) To obtain conflicts statements from the parties; and
- (d) To consider, with the parties, whether mediation or other non-adjudicative methods of dispute resolution might be appropriate.

### **L-3. Arbitrators**

- (a) Large, Complex Construction Cases shall be heard and determined by three arbitrators.
- (b) The Arbitration Provider shall appoint arbitrator(s) in the manner provided in the Regular Construction Industry Arbitration Rules.

### **L-4. Preliminary Hearing**

As promptly as practicable after the selection of the arbitrator(s), a preliminary hearing shall be held among the parties and/or their attorneys or other representatives and the arbitrator(s). Unless the parties agree otherwise, the preliminary hearing will be conducted by telephone conference call rather than in person.

At the preliminary hearing the matters to be considered shall include, without limitation:

- (a) Service of a detailed statement of claims, damages and defenses, a statement of the issues asserted by each party and positions with respect thereto, and any legal authorities the parties may wish to bring to the attention of the arbitrator(s);
- (b) Stipulations to uncontested facts;
- (c) The extent to which discovery shall be conducted;
- (d) Exchange and premarking of those documents which each party believes may be offered at the hearing;
- (e) The identification and availability of witnesses, including experts, and such matters with respect to witnesses including their biographies and expected testimony as may be appropriate;
- (f) Whether, and the extent to which, any sworn statements and/or depositions may be introduced;
- (g) The extent to which hearings will proceed on consecutive days;
- (h) Whether a stenographic or other official record of the proceedings shall be maintained;
- (i) The possibility of utilizing mediation or other non-adjudicative methods of dispute resolution; and
- (j) The procedure for the issuance of subpoenas.

By agreement of the parties and/or order of the arbitrator(s), the pre-hearing activities and the hearing procedures that will govern the arbitration will be memorialized in a Scheduling and Procedure Order.

### **L-5. Management of Proceedings**

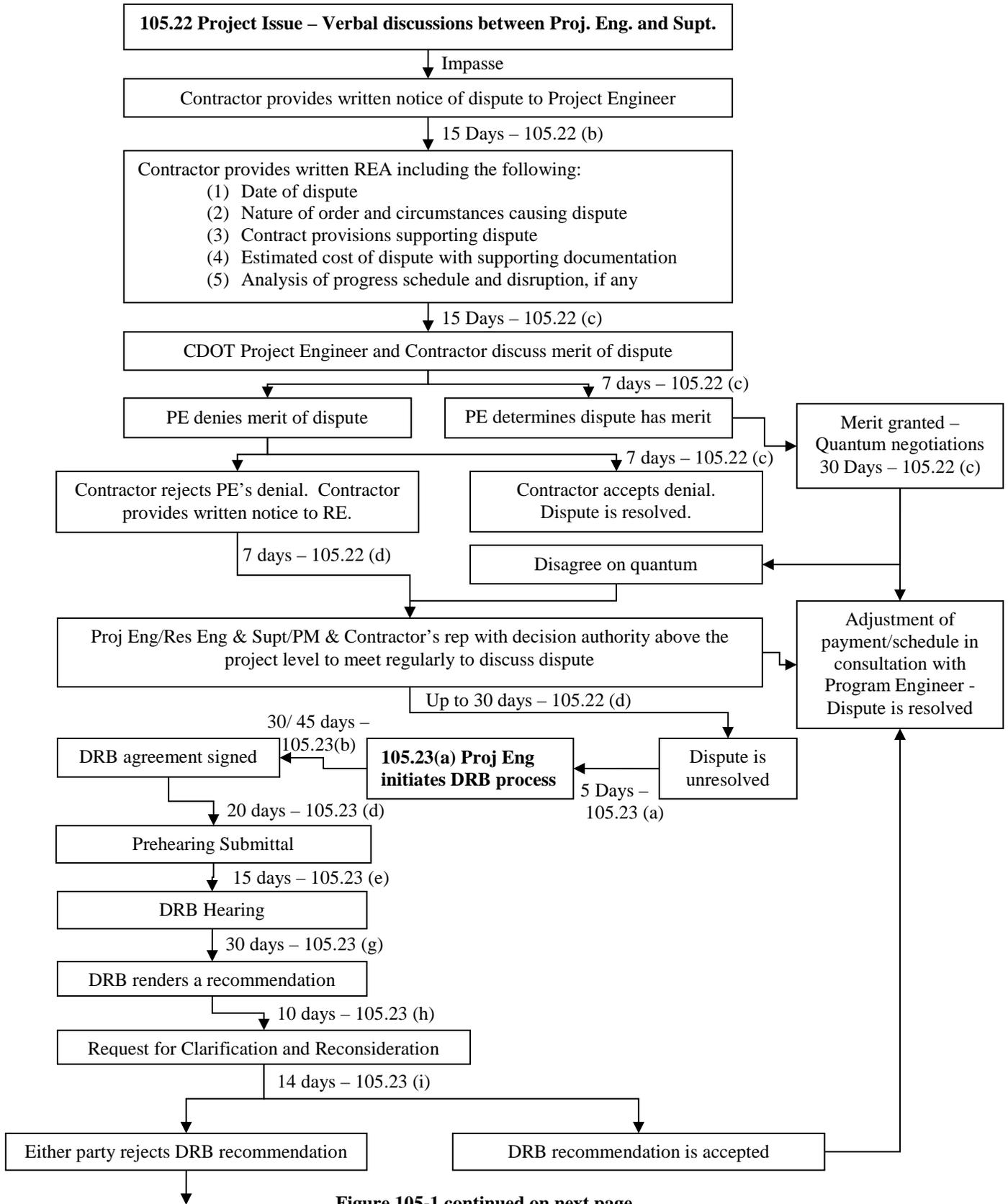
- (a) Arbitrator(s) shall take such steps as they may deem necessary or desirable to avoid delay and to achieve a just, speedy and cost-effective resolution of Large, Complex Construction Cases.
- (b) Parties shall cooperate in the exchange of documents, exhibits and information within such party's control if the arbitrator(s) consider such production to be consistent with the goal of achieving a just, speedy and cost effective resolution of a Large, Complex Construction Case.
- (c) The parties may conduct such discovery as may be agreed to by all the parties provided, however, that the arbitrator(s) may place such limitations on the conduct of such discovery as the arbitrator(s) shall deem appropriate.

If the parties cannot agree on production of document and other information, the arbitrator(s), consistent with the expedited nature of arbitration, may establish the extent of the discovery.

- (d) At the discretion of the arbitrator(s), upon good cause shown and consistent with the expedited nature of arbitration, the arbitrator(s) may order depositions of, or the propounding of interrogatories to such persons who may possess information determined by the arbitrator(s) to be necessary to a determination of the matter.
- (e) The parties shall exchange copies of all exhibits they intend to submit at the hearing 10 business days prior to the hearing unless the arbitrator(s) determine otherwise.
- (f) The exchange of information pursuant to this rule, as agreed by the parties and/or directed by the arbitrator(s), shall be included within the Scheduling and Procedure Order.
- (g) The arbitrator is authorized to resolve any disputes concerning the exchange of information.
- (h) Generally hearings will be scheduled on consecutive days or in blocks of consecutive days in order to maximize efficiency and minimize costs.

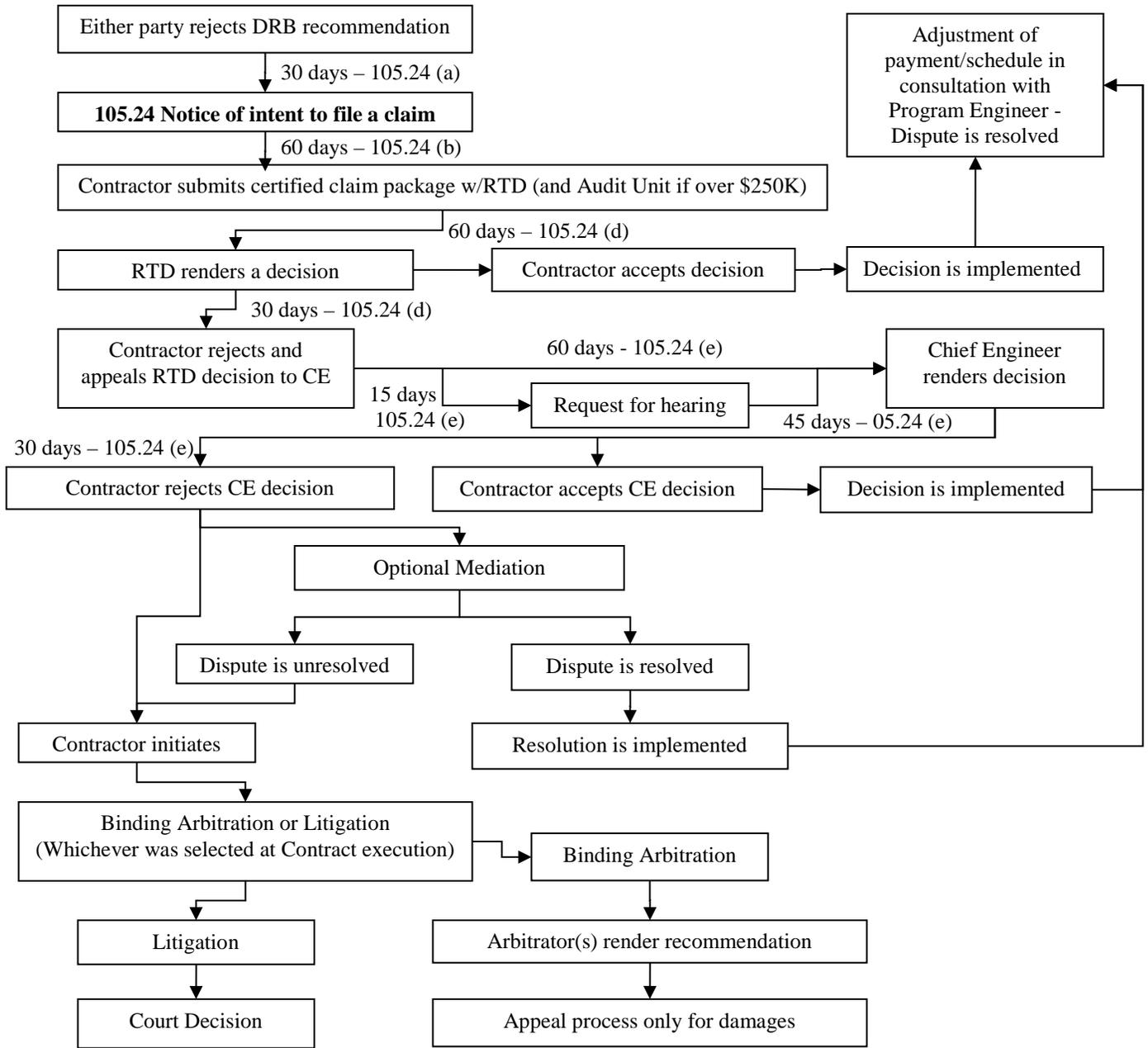
The following flow chart provides a summary of the disputes and claims process described in subsections 105.22, 105.23, and 105.24

**Figure 105-1  
DISPUTES AND CLAIMS FLOW CHART**



**Figure 105-1 continued on next page**

Figure 105-1 (continued)



**REVISION OF SECTION 106  
MATERIAL SOURCES**

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

In subsection 106.02 (a), delete the third paragraph and replace with the following:

The Contract will indicate whether the Department has or has not obtained the necessary County or City Zoning Clearance and the required permit from Colorado Department of Natural Resources needed to explore and remove materials from the available source. If the Department did not obtain the necessary clearances or permits, the Contractor shall obtain them. Any delays to the project or additional expenses that are incurred while these clearances or permits are being obtained shall be the responsibility of the Contractor. The Contractor shall ensure that the requirements of the permits do not conflict with the pit construction and reclamation requirements shown in the Contract for the available source.

In subsection 106.02 (b), delete the first paragraph and replace with the following:

(b) *Contractor Source.* Sources of sand, gravel, or borrow other than available sources will be known as contractor sources. The contractor source will be tested by the Department and approved by the Engineer prior to incorporation of the material into the project. If the submitted materials do not meet the contract specifications it will become the Contractor's responsibility to re-sample and test the material. The Contractor will supply the Department with passing test results from an AASHTO accredited laboratory and signed and sealed by a Professional Engineer. If requested by the Engineer, the Department will then re-sample and re-test the material for compliance to the contract specifications. The Contractor shall produce material which meets contract specifications throughout construction of the project.

The cost of sampling, testing, and corrective action by the Contractor will not be paid for separately but shall be included in the work.

**REVISION OF SECTIONS 106 AND 412  
SURFACE TEXTURE OF PORTLAND CEMENT CONCRETE PAVEMENT**

Sections 106 and 412 of the Standard Specifications are hereby revised for this project as follows:

Subsection 106.06 (a) shall include the following:

The Contractor shall submit the proposed method of PCCP texturing at the Pre-Construction conference for approval by the Engineer. The Contractor shall perform process control (PC) testing for the pavement surface texture depth in accordance with CP 77 Method B. All PC results for surface texture depth measurements shall be included in the Contractor's QC notebook. The start of PC testing for texturing depth shall be completed within 24 hours after the first 500 linear feet of textured pavement is placed for each lane. Paving shall not proceed until results are accepted by the Engineer.

Surface texture will be considered acceptable when the average texture depth (ATD) of the panel is greater than 0.05 inch. When the ATD is less than 0.05 inches, the Contractor shall determine the area represented by this test. The area shall be determined by taking additional tests at 15 foot intervals parallel to the centerline in each direction from the affected location until two consecutive tests are found to be within the specified limits. Any surface with unacceptable texturing exceeding 25 linear feet in any lane or shoulder greater than 8 feet wide shall be diamond ground full width of the lane. Upon the second unacceptable test result, the Contractor shall notify the Engineer, in writing, the action taken to provide an acceptable surface texture.

Subsection 106.06 (b) shall include the following

The Department will perform surface texture acceptance testing in accordance with CP 77 Method B. The Department will determine the panel locations where acceptance test measurements are to be taken. One stratified random acceptance test per 2,500 linear feet or fraction thereof in each lane and shoulder wider than 8 feet shall be taken with a minimum of one test per day when the Contractor is paving.

When the Department locates areas of surface texture that do not meet the minimum ATD, the Contractor will be notified and the Contractor shall be responsible for identifying the limits of the deficient texture depth. After the Engineer approves the limits, the Contractor shall correct the deficient surface texture by diamond grinding full lane

width to provide an ATD greater than 0.05 inch at no additional cost to the project. Correcting surface texture deficiencies shall occur prior to pavement smoothness testing and pavement thickness determinations.

In subsection 106.06, delete the Tining Depth element from Tables 106-2 and 106-3 and replace with the following:

**Table 106-2**

Element	Minimum Testing Frequency Contractor's Quality Control
Average Texture Depth	1 per 528 linear feet in each lane and shoulder wider than 8 feet.

**Table 106-3**

Element	Minimum Testing Frequency Contractor's Quality Control
Average Texture Depth	1 per 528 linear feet in each lane and shoulder wider than 8 feet.

Delete subsection 412.07 (c)

Delete subsection 412.12 (c) and (d) and replace with the following:

- (c) *Final Finish and Stationing.* The final surface of the pavement shall be uniformly textured with a broom, burlap drag, artificial turf or diamond ground in order to obtain the specified texture depth. Surface imperfections resulting from the texturing operation shall be corrected by the Contractor at no additional cost.

Broom, burlap drag or artificial turf texture shall be installed within 15 minutes after strike-off, or as pavement conditions allow

Diamond grinding shall be performed using diamond blades mounted on a self-propelled machine designed for diamond grinding and texturing concrete pavement. The equipment shall have a positive means of vacuuming the grinding residue from the pavement surface, leaving the surface in a clean, near-dry condition. Diamond grinding shall not occur until the concrete has attained strength of at least 2,500 psi.

The diamond grinding process shall produce a pavement surface that is true to grade and uniform in appearance. The grooves shall be evenly spaced. Any ridges on the outside edge next to the shoulder, auxiliary, or ramp lanes greater than 3/16 inch high shall be feathered out to the satisfaction of the Engineer in a separate, feather pass operation.

The pavement surface after diamond grinding shall have no depressions or misalignment of slope in the longitudinal direction exceeding 1/8 inch in 12 feet when measured with a 12 foot straightedge placed parallel to the centerline. All areas of deviation shall be reground at no additional cost.

Stationing shall be stamped into the outside edge of the pavement, as shown on the plans.

Delete subsection 412.14 and replace with the following:

**412.14 Curing.** Immediately after the finishing operations have been completed the entire surface and exposed sides of the newly placed concrete, shall be sprayed uniformly with a curing compound meeting the requirements of ASTM C309, Type 2. The ASTM C309 Type 2 curing compound shall be volatile organic content (VOC) compliant.

The curing compound shall be applied within 10 minutes after the final finish has been applied. Failure to cover the surface of the concrete within 10 minutes shall be cause for immediate suspension of the paving operations.

An initial application of curing compound shall be applied under pressure by mechanical sprayers at the rate of not less than 1 gallon per 180 square feet of pavement surface. A second application of curing compound shall be applied within 30 minutes after the initial application. The second application rate shall be not less than 1 gallon per 180 square feet of pavement surface. Alternatively, the Contractor may apply the curing compound in one application of not less than 1 gallon per 120 square feet. Additional curing compound shall be applied as needed to ensure that 100 percent of the pavement is covered. The spraying equipment shall be fully automated, equipped with a tank agitator, and a wind guard. During application, the compound shall be in a thoroughly mixed condition with the pigment uniformly dispersed throughout the vehicle and the compound shall be stirred continuously by effective mechanical means. Hand spraying of irregular widths or shapes and surfaces exposed by removal of forms will be permitted. Curing compounds shall not be applied to the inside faces of joints to be sealed.

Should the curing film become damaged from any cause, within 72 hours after concrete placement, except for Class E concrete open to traffic, the damaged portions shall be repaired immediately with additional curing compound, payment for which shall be at the Contractor's expense.

The sides of pavement slabs shall be immediately sprayed with curing compound when the forms are removed.

Delete subsection 412.18(2) and replace with the following:

(2) Corrective work for texturing.

Delete subsection 412.22 and replace with the following:

**412.22 Opening to Traffic.** The pavement shall not be opened to traffic until the concrete has achieved a compressive strength of 3000 psi. Concrete compressive strength shall be determined by maturity meters. Prior to opening the pavement to traffic the roadway shall be cleaned, as approved.

Prior to placement of concrete whose strength will be determined with maturity meters, the Contractor shall provide the Engineer a report of maturity relationships in accordance with CP 69. The Contractor shall provide maturity meters and all necessary wires and connectors. The Contractor shall be responsible for the placement and maintenance of the maturity meters and wires. At a minimum a maturity meter will be placed at a minimum of once per day and then once per 5,000 square yards. Placement shall be as directed by the Engineer.

For placements with multiple maturity meters, the lowest compressive strength shall determine when the pavement may be opened to traffic.

If a maturity meter fails, is tampered with, is destroyed or was not placed, the section of pavement represented by the maturity meter shall remain closed to traffic for a period of 28 days. The Contractor may choose at his own expense to core the section of pavement represented by the maturity meter. Cores will be obtained and tested according to CP 65. Cores will be a minimum of 4 inches in diameter. A minimum of three cores in a two square foot area will be obtained. If the compressive strength of any one core differs from the average by more than 10 percent that compressive strength will be deleted and the average strength will be determined using the compressive strength of the remaining two cores. If the compressive strength of more than one core differs from the average by more than 10 percent the average strength will be determined using all three compressive strengths of the cores. To open the section of pavement, the average compressive strength of the cores shall be a minimum of 3,000 psi.

In subsection 412.24 (a) delete the second paragraph and replace with the following:

The price per square yard of Concrete Pavement shall be full compensation for furnishing and placing all materials, including any dowels, tie bars, joint materials, texturing, sawing, finishing, and rumble strips.

### **REVISION OF SECTIONS 106, 627 AND 713 GLASS BEADS FOR PAVEMENT MARKING**

Sections 106, 627, and 713 are hereby revised for this project as follows:

Subsection 106.11 shall include the following:

All post consumer and industrial glass beads for pavement marking shall have been manufactured from North American glass waste streams in the United States of America. The bead manufacturer shall submit a COC in accordance with subsection 106.12 confirming that North American glass waste streams were used in the manufacture of the glass beads.

Subsection 627.04 shall include the following:

Glass beads shall be applied into the paint by means of a low pressure, gravity drop bead applicator.

In subsection 627.05, delete the seventh paragraph and replace with the following:

Epoxy pavement marking shall be applied to the road surface according to the epoxy manufacturer's recommended methods at the application rate or coverage shown below. Glass beads shall be applied into the epoxy pavement marking by means of a low pressure, gravity drop bead applicator.

In subsection 627.05, delete the last paragraph and replace with the following:

Epoxy pavement marking and beads shall be applied within the following limits:

	Application Rate or Coverage Per Gallon of Epoxy Pavement Marking	
	Minimum	Maximum
16 – 18 mil marking	90 sq. ft.	100 sq. ft.
Beads	20 lbs.	22 lbs.

Subsection 627.06 (c) shall include the following:

Glass beads shall be applied into the thermoplastic pavement marking by means of a low pressure, gravity drop bead applicator.

In subsection 713.08, delete the first and third paragraphs and replace with the following:

**713.08 Glass Beads for Pavement Marking.** Glass beads for pavement marking shall conform to AASHTO M 247, except for the following:

(1) Gradation:

U.S. Mesh	Microns	% Passing	
		Epoxy and MMA	Waterborne, Low VOC and High Build
16	1180	90-100	100
18	1000	65-80	97-100
20	850		85-100
30	600	30-50	50-70
40	425		10-35
50	300	0-5	0-10
80	180		0-5

(2) Roundness: All beads shall meet a minimum of 80 percent true spheres in accordance with the Office of Federal Lands Highways FLH T520 or a computerized optical testing method.

(3) Color / Clarity: Beads shall be colorless, clear, and free of carbon residues.

(4) Refractive Index: Minimum 1.51 by oil immersion method.

(5) Air Inclusions: Less than 5 percent by visual count.

(6) Coatings: Per manufacturer’s recommendation for optimum adhesion and embedment.

(7) Chemical Resistance: Beads shall be resistant to hydrochloric acid, water, calcium chloride, and sodium sulfide as tested per methods outlined in sections 4.3.6 to 4.3.9 of the TT-B Federal Spec.1325D.

(8) For Epoxy Pavement Marking, a minimum of 40 percent of the total weight shall be manufactured using a molten kiln direct melt method. For Waterborne and Low VOC Paint, a minimum of 15 percent of the total weight shall be manufactured using a molten kiln direct melt method. All molten kiln direct melt glass beads shall be above the 600 µm (#30) sieve.

(9) Glass beads used for any type of pavement marking shall not contain more than 75 parts per million (ppm) arsenic, 75 ppm antimony and 100 ppm lead, as tested in accordance with EPA methods 3052 and 6010C, or other approved testing method

**REVISION OF SECTION 106  
CERTIFICATES OF COMPLIANCE AND CERTIFIED TEST REPORTS**

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

In subsection 106.12, delete the second paragraph and replace it with the following:

The original Certificate of Compliance shall include the Contractor's original signature as directed above. The original signature (including corporate title) on the Certificate of Compliance, under penalty of perjury, shall be of a person having legal authority to act for the manufacturer. It shall state that the product or assembly to be incorporated into the project has been sampled and passed all specified tests in conformity to the plans and specifications for this project. One legible copy of the fully signed Certificate of Compliance shall be furnished to the Engineer prior to installation of material. The original shall be provided to the Engineer before payment for the represented item will be made.

In subsection 106.13, delete the second paragraph and replace it with the following:

The Certified Test Report shall be a legible copy or an original document and shall include the Contractor's original signature as directed above. The signature (including corporate title) on the Certified Test Report, under penalty of perjury, shall be of a person having legal authority to act for the manufacturer or the independent testing laboratory. It shall state that the test results show that the product or assembly to be incorporated into the project has been sampled and passed all specified tests in conformity to the plans and specifications for this project. One legible copy or original document of the fully signed Certified Test Report shall be furnished to the Engineer prior to installation of material. Failure to comply may result in delays to the project or rejection of the materials.

**REVISION OF SECTION 107  
RESPONSIBILITY FOR DAMAGE CLAIMS, INSURANCE TYPES AND COVERAGE LIMITS**

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

Delete subsection 107.15(c) and replace it with the following:

- (c) Each insurance policy shall include provisions preventing cancellation or non-renewal without at least 30 days prior notice to Contractor. The Contractor shall forward to the Engineer any such notice received within seven days of the Contractor's receipt of such notice.

**REVISION OF SECTIONS 107 AND 208  
WATER QUALITY CONTROL UNDER ONE ACRE OF DISTURBANCE**

Sections 107 and 208 of the Standard Specifications are hereby revised for this project as follows:

In subsection 107.25(b) 6 delete the second paragraph and replace it with the following:

The Contractor shall record the location of potential pollutants on the plans. Descriptions of the potential pollutants shall be submitted to and approved by the Engineer.

In subsection 208.03 delete the first paragraph and replace it with the following:

Prior to construction the Contractor shall implement BMPs in accordance with the approved project schedule as described in subsection in 208.03(b).

In subsection 208.03 delete the third, fourth, and fifth paragraphs and replace them with the following:

The Contractor 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 Contractor 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 plans.

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

Delete subsections 208.03(c) and (d) and replace them with the following:

- (c) *Implementation, Maintenance and Revision of the SWMP.*

The Contractor's responsibilities shall be as follows:

- (1) Install, construct, and maintain all BMPs specified in the Contract and coordinate the construction of BMPs with all other construction operations.
  - (2) Implement suitable temporary erosion and sediment control features as necessary to correct unforeseen conditions or emergency situations. Dismantle those features when their purpose has been fulfilled unless the Engineer directs that the features be left in place.
  - (3) Implement necessary actions to reduce anticipated or presently existing water quality or erosion problems resulting from construction activities.
  - (4) Make available, all labor, material, and equipment needed to install, maintain, and remove BMPs.
  - (5) The Contractor shall assign to the project an individual to serve in the capacity of Stormwater Administrator (SWMP Administrator). These duties may be assumed by the Superintendent. The SWMP Administrator shall be experienced in all aspects of construction and have satisfactorily completed a Transportation Erosion Control Supervisor Certification (TECS) training authorized by the Department. Proof that this requirement has been met shall be submitted to the Engineer prior to or at the preconstruction conference. A list of authorized TECS training programs will be provided by the Engineer upon request by the Contractor. The SWMP Administrator shall be the person responsible for ensuring that the responsibilities listed in (1) through (7) in (d) are fulfilled.
- (d) *Documentation Available on the Project.* The following Contract documents and references will be made available for reference in one location on the project during construction.
1. Project Documents. The following documents shall be kept, maintained, and updated in a single notebook:
    - (1) SWMP Sheets
    - (2) SWMP site map, if applicable to the project.
    - (3) Details of BMPs used on the project not covered in Standard Plan M-208-1.
    - (4) List of potential pollutants as described in subsection 107.25.
    - (5) Spill Response Plan and reports of spills submitted to CDPHE.
    - (6) Form 105s and all other correspondence relating to water quality.
    - (7) Project environmental permits and associated applications and certifications.
  2. Reference Materials
    - (1) CDOT *Erosion Control and Stormwater Quality Guide*.
    - (2) CDOT *Erosion Control and Stormwater Quality Field Guide*.
    - (3) Copy of biological opinion, if applicable.

In subsection 208.04 delete the first and second paragraphs and replace them with the following:

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

Vehicle tracking pads shall be used at all vehicle and equipment access points to the site to prevent sediment exiting the project site onto paved public roads. Access shall be provided only at locations approved by the Engineer.

Delete subsection 208.04(e) and replace it with the following:

(e) *Stabilization.* Once earthwork has begun on a section, it shall be pursued until completion.

Clearing and grubbing operations shall be scheduled and performed so that grading operations and final stabilization measures can follow immediately thereafter if the project conditions permit. Otherwise temporary stabilization measures shall be taken between successive construction stages. Additional work required because the Contractor has failed to properly coordinate the entire erosion control schedule, thus causing previously seeded areas to be disturbed by operations that could have been performed prior to the seeding shall be performed at the Contractor's expense.

In subsection 208.06 delete the first paragraph and replace it with the following:

**208.06 Materials Handling and Spill Prevention.** The Contractor 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 spill contingency plans in place as specified in subsections 107.25(b) 6 or 208.06(c).

In subsection 208.07 delete the second paragraph and replace it with the following:

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.

In subsection 208.08, delete the first paragraph and replace it with the following:

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 conditions. Off road staging areas must be pre-approved by the Engineer, unless otherwise designated in the Contract. 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 Contractor shall tabulate additional disturbances not identified in the SWMP and indicate locations and quantities on the SWMP and report to the Engineer.

In subsection 208.06 (c), delete (1) and replace with the following:

- (1) Identification and contact information of the Contractor, CDOT spill cleanup coordinators and the SWMP Administrator.

In subsection 208.09, second paragraph, delete the list and replace it with 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 implement necessary actions required by the Engineer as required by subsection 208.03(c) 4.
- (3) Failure to amend SWMP and implement BMPs as required by subsection 208.04.
- (4) Failure to keep documentation and records current.
- (5) 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).
- (6) Failure to stabilize disturbed areas as required by subsections 208.04(e) and 208.08.
- (7) Failure to replace or perform maintenance on an erosion control feature after notice from the Engineer to replace or perform maintenance as required by subsection 208.04(f).
- (8) Failure to remove and dispose of sediment from BMPs as required.
- (9) Failure to install and properly utilize a concrete washout structure for containing washout from concrete placement operations.
- (10) Failure to perform permanent stabilization as required by subsection 208.04 (e).

The Engineer will immediately notify the Contractor in writing of each incident of failure to perform erosion control in accordance with these specifications, including items (1) through (10) above. 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 notification, including items (1) through (10) above, 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.

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 an exceedance of a water quality standard.

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 be assessed until the corrective work has been completed and accepted. .

Deferment of work to correct failure 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 Liquidated 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 Engineer, SWMP Administrator, and Superintendent, shall be discussed with the Resident Engineer. If after the discussions, the SWMP Administrator, 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. This meeting will also be attended by the Resident Engineer 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 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 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. .

Delete subsection 208.10 and replace it with the following:

**208.10 Items to Be Accomplished 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.* The Contractor shall survey Permanent Water Quality BMPs (Permanent BMPs) on the project after they are constructed and confirm they are at final configuration and grade. The Engineer will identify which Permanent BMPs shall be surveyed prior to the final walk through. The survey shall be performed in accordance with Section 625.
- (c) *Removal of Temporary BMPs.* Temporary BMPs subject to removal will be determined by the Engineer at the final walk through of the project and shall be removed by the Contractor. If any temporary BMPs are left in place, the Region's Water Pollution Control Manager shall be notified of the BMP locations.

In subsection 208.12, delete the first paragraph and replace with the following:

SWMP Administrator duties on projects having less than one acre of total disturbed area will not be measured and paid for separately but shall be included in the work. The Erosion Control Management Pay Item will not apply to these projects.

**REVISION OF SECTION 107  
WARNING LIGHTS FOR WORK VEHICLES AND EQUIPMENT**

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

Subsection 107.06 (b) shall include the following:

All work vehicles and mobile equipment shall be equipped with one or more functioning warning lights mounted as high as practicable, which shall be capable of displaying in all directions one or more flashing, oscillating, or rotating lights for warning roadway traffic. The lights shall be amber in color. The warning lights shall be activated when the work vehicle or mobile equipment is operating within the roadway, right of way or both. All supplemental lights shall be SAE Class 1 certified.

**REVISION OF SECTION 108  
SUBLETTING OF CONTRACT**

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

Delete subsection 108.01 and replace with the following:

**108.01 Subletting of Contract.** The Contractor shall not sublet, sell, transfer, assign, or dispose of the Contract or Contracts, or any portion thereof without written permission of the Engineer. Prior to beginning any work by subcontractor, the Contractor shall request permission from the Engineer by submitting a completed Sublet Permit Application, CDOT Form No. 205. The subcontract work shall not begin until the Contractor has received the Engineer's written permission. The Contractor shall make all project related written subcontracts, agreements, and purchase orders available to the Engineer for viewing, upon request and at a location convenient to the Engineer.

The Contractor will be permitted to sublet a portion of the Contract, however, the Contractor's organization shall perform work amounting to 30 percent or more of the total original contract amount. Any items designated in the contract as "specialty items" may be performed by subcontract. The cost of "specialty items" so performed by subcontract may be deducted from the total original contract amount before computing the amount of work required to be performed by the Contractor's own organization. The original contract amount includes the cost of material and manufactured products which are to be purchased or produced by the Contractor and the actual agreement amounts between the Contractor and a subcontractor. Proportional value of a subcontracted partial contract item will be verified by the Engineer. When a firm both sells material to a prime contractor and performs the work of incorporating the materials into the project, these two phases shall be considered in combination and as constituting a single subcontract.

The calculation of the percentage of subcontracted work shall be based on subcontract unit prices.

Subcontracts or transfer of Contract shall not release the Contractor of liability under the Contract and Bond.

**REVISION OF SECTION 108  
NOTICE TO PROCEED**

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

Delete subsection 108.02 and replace with the following:

**108.02 Notice to Proceed.** The Contractor shall not commence work prior to the issuance of a Notice to Proceed. The "Notice to Proceed" will stipulate the date on which contract time commences. When the Contractor proceeds with work prior to that date, contract time will commence on the date work actually begins. The Contractor shall commence work under the Contract on or prior to the 15th day following Contract execution or the 30th day following the date of award, whichever comes later, or in accordance with the selected start date allowed in the special provisions.

## REVISION OF SECTION 108 PROJECT SCHEDULE

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

Delete subsection 108.03 and replace with the following:

### **108.03 Project Schedule.**

(a) *Definitions.*

**Activity.** An activity is a project element on a schedule that affects completion of the project. An activity has a description, start date, finish date, duration, and one or more logic ties.

**Activity ID.** A unique, alphanumeric, identification code assigned to an activity and remains constant throughout the project.

**Bar Chart.** A simple depiction of a Project Schedule without relationships or supporting logic of the schedule.

**Calendar.** Defined work periods and no work periods that determine when project activities can occur. Multiple calendars may be used for different activities; e.g., a 5-day work-week and a 7-day work-week calendar.

**Constraint.** A restriction imposed in a schedule, which fixes a value that would otherwise be calculated within the schedule. Examples of values that can be fixed by a constraint include start date, end date, and completion date.

**Critical Path.** The sequence of activities that determines the duration of the project.

**Critical Path Method Scheduling.** (CPM Scheduling) is a logic-based planning technique using activity durations and relationships between activities to calculate a schedule determining the minimum total project duration.

**Data Date.** The starting point from which to schedule all remaining work.

**Duration.** The estimated amount of time needed to complete an activity.

**Float.** The amount of time between the earliest date an activity can start and the latest date when an activity must start, or the earliest date an activity can finish and latest date when an activity can finish before the activity becomes critical. The time between the Project Schedule completion date and the Contract completion date is not considered float.

**Gantt Chart.** A time-scaled graphical display of the project's schedule.

**Lag.** A time-value assigned to a relationship.

**Logic.** Relationships between activities defining the sequence of work (See also predecessor activity and successor activity).

**Milestone.** An activity, with no duration used to represent an event.

**Open-Ended Activity.** An activity that does not have both a predecessor activity and a successor activity.

**Predecessor Activity.** An activity that is defined by schedule logic to precede another activity.

**Relationship.** The interdependence between activities.

**Salient Feature.** An item of work that is of special interest for CDOT in coordinating the project schedule but may not affect the overall completion of the project.

**Successor Activity.** An activity that is defined by schedule logic to follow another activity.

**Time-Scaled Logic Diagram.** Gantt chart that illustrates logic links depicting both schedule logic and the time at which activities are performed.

(b) *Project Schedule - General*

The Contractor shall use either Microsoft Project or Primavera Scheduling software to develop and manage a CPM Project Schedule to plan, schedule, and report the progress of the work. Prior to, or at the Pre-construction Conference, the Contractor shall notify the Engineer in writing, which scheduling software the Contractor shall use to manage the project. The Contractor's selection and use of particular scheduling software cannot be changed after the first schedule submittal. If the Contractor selects Primavera, the Contractor shall calculate the schedule using the Retained Logic scheduling option. The Department will not allow use of bar charts for the Project Schedule.

The Contractor shall submit schedules for approval by the Engineer. The purpose of these schedules is to allow the Contractor and the Department to jointly manage the work and evaluate progress. The schedules also serve to evaluate the affect of changes and delays to the scheduled project completion. Either party may require a formal schedule review meeting.

The Contractor's schedule shall consist of a time-scaled logic diagram and shall show the logical progression of all activities required to complete the work.

The Contractor shall use activity descriptions that ensure the work is easily identifiable. The Contractor shall show the no-work days in the schedule calendars.

The Contractor shall use durations for individual construction activities that do not exceed 15 calendar days unless approved by the Engineer. The Contractor may group a series of activities with an aggregate duration of five days or less into a single activity. Non-construction activities may have durations exceeding 15 working days, as approved by the Engineer.

The Contractor may include summary bars in the schedule as long as the detailed activities to complete the work are displayed.

The Contractor shall not use the following:

- (1) Negative lags
- (2) Lags in excess of 10 working days without approval by the Engineer. The Contractor's written request shall justify the need for the lag. Lags shall be identified.
- (3) Start-to-finish relationships.
- (4) Open-ended activities - every activity shall have at least one predecessor activity and at least one successor activity, except for the first and last activities in the network. If the contractor uses a start-to-start relationship to link two activities, then both of those two activities should also have successor activities linked by either a finish-to-start or a finish-to-finish relationship.
- (5) Constraints without approval by the Engineer. The Contractor's written request shall explain why the use of constraints in the schedule is necessary.

The Project Schedule shall show all activities required by all parties to complete the work. The Project Schedule shall include subcontracted work, delivery dates for critical material, submittal and review periods, permits and governmental approvals, milestone requirements, utility work by others and no work periods. The Contractor, its subcontractors, suppliers, and engineers, at any tier, shall perform the work according to the approved Project Schedule.

Float within the Baseline Schedule or any other Project Schedule is not for the exclusive use or benefit of either party, but is a project resource available to both parties as needed until it is depleted.

For any schedule submittal that shows completion in less than 85 percent of the Contract Time, the Contractor shall submit planned production rates in the schedule for all activities with float of 10 days or less. The Engineer may require additional methods statements for activities with float of 10 days or less.

The Engineer's review of the schedule will not exceed 10 calendar days. The Engineer will provide the Contractor with one of the following responses within 10 days after receipt of the Project Schedule:

- (1) Approved, no exceptions taken;
- (2) Approved-as-Noted; or
- (3) Revise and Resubmit within 10 days.

The Contractor shall not assume that approval of the Project Schedule relieves the Contractor of its obligation to complete all work within the Contract Time.

- (c) *Schedule Submittals*. The Contractor shall include a time-scaled logic diagram with all schedule submittals that:
- (1) Is plotted on a horizontal time-scale in accordance with the project calendar.
  - (2) Uses color to clearly identify the critical path.
  - (3) Is based on early start and early finish dates of activities.
  - (4) For Schedule Updates and Schedule Revisions, shows actual completion dates up to but not including the data date.
  - (5) Clearly shows the sequence and relationships of all activities necessary to complete the contract work.
  - (6) Includes an activity block for each activity with the following information:

<b>Activity ID</b>	<b>Activity Description</b>
Original Duration	Total Float
Early start date	Early finish date
Late start date*	Late finish date*
Actual Start date^	Actual Finish date^
Calendar used on the activity	Activity Responsibility
Remaining Duration^	Duration Percent Complete^
Gantt chart (time-scaled logic diagram)	
*Required with the Preliminary and Baseline Schedule.	
^Required with the Project Schedule Update and Schedule Revision.	

The Contractor shall include the following with all schedule submittals:

- (1) A Job Progress Narrative Report that includes the following:
  - (i) A description of the work performed since the previous month's schedule update.
  - (ii) A description of problems encountered or anticipated since the previous month's schedule submission.
  - (iii) A description of unusual labor, shift, equipment, or material conditions or restrictions encountered or anticipated.
  - (iv) The status of all pending items that could affect the schedule.
  - (v) Explanations for milestones forecasted to occur late.
  - (vi) Scheduled completion date status and any change from the previous month's submission.
  - (vii) An explanation for a scheduled completion date forecasted to occur before or after the contract completion date or contract time.
  - (viii) Schedule Delays:
    1. A description of current and anticipated delays including: Identification of the delayed activity or activities by Activity ID(s) and description(s).
    2. Delay type with reference to the relevant specification subsection.
    3. Delay cause or causes.
    4. Effect of the delay on other activities, milestones, and completion dates.
    5. Identification of the actions needed to avoid a potential or mitigate an actual delay.
    6. A description of the critical path impact and effect on the scheduled completion date in the previous month's schedule update.
  - (ix) A list of all added and deleted activities along with an explanation for the change.
  - (x) All logic and duration changes along with an explanation for the change.
- (2) A Predecessor Activity and Successor Activity report that defines all schedule logic and clearly indicates all logical relationships and constraints.
- (3) An Early Start report listing all activities, sorted by actual start/early start date.
- (4) A Float report listing all activities sorted in ascending order of available float.
- (5) A Critical Path report listing all activities not yet complete with the percent complete, sorted by float and then by early start.
- (6) A listing of all non-work days.

For all required schedule submittals, the Contractor shall submit two electronic copies on two compact disk, USB flash drive, or other media as directed by the Engineer. Electronic copies of CPM schedules shall be submitted both in the native schedule format and in "PDF" format. The Contractor shall also provide two printed copies of the CPM Schedule and all reports.

Each schedule submittal shall be appropriately labeled as a Preliminary Schedule, Baseline Schedule, Project Schedule Update, or Schedule Revision. The title bar shall include the CDOT project number, subaccount, project name, contractor name, schedule data date. If an originally submitted schedule is revised during review, the title bar shall also include a revision number (REV1, REV2, etc.) and revision date.

- (d) *Preliminary Schedule.* Within 14 days of award of the Contract, the Contractor may submit a Preliminary Schedule showing all planned activities from the Notice to Proceed through the first 60 days of the project. If the Contractor elects not to submit a Preliminary Schedule, then the Contractor shall submit a complete Baseline Schedule within 14 days of award of the Contract, which will be subject to all requirements of a Baseline submittal. The Preliminary Schedule shall not show any progress and it will be approved by the Engineer before work can commence. The Preliminary Schedule shall be used as the basis for the Baseline Schedule.
- (e) *Baseline Schedule.* If the Contractor elects to submit a Preliminary Schedule, within 45 days of the award of Contract, the Contractor shall submit a Baseline Schedule that includes all work activities completed within Contract Time. The Contractor shall not show progress in the Baseline Schedule. Further partial payments will not be made beyond 60 days after the start of Contract Time unless the Baseline Schedule is approved. When approved, the Baseline Schedule shall become the Project Schedule.

The Contractor shall use all information known by the Contractor at the time of bid submittal to develop the Baseline Schedule.

If the Contractor elects to submit a Baseline Schedule in lieu of a Preliminary Schedule, the Baseline Schedule shall be approved before work can commence.

- (f) *Methods Statements.* The Contractor shall submit a Methods Statement for each salient feature or as directed by the Engineer that describes all work necessary to complete the feature. The Contractor shall include the following information in the Methods Statement:
  - (1) Salient feature name;
  - (2) Responsibility for the salient feature work;
  - (3) Planned work procedures;
  - (4) The planned quantity of work per day for each salient feature using the same units of measure as the applicable pay item;
  - (5) The anticipated labor force by labor type;
  - (6) The number, types, and capacities of equipment planned for the work;
  - (7) The planned time for the work including the number of work days per week, number of shifts per day, and the number of hours per shift.
- (g) *Project Schedule Update.* The Contractor shall submit a monthly update of the Project Schedule updated through the cut-off date for the monthly progress pay estimate, and a projection for completing all remaining activities. A schedule update may show a completion date that is different than the Contract completion date, after the baseline schedule is approved. Approval of this schedule shall not relieve the Contractor of its obligation to complete the work within the Contract Time. In this case, the Contractor shall provide an explanation for a late scheduled completion date in the Job Progress Narrative Report included with the schedule submittal.

When approved, the Project Schedule Update will become the Project Schedule. The Engineer will not issue a monthly progress payment if the Engineer has not received the Project Schedule Update. The Engineer will not make monthly progress payments for the months following the Project Schedule Update submission until the Engineer approves the Project Schedule Update.

When the project has a maintenance or landscape establishment period, the Engineer may waive the monthly update requirement. The Contractor shall submit a final Project Schedule Update that shows all work through the final acceptance date.

- (h) *Weekly Planning Schedule.* The Contractor shall submit, in writing, a Weekly Planning Schedule that shows the Contractor's and all Subcontractor's planned activities for a minimum of two weeks immediately following the date of submittal and actual days worked versus planned for the week prior to the date of submittal. This schedule shall include the description, duration and sequence of work activities and anticipated lane closures for the upcoming two weeks. The Weekly Planning Schedule may be a time-scaled logic diagram or other standard format as approved

by the Engineer. subsection 108.03(c) Schedule Submittal requirements for reports do not apply to the Weekly Planning Schedule.

- (i) *Schedule Revision.* A Schedule Revision is required in the event of any major change to the work. Examples of major changes are:
- (1) Significant changes in logic or methods of construction or changes to the critical path;
  - (2) Addition, deletion, or revision of activities required by contract modification order;
  - (3) Approval of a Contractor submitted Value Engineering Change Proposal;
  - (4) Delays in milestones or project completion;
  - (5) Phasing revisions, or;
  - (6) If the Engineer determines that the schedule does not reflect the actual work.

This revision shall include a description of the measures necessary to achieve completion of the work within the Contract Time. The Contractor may also need to submit revised Methods Statements. The Contractor shall provide a Schedule Revision within 10 days of written notification and shall include the diagrams and reports as described in subsection 108.03 (b) Schedule - General and (c) Schedule Submittals. In this case, the Contractor shall provide an explanation for a late scheduled completion date in the Job Progress Narrative Report included with the schedule.

Once approved, the Schedule Revision becomes the Project Schedule.

- (j) *Payment.* All costs relating to the requirements of this subsection will not be paid for separately, but shall be included in the work.

### **REVISION OF SECTION 108 DELAY AND EXTENSION OF CONTRACT TIME**

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

In subsection 108.08, delete (c) and (d) and replace with the following:

- (c) *Delay.* Any event, action or factor that extends the performance period of the Contract.

1. *Excusable Delay:* A delay that was beyond the Contractor's control and was not due to the Contractor's fault or negligence. The Department may grant a contract time extension for an excusable delay.
  - A. *Compensable Delay:* A delay that the Department, not the Contractor, is responsible for entitling the *Contractor* to a time extension and monetary compensation. Monetary compensation for compensable delays will be made in accordance with Subsection 109.10.
  - B. *Noncompensable Delay:* An excusable delay that neither the Contractor nor the Department is responsible for that may entitle the Contractor to a contract time extension but no additional monetary compensation. Contract time allowed for the performance of the work may be extended for delays due to force majeure (i.e. acts of God, acts of the public enemy, terrorist acts, fires, floods, area wide strikes, embargoes, or unusually severe weather).
2. *Nonexcusable Delay:* A delay that was reasonably foreseeable or within the control of the Contractor for which the Department will not grant monetary compensation or a contract time extension.
3. *Concurrent Delay.* Independent delays to critical activities occurring at the same time.
  - A. The *Department* will not grant a time extension or additional compensation for the period of time that a non-excusable delay is concurrent with an excusable delay.
  - B. The Department may grant time but no compensation for the period of time that a non-compensable delay is concurrent with a compensable delay.

Delays in delivery of materials or fabrication scheduling resulting from late ordering, financial considerations, or other causes that could have been foreseen or prevented will be considered nonexcusable delays. However, delays caused by fuel shortage or delay in delivery of materials to the Contractor due to some unusual market condition caused by industry-wide strike, national disaster, area-wide shortage, or other reasons beyond the control of the

Contractor which prevent procurement of materials or fuel within the allowable contract time limits will be considered excusable delays.

(d) *Extension of Contract Time.* The Contractor's assertion that insufficient contract time was specified is not a valid reason for an extension of contract time. For time extension requests, the Contractor shall provide a two-part submittal: part one shall consist of a written notice of the delay and part two shall consist of the Contractor's delay documentation and supporting analysis.

Part 1: The Contractor shall provide the written notice of delay within seven days of the delay occurrence. The notice shall describe the delay and include documentation substantiating the nature and cause of the delay. Failure to submit the written notice constitutes a waiver of entitlement to additional time or compensation.

Part 2: This shall be submitted within 30 days of the written notice. The Contractor shall include all documentation needed to support the time extension request. In order to request additional contract time for an unexpected delay, the Contractor shall provide a contemporaneous schedule analysis in accordance with subsection 108.03. The schedule analysis shall show that the delayed activity or activities were on the critical path or became critical due to the delay.

The Engineer will base a determination of an allowable contract time extension on:

- (1) The current Schedule in effect at the time of the alleged delay;
- (2) The supporting documentation submitted by the Contractor;
- (3) The contemporaneous schedule analysis; and
- (4) Any other relevant information available to the Engineer.

For a time extension request resulting from a change order, the Contractor shall demonstrate the delay to the project completion date by:

- (1) Inserting a fragnet containing the change order activities into an unprogressed copy of the schedule that is current at the time of the change order;
- (2) tying the fragnet into the schedule logic; and
- (3) Recalculating the schedule.

The Department will not consider delays to activities which do not affect the performance period of the Contract as a basis for a Contract time extension. If the Engineer grants a contract time extension, the revised Contract Completion date will be in effect as though it were the original contract date.

A Contractor's failure to have an approved, or approved with comments, current project schedule in place will preclude the Department from considering a Contractor's a time extension request.

**REVISION OF SECTION 108  
LIQUIDATED DAMAGES**

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

In subsection 108.09, delete the Schedule of Liquidated Damages and replace with the following:

Original Contract Amount (\$)		Liquidated Damages per Calendar Day (\$)
From More Than	To And Including	
0	150,000	500
150,000	500,000	1,000
500,000	1,000,000	1,600
1,000,000	2,000,000	2,300
2,000,000	4,000,000	4,100
4,000,000	10,000,000	5,800
10,000,000	-----	5,800 plus 1,600 Per Each Additional 1,000,000 Contract Amount or Part Thereof Over 10,000,000

**REVISION OF SECTIONS 203, 206, 304 AND 613  
COMPACTION**

Sections 203, 206, 304 and 613 of Standard Specifications are hereby revised for this project as follows:

In subsection 203.03 (a), delete the fifth paragraph and replace with the following:

1. *Soil Embankment.* Soil embankment consists of materials with 50 percent or more of the material passing the 4.75 mm (No. 4) sieve.

A soil embankment may also have more than 50 percent of the material retained on the 4.75 mm (No. 4) sieve, but no more than 30 percent of the material retained on the 19 mm (3/4 inch) sieve.

Soil embankment shall be constructed with moisture density control in accordance with the requirements of subsection 203.07.

2. *Rock Embankment.* Rock embankment consist of materials with 50 percent or more of the material retained on the 4.75 mm (No. 4) sieve and with more than 30 percent of the material retained on the 19 mm (3/4 inch) sieve. All material shall be smaller than 6 inches. Rock embankments shall be constructed without moisture density control in accordance with the requirements of subsection 203.08.

Delete Subsection 203.07 and replace with the following:

**203.07 Construction of Embankment and Treatment of Cut Areas with Moisture and Density Control.** Soil embankments shall be constructed with moisture and density control and the soil upon which the embankments are to be constructed shall be scarified to a depth of 6 inches and compacted with moisture and density control. The moisture content of the soil at the time of compaction shall be as specified or directed.

The material shall be removed from the full width of roadbed in all cut sections to the designated depth. The soil below the designated depth shall be thoroughly scarified to a depth of 6 inches and the moisture content increased or reduced, as necessary, to obtain the moisture content specified. This scarified layer shall then be compacted to the relative compaction specified.

All embankment material shall be compacted to not less than 95 percent relative compaction. Maximum dry density of all soil types encountered or used will be determined in accordance with AASHTO T 99 as modified by CP 23.

Soils shall be compacted at  $\pm 2$  percent of Optimum Moisture Content (OMC) as determined by AASTHO T 99. Soils having greater than 35 percent passing the 75  $\mu\text{m}$  (No. 200) sieve shall be compacted to 0 to 3 percent above OMC. Soils which are unstable at the above moisture content shall be compacted at lower moisture content to the specified density.

Additional work involved in drying embankment material to the required moisture content shall be included in the contract price paid for excavating or furnishing the material with no additional compensation.

Density requirements will not apply to materials which cannot be tested in accordance with the above procedures for determining maximum dry density. Compaction for materials which cannot be tested shall be in accordance with subsection 203.08.

Claystone or soil-like non-durable shale shall be pulverized and compacted to the specified moisture and percent of relative compaction and shall be compacted with a heavy tamping foot roller, weighing at least 30 tons. Each tamping foot roller shall protrude from the drum a minimum of 4 inches. Each embankment layer shall receive a minimum of three or more coverages with the tamping foot roller to obtain density. One coverage consists of one pass over the entire surface designated. One pass consists of the passing of an acceptable tamping foot roller over a given spot. The roller shall be operated at a uniform speed not exceeding 3 miles per hour. No additional compensation will be made for additional roller coverages to achieve specified density requirements.

In subsection 206.03, delete the fourth and fifth paragraphs and replace with the following:

Backfill shall consist of approved materials uniformly distributed in layers brought up equally on all sides of the structure. Each layer of backfill shall not exceed 6 inches before compacting to the required density and before successive layers are placed. Structure backfill (Class 1) shall be compacted to a density of not less than 95 percent of maximum dry

density determined in accordance with AASHTO T 180 as modified by CP 23. Backfill shall be compacted at  $\pm 2$  percent of Optimum Moisture Content (OMC).

Structure backfill (Class 2) shall be compacted to a density of not less than 95 percent of maximum dry density. The maximum dry density and OMC for A-1, A-2-4, A-2-5 and A-3 materials will be determined in accordance with AASHTO T 180 as modified by CP 23. The maximum dry density and OMC for all other materials will be determined in accordance with AASHTO T 99 as modified by CP 23. Materials shall be compacted at  $\pm 2$  percent of Optimum Moisture Content (OMC). Materials having greater than 35 percent passing the 75  $\mu\text{m}$  (No. 200) sieve shall be compacted at 0 to 3 percent above OMC.

In subsection 304.06, delete the first paragraph and replace with the following:

**304.06 Shaping and Compaction.** Compaction of each layer shall continue until a density of not less than 95 percent of the maximum density determined in accordance with AASHTO T 180 as modified by CP 23 has been achieved. The moisture content shall be at  $\pm 2$  percent of optimum moisture content. The surface of each layer shall be maintained during the compaction operations so that a uniform texture is produced and the aggregates are firmly keyed. Moisture conditioning shall be performed uniformly during compaction.

In subsection 613.07, delete the 15<sup>th</sup> paragraph and replace with the following:

Trenching shall be backfilled and compacted as follows: Backfill shall be deposited in uniform layers. The thickness of each layer shall be 6 inches or less thick prior to compaction. The space under the conduit shall be completely filled. The remainder of the trench and excavation shall be backfilled to the finished grade. The backfill material shall be compacted to the density of not less than 95 percent of maximum dry density. The maximum dry density and optimum moisture content (OMC) for A-1, A-2-4, A-2-5 and A-3 materials will be determined in accordance with AASHTO T 180 as modified by CP 23. The maximum dry density and OMC for all other materials will be determined in accordance with AASHTO T 99 as modified by CP 23. Materials shall be compacted at  $\pm 2$  percent of Optimum Moisture Content (OMC). Materials having greater than 35 percent passing the 75  $\mu\text{m}$  (No. 200) sieve shall be compacted at 0 to 3 percent above OMC. Each layer shall be mechanically compacted by tamping with power tools approved by the Engineer. Compaction methods or equipment that damage the conduit shall not be used.

### REVISION OF SECTION 208 AGGREGATE BAG

Section 208 of the Standard Specifications is hereby revised for this project as follows:

In subsection 208.02 delete (l) and replace with the following:

(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

Subsection 208.12 shall include the following:

<b>Pay Item</b>	<b>Pay Unit</b>
Aggregate Bag	Linear Foot

**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.

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.

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

The HSO 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 HSO is utilized, the HSO 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. The Engineer will review this submittal and approve the actual number of hours to be paid.

(b) *Monitoring Technician (MT)*. The Contractor shall designate a monitoring technician to be responsible for monitoring of hazardous substances during work on the project. The MT 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 MT 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 MT 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 MT 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 MT 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 MT shall immediately notify the Contractor, the Engineer and the HSO of any hazardous condition.

During each week the MT is utilized, the MT shall prepare a daily monitoring diary which shall be submitted to the Contractor, HSO 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. The Engineer will review this submittal and approve the actual number of hours to be paid.

- (c) *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).

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

1. General construction precautions:
  - A. All monitoring and piezometer wells and test borings shall be established or abandoned by the Contractor as regulated by the State Engineer's Office. Copies of all required permits, notification, and abandonment documents shall be submitted to the Engineer prior to payment approval.
  - B. Hazardous substance related activities shall have a work plan for each work phase which shall be coordinated with the Engineer at least three working days prior to commencement of each phase of the work.
  - C. 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.
  - D. 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, through the HSO, 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.

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) When an item coated with paint is removed, all loose paint shall be removed and collected from the item within 24 hours of the time it is removed or placed onto the ground. All loose paint shall be removed and collected from a painted item before it is removed from the site. The Contractor shall contain loose paint until it is removed and collected. Loose paint is defined as that which can be removed by manual scraping methods. Over waterways, the Contractor shall capture all paint debris by the method specified in the methods statement. The paint debris shall be collected on a daily basis and shall be stored in a properly labeled, tightly sealed container and placed in a secured location at the end of each working day.
- (f) 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.
- (g) 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.

**250.05 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.

**250.06 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.

**250.07 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 Contractor 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](mailto: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.

**250.08 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.

#### **METHOD OF MEASUREMENT**

**250.09** Environmental Health and Safety Management will not be measured, but will be paid for on a lump sum basis. 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

(5) Preparation and submittal of the final site report

The quantity to be measured for Health and Safety Officer will be the total number of hours that the Health and Safety Officer is actually used, as authorized, for the following work:

- (1) Field monitoring necessary to ensure the safety of workers on the site;
- (2) Hours in excess of the items listed under Environmental Health and Safety Management;
- (3) Hours that are necessary due to unforeseen site conditions; and
- (4) Hours of additional consultation or field work that is requested by the Engineer.

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

The quantity to be measured for Monitoring Technician will be the total number of hours that Monitoring Technician is actually used as authorized. 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 the hourly cost of the MT.

Solid stockpiled materials will be measured by the cubic yard computed from cross sections by the average end area or other requirements acceptable method. Disposal of solid waste and solid hazardous waste materials will be measured by the cubic yard in the disposal container.

Materials Sampling and Delivery will be measured by the actual number of samples collected, containerized and transported to the testing facility indicated in the Contract.

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.

## **BASIS OF PAYMENT**

**250.10** Partial payment for Environmental Health and Safety Management, as determined by the Engineer, will be made as the work progresses. The Contractor shall submit a schedule of environmental related Health and Safety Management work before the first partial payment is made. The schedule shall indicate the environmental related Health and Safety Management time for each work item that requires Contractor environmental related Health and Safety Management effort and the total time for the project.

The accepted quantity for Health and Safety Officer will be the number of hours actually used and approved for payment by the Engineer and will be paid for at the contract unit bid price.

The accepted quantity for Monitoring Technician will be the number of hours of onsite monitoring as approved by the Engineer and will be paid at the Contract unit price.

Environmental Health and Safety Management, Health and Safety Officer and 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 with subsection 109.04. Payment for Soil Handling (Stockpile) will be made at the contract unit price for all excavated material required to be stockpiled for analysis. The contract unit price will be full compensation for furnishing all materials, labor, equipment and incidentals necessary to complete this work, and all handling of the material prior to disposal. This includes haul, stockpile, and security. Payment for this work will be in addition to any payment made under other bid items for excavation, embankment or backfill on the project, or waste disposal of this material.

Payment for Solid Waste Disposal and Solid Hazardous Waste Disposal will be made at the appropriate contract unit price for the disposal of material determined to be either solid waste or solid hazardous waste. The contract unit prices will be full compensation for furnishing all materials, labor, equipment, tools, storage containers for transport, containerization of material for up to 60 days, and incidentals necessary to complete this work. This includes all handling of the material, loading for disposal, unloading for disposal, and borrow material required for replacement of excavated material disposed of offsite. It does not include stockpiling or containerization required for analysis which is included in the item Materials Handling (Stockpile & Containerization) paid for as described above. Payment for waste disposal fees and transport of hazardous waste will be made as shown below. Payment for this work will be in addition

to any payment made under other bid items for excavation, embankment, backfill or material handling (stockpile & containerization) on the project.

- (1) *Solid Waste*. Transport costs to the disposal facility and disposal fees will be included in the contract unit price for this work.
- (2) *Solid Hazardous Waste*. Transport, Disposal and /or Treatment costs will be paid for by planned force account in accordance with subsection 109.04.
- (3) *Liquid Hazardous Waste*. Transport, Disposal and /or Treatment costs will be paid for by planned force account in accordance with subsection 109.04.

The cost of shoring required to limit the removal of contaminated materials to the specified limits shall be included in the bid unit prices for any excavation to be performed. Such shoring ordered by the Engineer in areas other than the specified areas of known or potential contamination, as shown in the plans, will be paid for in accordance with subsection 109.04.

Payment for Materials Sampling and Delivery will be made at the contract unit price for each material sample collected, containerized and transported to the laboratory testing facility as designated in the Contract. The Contract unit price will be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete this work including required sampling kits, containers, sample splits and quality control samples.

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, treated or disposed under the requirements of this specification will be paid for by planned force account in accordance with subsection 109.04.

The accepted quantities will be paid for at the contract unit price for each of the pay items listed below that appear in the bid schedule.

<b>Pay Item</b>	<b>Pay Unit</b>
Environmental Health and Safety Management	Lump Sum
Health and Safety Officer	Hour
Monitoring Technician	Hour
Materials Sampling and Delivery	Each
Materials Handling (Stockpile)	Cubic Yard
Solid Waste Disposal	Cubic Yard

**REVISION OF SECTION 401  
TOLERANCES FOR HOT MIX ASPHALT (VOIDS ACCEPTANCE)**

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

In subsection 401.02(b) delete Table 401-1, including the footnotes, and replace with the following:

**Table 401-1  
Tolerances for Hot Bituminous Pavement**

<b>Element</b>	<b>Tolerance</b>
Asphalt Cement Content	± 0.3 %
Voids in the Mineral Aggregate (VMA)	± 1.2 %
Air Voids	± 1.2 %

**REVISION OF SECTION 401  
COMPACTION OF HOT MIX ASPHALT**

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

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

**401.17 Compaction.** The hot mix asphalt shall be compacted by rolling. Both steel wheel and pneumatic tire rollers will be required. The number, weight, and type of rollers furnished shall be sufficient to obtain the required density while the mixture is in a workable condition. Compaction shall begin immediately after the mixture is placed and be continuous until the required density is obtained. When the mixture contains unmodified asphalt cement (PG 58-28 or PG 64-22) or modified (PG 58-34), and the surface temperature falls below 185 °F, further compaction effort shall not be applied unless approved, provided the Contractor can demonstrate that there is no damage to the finished mat. If the mixture contains modified asphalt cement (PG 76-28, PG 70-28 or PG 64-28) and the surface temperature falls below 230 °F, further compaction effort shall not be applied unless approved, provided the Contractor can demonstrate that there is no damage to the finished mat.

Warm Mix Asphalt compaction requirements shall conform to CP 59.

In subsection 401.17, delete the third paragraph and replace with the following:

SMA shall be compacted to a density of 93 to 97 percent of the daily theoretical maximum specific gravity, determined according to CP 51. All other HMA shall be compacted to a density of 92 to 96 percent of the daily theoretical maximum specific gravity, determined according to CP 51. If more than one theoretical maximum specific gravity test is taken in a day, the average of the theoretical maximum specific gravity results will be used to determine the percent compaction. Field density determinations will be made in accordance with CP 44 or 81.

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

After production paving work has begun, a new Roller Pattern shall be demonstrated when a change in the compaction process is implemented.

**REVISION OF SECTION 401  
COMPACTION PAVEMENT TEST SECTION (CTS)**

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

In subsection 401.17, delete the fifteenth paragraph and replace with the following:

Two sets of random cores shall be taken within the last 200 tons of the CTS. Each set shall consist of seven random cores. The Engineer will determine the coring locations using a stratified random sampling process. The locations of these cores will be such that one set can serve as a duplicate of the other. One set of these cores shall be immediately submitted to the Engineer. This set will be used for determining acceptance of the CTS and determining density correction factors for nuclear density equipment. Densities of the random samples will be determined by cores according to CP 44. Density correction factors for nuclear density equipment will be determined according to CP 81. Coring shall be performed under CDOT observation. Coring will not be measured and paid for separately but shall be included in the work. For SMA, a CTS is not used. The Contractor shall follow the requirements for the demonstration control strip in accordance with the Revision of Section 403, Stone Matrix Asphalt Pavement.

**REVISION OF SECTION 401  
TEMPERATURE SEGREGATION**

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

In subsection 401.16 delete the twelfth (last) paragraph and replace it with the following:

The Engineer may evaluate the HMA for low density due to temperature segregation any time industry best practices, as detailed on Form 1346, are not being followed or the Engineer suspects temperature segregation is occurring. The Engineer will first meet with the Contractor to discuss the paving practices that are triggering the temperature investigation. Areas across the mat, excluding the outside 1 foot of both edges of the mat, that are more than 25 °F cooler than other material across the width may be marked for density testing. Material for temperature comparison will be evaluated in 3-foot intervals behind the paver across the width of the mat. The material shall be marked and tested

in accordance with CP 58. If four or more areas within a lot of 500 tons have densities of less than 93 percent of the material's maximum specific gravity for SMA mixes or less than 92 percent of the material's maximum specific gravity for all other HMA mixes, a 5 percent price disincentive will be applied to the 500 ton lot. The 500 ton count begins when the Engineer starts looking for cold areas, not when the first cold area is detected. This price disincentive will be in addition to those described in Sections 105 and 106. Only one area per delivered truck will be counted toward the number of low density areas. Temperature segregation checks will be performed only in areas where continuous paving is possible.

### **REVISION OF SECTION 412 PORTLAND CEMENT CONCRETE PAVEMENT FINISHING**

Section 412 of the Standard Specifications is hereby revised for this project as follows:

Delete subsection 412.12(a) and replace it with the following:

- (a) *Hand Finishing.* Hand finishing should be minimized wherever possible. The Engineer shall be notified prior to hand finishing work and the proposed hand finished work shall be addressed in the Quality Control Plan for concrete finishing. Unless otherwise specified, hand finishing methods will be permitted only under the following conditions. Hand finished concrete shall be struck off and screeded with a portable screed that is at least 2 feet longer than the maximum width of the slab to be struck off. It shall be sufficiently rigid to retain its shape. Concrete shall be thoroughly consolidated by hand vibrators. Hand finishing shall not be allowed after concrete has been in-place for more than 30 minutes or when initial set has begun unless otherwise approved by the Engineer. Finishing tools made of aluminum shall not be used.

The Contractor shall provide a Quality Control Plan (QCP) to ensure that proper hand finishing is accomplished in accordance with current Industry standards in the concrete pavement placement. It shall also identify the Contractor's method for ensuring that the provisions of the QCP are met. The QCP shall be submitted to the Engineer at the Preconstruction Conference. Paving operations shall not begin until the Engineer has approved the QCP. The QCP shall identify and address issues affecting the quality of finished concrete pavement including but not limited to:

- (1) Timing of hand finishing operations
- (2) Methodology to place and transport concrete
- (3) Equipment and tools to be utilized
- (4) Qualifications and training of finishers and supervisors

When the Engineer determines that any element of the approved QCP is not being implemented or that hand finished concrete is unacceptable, work shall be suspended. The Contractor shall supply a written plan to address improperly placed material and how to remedy future hand finishing failures and bring the work into compliance with the QCP. The Engineer will review the plan for acceptability prior to authorizing the resumption of operations.

### **REVISION OF SECTIONS 412, 601 AND 711 LIQUID MEMBRANE-FORMING COMPOUNDS FOR CURING CONCRETE**

Sections 412, 601 and 711 of the Standard Specifications are hereby revised for this project as follows:

In subsection 412.14, first paragraph, delete the second sentence and replace with the following:

The impervious membrane curing compound shall meet the requirements of ASTM C 309, Type 2 and shall be volatile organic content (VOC) compliant.

In subsection 601.13 (b), first paragraph, delete the second sentence and replace with the following:

A volatile organic content (VOC) compliant curing compound conforming to ASTM C 309, Type 2 shall be used on surfaces where curing compound is allowed, except that Type 1 curing compound shall be used on exposed aggregate or colored concrete, or when directed by the Engineer.

In subsection 601.16 (a) 1., delete the first sentence and replace with the following:

1. Membrane Forming Curing Compound Method. A volatile organic content (VOC) compliant curing compound conforming to ASTM C 309, Type 2 shall be uniformly applied to the surface of the deck, curbs and sidewalks at the rate of 1 gallon per 100 square feet.

Delete subsection 711.01 and replace with the following:

**711.01 Curing Materials.** Curing materials shall conform to the following requirements:

Burlap Cloth made from Jute or Kenaf	AASHTO M 182
Liquid Membrane-Forming Compounds for Curing Concrete	ASTM C 309
Sheet Materials for Curing Concrete	AASHTO M 171*
*Only the performance requirements of AASHTO M171 shall apply.	

Straw used for curing shall consist of threshed straw of oats, barley, wheat, or rye. Clean field or marsh hay may be substituted for straw when approved by the Engineer. Old dry straw or hay which breaks readily in the spreading process will not be accepted.

**REVISION OF SECTION 601  
CONCRETE SLUMP ACCEPTANCE**

Section 601 of the Standard Specifications is hereby revised for this project as follows:

Delete the fifth paragraph of Subsection 601.05 and replace with the following:

Except for Class BZ concrete, the slump of the delivered concrete shall be the slump of the approved concrete mix design plus or minus 2.0 inch. The laboratory trial mix must produce an average compressive strength at least 115 percent of the required field compressive strength specified in Table 601-1. When entrained air is specified in the Contract for Class BZ concrete, an air entraining admixture may be added to an approved Class BZ mix design. A new trial mix will not be required.

Delete Subsection 601.17 (b), 601.17 (d) and Table 601-3 and replace with the following:

- (b) *Slump.* Slump acceptance, but not rejection, may be visually determined by the Engineer. Any batch that exceeds the slump of the approved concrete mix design by 2.0 inches will be retested. If the slump is exceeded a second time, that load is rejected. If the slump is greater than 2 inches lower than the approved concrete mix design, the load can be adjusted with a water reducer, or by adding water (if the w/cm allows) and retested.

Portions of loads incorporated into structures prior to determining test results which indicate rejection as the correct course of action shall be subject to reduced payment or removal as determined by the Engineer.

- (d) *Pay Factors.* The pay factor for concrete which is allowed to remain in place at a reduced price shall be according to Table 601-3 and shall be applied to the unit price bid for Item 601, Structural Concrete.

If deviations occur in air content and strength within the same batch, the pay factor for the batch shall be the product of the individual pay factors.

**Table 601-3  
PAY FACTORS**

Percent Total Air		Strength		
Deviations From Specified Air (Percent)	Pay Factor (Percent)	Below Specified Strength (psi) [ < 4500 psi Concrete]	Pay Factor (Percent)	Below Specified Strength (psi) [ ≥ 4500 psi Concrete]
0.0-0.2	98	1-100	98	1-100
0.3-0.4	96	101-200	96	101-200
0.5-0.6	92	201-300	92	201-300
0.7-0.8	84	301-400	84	301-400
0.9-1.0	75	401-500	75	401-500
Over 1.0	Reject	Over 500	Reject	
			65	501-600
			54	601-700
			42	701-800
			29	801-900
			15	901-1000
			Reject	Over 1000

**REVISION OF SECTION 601  
CONCRETE BATCHING**

Section 601 of the Standard Specifications is hereby revised for this project as follows:

In subsection 601.06, delete (13) and (17) and replace with the following:

- (13) Gallons of water added by truck operator, the time the water was added and the quantity of concrete in the truck each time water is added.
- (17) Water to cementitious material ratio.

**REVISION OF SECTIONS 601  
CONCRETE FINISHING**

Section 601 of the Standard Specifications are hereby revised for this project as follows:

In subsection 601.12 (a) delete the fifth paragraph and replace it with the following:

Water shall not be added to the surface of the concrete to assist in finishing operations.

Hand finishing should be minimized wherever possible. The hand finishing methods shall be addressed in the Quality Control Plan for concrete finishing. Hand finished concrete shall be struck off and screeded with a portable screed that is at least 2 feet longer than the maximum width of the surface to be struck off. It shall be sufficiently rigid to retain its shape. Concrete shall be thoroughly consolidated by hand vibrators. Hand finishing shall not be allowed after concrete has been in-place for more than 30 minutes or when initial set has begun. Finishing tools made of aluminum shall not be used.

The Contractor shall provide a Quality Control Plan (QCP) to ensure that proper hand finishing is accomplished in accordance with current Industry standards. It shall identify the Contractor's method for ensuring that the provisions of the QCP are met. The QCP shall be submitted to the Engineer at the Preconstruction Conference. Concrete placement shall not begin until the Engineer has approved the QCP. The QCP shall identify and address issues affecting the quality finished concrete including but not limited to:

- (5) Timing of hand finishing operations
- (6) Methodology to place and transport concrete
- (7) Equipment and tools to be utilized
- (8) Qualifications and training of finishers and supervisors

When the Engineer determines that any element of the approved QCP is not being implemented or that hand finished concrete is unacceptable, work shall be suspended. The Contractor shall supply a written plan to address improperly placed material and how to remedy future hand finishing failures and bring the work into compliance with the QCP. The Engineer will review the plan for acceptability prior to authorizing the resumption of operations.

In subsection 601.14(a) delete the fourth paragraph.

**REVISION OF SECTION 601  
STRUCTURAL CONCRETE STRENGTH ACCEPTANCE**

Section 601 of the Standard Specifications is hereby revised for this project as follows:

In subsection 601.17 (c), delete the first paragraph and replace with the following:

- (c) *Strength (When Specified)*. The concrete will be considered acceptable when the running average of three consecutive strength tests per mix design for an individual structure is equal to or greater than the specified strength and no single test falls below the specified strength by more than 500 psi. A test is defined as the average strength of three test cylinders cast in plastic molds from a single sample of concrete and cured under standard laboratory conditions prior to testing. If the compressive strength of any one test cylinder differs from the average by more than 10 percent that compressive strength will be deleted and the average strength will be determined using the compressive strength of the remaining two test cylinders.

**REVISION OF SECTIONS 613 AND 715  
LED ROADWAY LUMINAIRE**

Sections 613 and 715 of the Standard Specifications are hereby revised for this project as follows:

In subsection 613.02, delete (e) and replace with the following:

- (e) *Luminaire*. A complete luminaire includes the housing, lens, Light Emitting Diode (LED) luminaire, luminaire housing, driver or power generator, slip-fitting clamp or approved manufacturer mounting, all necessary internal wiring, and photoelectric control. Luminaires shall operate at either 120 VAC, 60 Hz or 277 VAC, 60 Hz. Luminaires shall meet electrical utility company requirements.

In subsection 613.02 (i), delete (4), (6), (7) and (8) and replace with the following:

- (4) Luminaire manufacturer's product information including data in Illuminating Engineering Society of North America (IESNA) format, IESNA photometric distribution type for vertical and lateral distribution (example: B2-U0-G1, Type III), and a photograph or line drawing
- (6) Luminaire Lumen Range
- (7) LED Driver or Power Supply
- (8) Lighting Control Centers and Photoelectric Control Devices

Subsection 613.02 shall include the following:

- (j) *LED Luminaire Warranty*. The Contractor shall ensure that the LED Roadway Luminaire has a minimum warranty of 10 years for all parts, materials and shipping required to repair or replace the luminaire. The Contractor shall provide the manufacturer's warranty to the Engineer prior to installing the luminaire.

The warranty shall cover all failures including:

- (1) Failure in luminaire housing, wiring, connections, drivers and photoelectric control devices.
- (2) More than 10 percent decrease in lumen output
- (3) Significant change in color

The warranty shall begin upon the date the Contractor receives the luminaire. The bill of lading shall be provided to the Engineer prior to final payment of the lighting.

- (k) *Technical Support*. During the warranty period, technical support shall be available from the manufacturer via telephone within 24 hours of the time the call is made from the Contractor, and this support shall be made available from factory certified personnel or factory certified installers at no additional charge to the Department.

In subsection 613.06, delete the first paragraph and replace with the following:

**613.06 Luminaires and Lamps.** Roadway Luminaires shall be mounted on the mast arm by a slip-fitter clamp or other approved device. Luminaires shall be adjusted vertically and horizontally to provide the required orientation and maximum light distribution on the roadway and to meet Illuminating Engineering Society of North America (IESNA) TM-15 uplight rating of U0.

In subsection 613.06, delete the fourth paragraph and replace with the following:

Luminaires of the specified type and lumen output shall be installed as shown on the plans. The type and lumen output shall be marked on each luminaire or pole in accordance American National Standards Institute (ANSI) specifications. ANSI approved tags shall be provided and installed by the Contractor.

Subsection 613.12 shall include the following:

<b>Pay Item</b>	<b>Pay Unit</b>
Luminaire (LED) (___ Lumens)	Each

In subsection 715.04 (a), delete 2. and 4. and replace with the following:

2. Optical Chamber. The luminaire distribution shall be equal to or less than an Illuminating Engineering Society of North America (IES) TM15-11 Backlight Uplight and Glare (BUG) ratings listed below in Table 715-1 based on initial lumens or Light Loss Factor (LLF) = 1.0. Roadway luminaires with a U value greater than U0 shall not be accepted. The optical chamber shall be completely sealed from the housing, or the housing shall be completely sealed. A seamless one piece memory-retentive gasket shall seal the optical chamber or housing against the luminaire lens door. All wires entering the optical chamber shall be gasketed at their point of entry. Socket mountings, rivets used in the construction or support of the reflector system, and all other penetrations into the optical chamber shall be completely sealed. The optical chamber shall be water tight when the luminaire door is closed.

**Table 715-1  
BACKLIGHT, UPLIGHT AND GLARE (BUG) VALUES**

Luminaire Mounting Location	Minimum Initial Luminaire Lumen Range	Backlight (B) Rating Maximum	Uplight (U) Rating Maximum	Glare (G) Rating Maximum
Non median-mounted	Less than 5,000	B2	U0	G1
	5,000 – 22,000	B3	U0	G2
	Above 22,000*	B3	U0	G3
Median-mounted	Less than 5,000	B3	U0	G1
	5,000 – 22,000	B4	U0	G2
	Above 22,000*	B4	U0	G3
*By special application only.				

4. Electrical Components. All components shall be Underwriters Laboratory (UL) listed for wet locations or by an Occupational Safety & Health Administration Nationally Recognized Testing Laboratories (OSHA NRTL). Luminaires shall operate from 120 to 277 VAC as specified on the plans or adaptable to the type of power distribution system to be used. All internal wiring and quick disconnects shall be rated for at least 600 VAC and insulated for 302°F. The dimmable driver shall be easily removable from the luminaire housing without the use of tools. The following components shall be in accordance with corresponding sections of ANSI C136.37:
  - (1) Wiring and grounding.
  - (2) Terminal blocks for incoming AC lines.
  - (3) Photocontrol receptacle.
  - (4) Latching and hinging

In subsection 715.04, delete (b) through (e) and replace with the following:

- (b) *Roadway Luminaires*. Roadway luminaires shall be LED type with integral driver, flat lens, aluminum housing, and be UL Listed for wet locations. All luminaires for the project shall be the same type and design unless the plans specify otherwise.
  - (1) The luminaire and all components shall be UL or Intertek Testing Services (ETL) listed for Wet Location and shall have minimum Ingress Protection Rating of IP66.
  - (2) Light source shall be comprised of LED modules connected to a non-integrated driver and ready for connection to a production line luminaire. Luminaires utilizing integrated driver LED light sources, screw-based or panel retrofit products shall not be accepted.
  - (3) The luminaire shall have a Type II or III distribution for non-median mounted luminaires, and Type II, III, IV or V for median mounted luminaires.
  - (4) Transmissive optical components shall be applied in accordance with LED manufacturer's Original Equipment Manufacturer (OEM) design guidelines to ensure suitability for the environment in which the luminaire is installed.
  - (5) Luminaires shall utilize an adjustable slipfitter-type mounting system for installation on 1.25-inch (1.66-inch o.d.) to 2-inch (2.375-inch o.d.) outside diameter pipe tenons. Slipfitter shall consist of a two-piece clamp and four 9/16-inch hex bolts. Slipfitter shall allow for a vertical tilt adjustment of ± 5 percent in order to mount luminaire plumb for a U0 rating. Luminaires shall be equipped with integrated leveling bubble.
  - (6) Access to all internal parts requiring replacement shall not require tools (i.e. "tool-less entry").
  - (7) The luminaire housing shall be constructed of aluminum alloy.

- (8) Power Supply/Driver shall be provided in compliance with subsection 715.05(a). Driver must be internal and thermally separated from LED compartment.
  - (9) Dimming photocell receptacle shall conform to (d) below.
  - (10) Luminaire finish shall be corrosion resistant Super triglycidyl isocyanurate (TGIC) polyester powdercoat. Color shall be gray.
    - (i) Powder coat: Super TGIC polyester powder coat 2.5 mil nominal thickness.
    - (ii) Finish shall exceed a rating of 6 per ASTM D1654 after 1000hrs of testing per ASTM B117.
    - (iii) The coating shall exhibit no greater than 30% reduction of gloss per ASTM D523, after 500 hours of QUV testing at ASTM G154 Cycle 6.
  - (11) Effective Projected Area (EPA) for wind-loading calculations shall be no greater than 1.2 square feet.
  - (12) Luminaire weight shall not exceed 45 pounds.
  - (13) Luminaire shall be tested in accordance with IES LM79 and TM21 certifying photometric performance and rated life, respectively. LM79 (performance) and TM21 (predicted life at 55°C) testing shall both be for the same luminaire's operating drive current as specified.
  - (14) Luminaire shall have a maximum Backlight rating as shown in Table 715-1, an Uplight rating of U0, and a maximum Glare rating as shown in Table 715-1.
  - (15) Luminaire system efficacy shall be no less than 68 luminaire lumens per input watt.
  - (16) Luminaire shall have an external label per ANSI C136.15 and internal label per ANSI C136.22.
- (c) *Light Sources.* LED luminaires shall not be retrofit to existing luminaire housing; the Contractor shall replace housing along with the luminaire as a single unit. Light sources shall be compatible with dimmable drivers supplied with the luminaires in which they are to be installed. All light sources of a similar type shall be provided by the same manufacturer.

LED light sources shall meet or exceed the following requirements:

- (1) CCT, CRI and Flux:
  - (i) Correlated Color Temperature (CCT) – All LED light sources shall emit white light and have a CCT no less than 2700K nominal and no greater than 4000K nominal in accordance with ANSI C78.277.
  - (ii) Color Rendering Index (CRI) – All LED light sources shall have a minimum Color Rendering Index (CRI) of 70 per the LM79 test results.
  - (iii) Luminous Flux – LED light sources shall not exceed the junction temperature recommended by the LED manufacturer. Luminous flux differences between LEDs shall not exceed 10 percent.
- (2) LEDs shall have a minimum rated life of 70,000 hours per IES TM-21 at 55°C at the normal operating driver current for the specific luminaire. The lumen output shall be maintained at 70 percent of initial rated lumens (L70) or greater at the rated life of the luminaire.
- (3) LEDs shall be temperature rated for operation and storage within the range of -40°C to +50°C, and shall withstand low and high frequency vibration (ANSI C136.31 Vibration Level 3G) over the rated life of the light source.
- (4) Cooling System
  - (i) Mechanical design of protruding external surfaces (e.g. heat sink fins) shall facilitate hose-down cleaning and discourage debris accumulation.
  - (ii) The cooling system must be passive utilizing heat sinks, convection or conduction.
  - (iii) Fans, diaphragms, pumps, or liquids shall not be acceptable.

(d) *Photocontrol Receptacle.*

Each roadway luminaire shall be furnished with a multi-contact twist-lock outdoor lighting dimming receptacle per ANSI C136.41.

Delete subsection 715.05 and replace with the following:

**715.05 LED Drivers.** Led drivers shall conform to the following:

- (1) Dimming signal protocols are 0-10VDC or Digital Addressable Lighting Interface (DALI).

- (2) Operating voltage shall be 120/277-volt at 50/60 Hz, and shall operate normally with input voltage fluctuations of  $\pm 10$  percent, consistent with NEMA SSI-1-2010, Electronic Drivers for LED Devices, Arrays or Systems.
- (3) Minimum Power Factor (PF) shall be 0.90 at full input power and across specified voltage range.
- (4) Maximum Total Harmonic Distortion (THD) shall be 20 percent at full input power and across specified voltage range.
- (5) Factory-set drive current shall be 530mA or less unless approved by Engineer. If higher drive currents are proposed, the submittal must be accompanied with IES LM79 and TM21 test results for higher operating drive current.
- (6) Drivers shall be Restriction of Hazardous Substances (RoHS) compliant.
- (7) Rated case temperature shall conform to subsection 715.04 (c) 3.
- (8) All electronics of the power supply and the LEDs shall be protected from all electrical surges with an elevated electrical immunity rating, including but not limited to lightning strikes and stray current in rebar and concrete. Surge protection shall be integral to the LED power supply.
- (9) Luminaire, including driver, shall consume no more than 4 watts in the off state power.
- (10) Electrical immunity (including surge protection)
  - (i) Luminaire shall meet the "Elevated" requirements per IEEE C62.41.2 -2002. Manufacturer shall indicate whether failure of the electrical immunity system can possibly result in disconnect of power to luminaire.
- (11) Electromagnetic interference: Shall comply with Federal Communications Commission (FCC) 47 Code of Federal Regulations (CFR) part 15 non-consumer radio frequency interference (RFI) and/or electromagnetic interference (EMI) standards.

**REVISION OF SECTION 614  
PEDESTRIAN PUSH BUTTON POST ASSEMBLY**

Section 614 of the Standard Specifications is hereby revised for this project as follows:

Subsection 614.01 shall include the following:

This work consists of the installation of a pedestrian push button and steel post assembly at locations as shown on the plans.

Subsection 614.02 shall include the following:

Post for pedestrian push button shall be tubular steel, Schedule 80.

Concrete for foundation shall be Class B.

Pedestrian push button and sign shall meet all ADA requirements.

Wiring for pedestrian push button shall conform to manufacturer recommendations.

Subsection 614.02 shall include the following:

Steel posts and slip base assembly shall be galvanized in accordance with Section 509, unless painting is called for on the plans. Painting shall be in accordance with Section 522, Duplex Coating System. The post and slip base shall be constructed as shown on the plans.

Subsection 614.13 shall include the following:

Pedestrian Push Button Post Assembly will be measured as the actual number that are installed and accepted.

614.14 shall include the following:

<b>Pay Item</b>	<b>Pay Unit</b>
Pedestrian Push Button Post Assembly	Each

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

**REVISION OF SECTION 614  
ACCESSIBLE PEDESTRIAN SIGNAL**

Section 614 of the Standard Specifications is hereby revised for this project to include the following:

**DESCRIPTION**

This work consists of the construction of an accessible pedestrian signal at locations as shown on the plans.

**MATERIALS**

The Accessible Pedestrian Signal (APS) shall be an audible-tactile pedestrian signal system and shall consist of all electronic control equipment, mounting hardware, push buttons and signs designed to provide both a pushbutton with a raised, vibrating tactile arrow on the button as well as a variety of audible indications for differing pedestrian signal functions.

The APS shall meet the following requirements:

- (1) 2009 Manual of Uniform Traffic Control Devices (MUTCD), Chapter 4E – Pedestrian Control Features.
- (2) NEMA TS 2 Section 2.1 requirements for Temperature and Humidity, Transient Voltage Protection and Mechanical Shock and Vibration.
- (3) IEC 61000-4-4; 4-5 Transient Suppression requirements.
- (4) FCC Title 47, Part 15, Class A, Electronic Noise requirements.

The APS pushbutton enclosure shall meet the NEMA 250 – Type 4X enclosure requirement.

Upon installation the APS shall have the following functional requirements:

(a) *APS functional requirements.* The APS shall have the following functional features:

- (1) The APS shall be programmable and adjustable. Programming and adjustments shall be made using a laptop computer or vendor supplied programmer. No additional hardware or equipment shall be required. The APS shall be fully compatible with the three latest versions of the Windows operating platform. The programmable features shall be:
  - A. Push-button locator tone
  - B. Walk and Wait audible message
  - C. Audible push-button informational message
  - D. Audible crossing beacon
  - E. Vibrating tactile arrow
  - F. Independent minimum and maximum volume limits for the Locator Tone, Walk and Audible Beaconing features.
- (2) All audible features shall emanate from the pedestrian pushbutton housing. The APS shall utilize digital audio technology, having a minimum 12-bit sample at a 16k Hz sample rate. Total harmonic distortion shall be less than 3 percent at 75 decibels. The APS shall provide independent ambient sound adjustment for the Locator Tone feature. The APS shall allow for Locator Tone volume to be set below the ambient noise level. The system shall have, at a minimum, three programmable locator tones. All sound levels shall adjust automatically utilizing an internally mounted, interval ambient sensing microphone, in accordance with the MUTCD.
- (3) The APS shall monitor the Walk condition for conflict operation. As a standalone unit, the APS shall disable the Walk functionality should a conflict be detected.
- (4) The APS system shall log cumulative call data. The data shall be date and time stamped, and shall be accessible via laptop.
- (5) The system shall have a programmable Extended Push Activation feature with the ability to extend the Walk time and provide an informational audible message. Activation shall be programmable from one to six seconds.
- (6) The system shall provide a programmable audible Wait message when the button is pushed. The message shall only announce once per actuation.

(b) *Power Control Unit (PCU):*

- (1) The PCU shall be mounted in the pedestrian signal head and shall be powered by the activation of Walk or Don't Walk using 120 Volts Alternating Current (VAC).
- (2) The PCU shall utilize separate power inputs for Walk and Don't Walk. The PCU shall not require more than four wires from the PCU to the corresponding push button.
- (3) The voltage at the push button shall not exceed 24 VAC.

(c) *Push Button Assembly (PBA):*

- (1) The PBA shall be a single assembly containing an ADA compliant, vibro-tactile, directional arrow button, weatherproof audible speaker and informational sign with optional placard braille messages. The PBA shall housing shall not incorporate any plastic or polycarbonate parts.
- (2) The PBA tactile arrow shall be 2 inches in length and shall be field adjustable to two directions.
- (3) The pushbutton shall utilize Piezo switch technology rated at greater than twenty million operations. Vibro-tactile operation shall pulse at 20 Hz with a minimum 0.003-inch displacement against a 2 pound applied force.
- (4) The PBA assembly shall be capable of mounting on a curved or flat surface utilizing either machine screws or bolts or banding type mounting hardware. The PBA shall accommodate mounting to a minimum 2-inch diameter pole.

### CONSTRUCTION REQUIREMENTS

Prior to start of the installation of the APS, The Contractor shall submit a sample unit for testing. Installation of the APS shall not begin until written approval of the sample has been received from the Engineer. If the unit fails to pass testing, the Contractor shall repair or replace the subsequent units at his expense.

A field test of a single APS shall be performed in the presence of the Engineer. All repairs or replacements required to ensure a fully operational system shall be at the Contractor's expense.

The APS shall be installed in accordance with manufacturer's recommendations.

### METHOD OF MEASUREMENT

The Accessible Pedestrian Signal (APS) will be measured as the actual number that are installed and accepted.

### BASIS OF PAYMENT

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Accessible Pedestrian Signal	Each

Payment will be full compensation for all work, materials and equipment required to install a fully operational APS in accordance with these specifications.

The sample APS will not be measured and paid for separately, but shall be included in the work.

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

**REVISION OF SECTION 630  
RETROREFLECTIVE SIGN SHEETING**

Section 630 of the Standard Specifications is hereby revised for this project as follows:

In subsection 630.02, delete the sixth and seventh paragraphs, including Table 630-1, and replace them with the following:

Retroreflective sheeting for all signs requiring an orange background shall be Type VI or Type Fluorescent.

Retroreflective sheeting for all signs requiring a yellow background shall be Type Fluorescent.

**Table 630-1  
RETROREFLECTIVE SHEETING TYPES**

Sheeting	Type IV	Type VI (Roll-up sign material)	Type Fluorescent <sup>1</sup>
Application	Work Zone	Work Zone	Work Zone
All Orange Construction Signs			X
Orange Construction Signs that are used only during daytime hours for short term or mobile operations		X <sup>4</sup>	X
Barricades (Temporary)	X		X
Vertical Panels	X		X
Flaggers Stop/Slow Paddle	X		X
Drums <sup>2</sup>	X		X
Non-orange Fixed Support signs with prefix "W"	X		
Special Warning Signs			X
STOP sign (R1-1) YIELD sign (R1-2) WRONG WAY sign (R5-1a) DO NOT ENTER sign (R5-1) EXIT sign (E5-1a)	X		
DETOUR sign (M4-9) or (M4-10)			X
All other fixed support signs <sup>3</sup>	X		X
All other signs used only during working hours	X		X
All other signs that are used only during daytime hours for short term or mobile operations	X	X <sup>5</sup>	X

- 1 Fluorescent Sheeting shall be of a brand that is on the CDOT Approved Products List.
- 2 Drum Sheeting shall be manufactured for flexible devices.
- 3 Fixed support signs are defined as all signs that must remain in use outside of working hours. They shall be mounted in accordance with Standard Plan S-630-1.
- 4 RS 24 only.
- 5 White only.

## REVISION OF SECTION 702 BITUMINOUS MATERIALS

Section 702 of the Standard Specifications is hereby deleted for this project and replaced with the following:

### 702.01 Asphalt Cements.

(a) *Superpave Performance Graded Binders.* Superpave Performance Graded Binders shall conform to the requirements listed in Table 702-1. (Taken from AASHTO M 320)

Asphalt cement shall not be acid modified or alkaline modified.

Asphalt cement shall not contain any used oils that have not been re-refined. Modifiers that do not comply with environmental rules and regulations including 40 CFR Part 261.6(a) (3) (IV), and part 266/Subpart C shall not be added. Modifiers shall not be carcinogenic.

The supplier of the PG binder shall be certified in accordance with CP 11.

## REVISION OF SECTION 703 CONCRETE AGGREGATES

Section 703 of the Standard Specifications is hereby revised for this project as follows:

Delete the second paragraph of subsection 703.00 and Table 703-1.

Delete subsections 703.01 and 703.02 and replace with the following:

**703.01 Fine Aggregate for Concrete.** Fine aggregate for concrete shall conform to the requirements of AASHTO M 6, Class A. The minimum sand equivalent, as tested in accordance with Colorado Procedure 37 shall be 80 unless otherwise specified. The fineness modulus, as determined by AASHTO T 27, shall not be less than 2.50 or greater than 3.50 unless otherwise approved.

**703.02 Coarse Aggregate for Concrete.** Coarse aggregate for concrete shall conform to the requirements of AASHTO M 80, Class A aggregates, except that the percentage of wear shall not exceed 45 when tested in accordance with AASHTO T 96.

## REVISION OF SECTION 703 AGGREGATES FOR HOT MIX ASPHALT

Section 703 of the Standard Specifications is hereby revised for this project as follows:

Delete subsection 703.04 and replace with the following:

**703.04 Aggregates for Hot Mix Asphalt.** Aggregates for hot mix asphalt (HMA) shall be of uniform quality, composed of clean, hard, durable particles of crushed stone, crushed gravel, natural gravel, or crushed slag. Excess of fine material shall be wasted before crushing. A percentage of the aggregate retained on the 4.75 mm (No. 4) sieve for Gradings S, SX and SG— and on the 2.36 mm (No. 8) sieve for Gradings SF and ST—shall have at least two mechanically induced fractured faces when tested in accordance with Colorado Procedure 45. This percentage will be specified in Table 403-1, as revised for the project in Section 403. The angularity of the fine aggregate shall be a minimum of 45.0 percent when determined according to AASHTO T 304. Grading SF mixes, when determined by RME, may not require fine aggregate angularity of 45.0 percent. Aggregate samples representing each aggregate stockpile shall be non-plastic if the percent of aggregate passing the 2.36 mm (No. 8) sieve is greater than or equal to 10 percent by weight of the individual aggregate sample. Plasticity will be determined in accordance with AASHTO T 90. The material shall not contain clay balls, vegetable matter, or other deleterious substances.

The aggregate for Gradings ST, S, SX and SG shall have a percentage of wear of 45 or less when tested in accordance with AASHTO T 96.

**Table 703-4  
MASTER RANGE TABLE FOR HOT MIX ASPHALT**

Sieve Size	Percent by Weight Passing Square Mesh Sieves				
	Grading SF**	Grading ST	Grading SX	Grading S	Grading SG
37.5 mm (1½")					100
25.0 mm (1")				100	90 – 100
19.0 mm (¾")			100	90 – 100	
12.5 mm (½")		100	90 – 100	*	*
9.5 mm (⅜")	100	90 – 100	*	*	*
4.75 mm (#4)	90 – 100	*	*	*	*
2.36 mm (#8)	*	28 – 58	28 – 58	23 – 49	19 – 45
1.18 mm (#16)	30 – 54				
600 µm (#30)	*	*	*	*	*
300 µm (#50)					
150 µm (#100)					
75 µm (#200)	2 – 12	2 – 10	2 – 10	2 – 8	1 – 7

\* These additional Form 43 Specification Screens will initially be established using values from the As Used Gradation shown on the Design Mix.

\*\*SF applications are limited and the CDOT Pavement Design Manual should be referenced, prior to use.

Aggregates for stone matrix asphalt (SMA) shall be of uniform quality, composed of clean, hard, durable particles of crushed stone, crushed gravel, or crushed slag. A minimum of 90 percent of the particles retained on the 4.75 mm (No. 4) sieve shall have at least two mechanically induced fractured faces when tested in accordance with Colorado Procedure 45. The particles passing the 4.75 mm (No. 4) sieve shall be the product of crushing rock larger than 12.5 mm (½ inch) and shall be non-plastic when tested in accordance with AASHTO T 90.

Additionally, each source of aggregate for SMA shall meet the following requirements:

- (1) No more than 30 percent when tested in accordance with AASHTO T 96 Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
- (2) No more than 12 percent when tested in accordance with AASHTO T 104 Soundness of Aggregate by Use of Sodium Sulfate.

The aggregate for Hot Mix Asphalt (HMA) shall meet the requirements of Table 703-4A when tested in accordance with CP-L 4211 Resistance of Coarse Aggregate to Degradation by Abrasion in the Micro-Deval Apparatus. The Contractor shall be assessed a price reduction of \$1000 for each production sample of the combined aggregate with a value greater than 20 according to CP-L 4211.

**Table 703-4A  
AGGREGATE DEGRADATION BY ABRASION  
IN THE MICRO-DEVAL CP-L 4211**

	<b>Not to exceed</b>
Combined Aggregate (Mix Design)	18
Combined Aggregate (1/10,000 tons, or fraction thereof during production)	20

**REVISION OF SECTION 712  
WATER FOR MIXING OR CURING CONCRETE**

Section 712 of the Standard Specifications is hereby revised for this project as follows:

Delete subsection 712.01 and replace it with the following:

**712.01 Water.** Water used in mixing or curing concrete shall be reasonably clean and free of oil, salt, acid, alkali, sugar, vegetation, or other substance injurious to the finished product. Concrete mixing water shall meet the requirements of ASTM C1602. The Contractor shall perform and submit tests to the Engineer at the frequencies listed in ASTM C1602. Potable water may be used without testing. Where the source of water is relatively shallow, the intake shall be so enclosed as to exclude silt, mud, grass, and other foreign materials.

**REVISION OF SECTION 713  
SIGN PANEL BACKGROUNDS**

Section 713 of the Standard Specifications is hereby revised for this project as follows:

In subsection 713.04, delete the third paragraph and replace with the following:

The aluminum sign blanks shall receive a chemical treatment conforming to ASTM B 449, Class 2 or ASTM B921 prior to placement of reflective sheeting.

**REVISION OF SECTION 713  
EPOXY PAVEMENT MARKING**

Section 713 of the Standard Specifications is hereby revised for this project as follows:

Delete subsection 713.17 and replace with the following:

**713.17 Epoxy Pavement Marking Material.** Only epoxy pavement marking material that is on the Department's Approved Products List may be used. Batches or lots of approved products will be accepted on the project by certified test report (CTR). The CTR shall confirm that the material meets all CDOT requirements and is the same material that was preapproved in the product evaluation process.

- (a) *Formulation.* Epoxy pavement marking material shall be a two component, 100 percent solids, material formulated to provide simple volumetric mixing ratio of two volumes of component A and one volume of component B unless otherwise recommended by the material manufacturer.
- (b) *Composition.* The component A of both white and yellow shall be within the following limits:

**Resin / Pigment Components (% by Weight)**

<b>Pigment</b>	<b>WHITE:</b>	<b>YELLOW:</b>
TiO <sub>2</sub> , ASTM D476, Type II	18-25	10-17
Organic Yellow		6-10
Epoxy Resin	75-82	73-84

The pigment for yellow epoxy shall contain no lead or other material such that the cured epoxy could be considered a hazardous waste under EPA or CDPHE regulations. The Contractor shall submit to the Engineer a manufacturer's certification of compliance with this requirement.

- (c) *Epoxy Number.* The epoxy number of the epoxy resin shall be the manufacturers target value  $\pm$  50 as determined by ASTM D 1652 for white and yellow component A on pigment free basis.
- (d) *Amine Number.* The amine number on the curing agent (component B) shall be the manufacturers target value  $\pm$  50 per ASTM D 2071.
- (e) *Toxicity.* Upon heating to application temperature, the material shall not produce fumes which are toxic or injurious to persons or property.

(f) *Color.* The epoxy material, without drop-on beads, shall correspond following requirements:

White – Federal Standard No. 595B-17925. The Yellowness Index (YI) of white shall not exceed 8.0 per ASTM E-313-10 initially.

After 72 QUV exposure per ASTM G-154 with a UVA-340 Lamp at an irradiance of 0.89 W/m<sup>2</sup>/nm with alternating cycles of 4 hours U.V @ 140° F, and 4 hours humidity @ 122° F the YI shall not exceed 20 when measured per ASTM E-313.

The YI, after 500-hour QUV testing as above, shall not exceed 35.

Yellow – Materials for pavement markings shall meet the initial daytime chromaticity that fall within the box created by the following corner points:

**Initial Daytime Chromaticity Coordinates (Corner Points)**

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
x	0.530	0.510	0.455	0.472
y	0.456	0.485	0.444	0.400

After 72-hour QUV exposure per ASTM G-154 with a UVA-340 Lamp at an irradiance of 0.89 W/m<sup>2</sup>/nm with alternating cycles of 4 hours U.V @ 140° F, and 4 hours humidity @ 122° F the Yellow shall fall within the initial chromaticity coordinates stated above.

- (g) *Drying Time.* The epoxy pavement marking material shall have a setting time to a no-tracking condition of not more than 25 minutes at a temperature of 73° F and above.
- (h) *Curing.* The epoxy material shall be capable of fully curing under the constant surface temperature condition of 35° F and above.
- (i) *Adhesion to Concrete.* The catalyzed epoxy pavement marking material, when tested according to ACI Method 503, shall *have* such a high degree of adhesion to the specified (4000 psi minimum) concrete surface that there shall be a 100 percent concrete failure in the performance of this test
- (j) *Hardness.* The epoxy pavement marking materials, when tested according to ASTM D 2240, shall have a minimum Shore D Hardness value of 80. Samples shall be allowed to cure at room temperature, 75 ± 2 °F for a minimum of 72 hours and a maximum of 168 hours prior to performing the indicated test.
- (k) *Abrasion Resistance.* The abrasion resistance shall be evaluated on Taber Abrader with a 1000 gram load and CS-17 wheels. The duration of the test shall be 1000 cycles. The wear index shall be calculated based on ASTM test method C-501 and the wear index for the catalyzed material shall not be more than 80. The tests shall be run on cured samples of material which have been applied at film thickness of 15 ± ½ mils to code S-16 stainless steel plates. The samples shall be allowed to cure at 75 ± 2 °F for a minimum of 72 hours prior to performing the indicated tests.
- (l) *Tensile Strength.* When tested according to ASTM D 638, the epoxy pavement marking materials shall have a tensile strength of not less than 6000 psi. The Type IV Specimens shall be cast in a suitable mold and pulled at the rate of ¼ inch per minute by a suitable dynamic testing machine. The samples shall be allowed to cure at room temperature (75 ± 2 °F) for a minimum of 72 hours and a maximum of 168 hours prior to performing the indicated tests.
- (m) *Compressive Strength.* When tested according to ASTM D 695, the catalyzed epoxy pavement marking materials shall have a compressive strength of not less than 12,000 psi. The cast sample shall be conditioned at room temperature, 75 ± 2 °F, for a minimum of 72 hours and a maximum of 168 hours prior to performing the tests. The rate of compression of these samples shall be no more than ¼ inch per minute.

## RENEWAL WHEAT RIDGE SPECIAL PROVISIONS

The CDOT Standard Specifications and Standard Special Provisions are modified with the following Renewal Wheat Ridge Special Provisions.

### REVISION OF SECTION 101 DEFINITIONS AND TERMS

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

Delete subsection 101.10 and replace with the following:

**101.10 Executive Director.** The Executive Director for Renewal Wheat Ridge, or his duly authorized representative, who is responsible for activities by Renewal Wheat Ridge. The Executive Director is responsible for final decisions relating to Contractor claims for change orders, additional compensation, or extensions of contract time. All references to “CDOT Resident Engineer” shall be replaced by “Executive Director”.

In subsection 101.17 delete the first paragraph and replace with the following:

The written agreement between Renewal Wheat Ridge and the Contractor setting forth the obligations of the parties for the performance of the work and the basis of payment.

Delete subsection 101.23 Contractor.

Delete subsection 101.28 and replace with the following:

**101.28 Department.** Renewal Wheat Ridge. An urban renewal authority for the City of Wheat Ridge.

Delete subsection 101.29 and replace with the following:

**101.29 Manager.** The Economic Development Manager of the Department acting directly or through an authorized representative, who is responsible for engineering and administrative supervision of the project. For the purpose of these specifications, the Manager is responsible for initial decisions relating to Contractor claims for additional compensation or additional time. The Manager is the sole City representative who may approve modifications to Contract documents or drawings.

Delete subsection 101.36 and replace with the following:

**101.36 Holidays.** Holidays recognized by Renewal Wheat Ridge are:

- New Years Day
- Martin Luther King, Jr. Day
- Presidents' Day
- Memorial Day
- Independence Day
- Labor Day
- Veterans' Day
- Thanksgiving Day
- Day after Thanksgiving Day
- Christmas Day

When New Year's Day, Independence Day, or Christmas Day fall on Sunday, the following Monday shall be considered a holiday.

When New Year's Day, Independence Day, or Christmas Day fall on Saturday, the previous Friday shall be considered a holiday.

Additional legal holidays, when designated by the Governor or the President of the United States will also be recognized by Renewal Wheat Ridge.

Delete subsection 101.37 and replace with the following:

**101.37 Inspector.** The Project Engineer's authorized representative assigned to make detailed inspections of contract performance and is responsible for coordinating administration and satisfactory completion of the project with the Project Engineer.

Delete subsection 101.48 and replace with the following:

**101.48 Preconstruction Conference.** A meeting of Renewal Wheat Ridge project personnel, Contractor project personnel, and other stake holders held prior to the beginning of construction at which topics pertinent to the successful prosecution of the work are discussed.

Delete subsection 101.51 and replace with the following:

**101.51 Project Engineer.** The Manager's duly authorized representative who may be a City employee or an employee of a consulting engineer (consultant) under contract to Renewal Wheat Ridge as defined below:

- (a) *City Project Engineer.* The City employee who is the Manager's duly authorized representative. The City Project Engineer is in direct charge of the work and is responsible for the administration and satisfactory completion of the project under contract.
- (b) *Consultant Project Engineer.* The consultant employee under the responsible charge of the consultant's Professional Engineer who is in direct charge of the work and is responsible for the administration and satisfactory completion of the project. The Consultant Project Engineer's duties are delegated by the Engineer in accordance with the scope of work in the consultant's contract with Renewal Wheat Ridge. The Consultant Project Engineer is not authorized to sign or approve Contract Modification Orders.

Delete subsection 101.58 and replace with the following:

**101.58 Region Transportation Director.** All references to "Region Transportation Director" shall be replaced by "Executive Director".

Delete subsection 101.59 and replace with the following:

**101.59 Right of Way.** A general term denoting land, property, or interest therein, usually in a strip, acquired for or devoted to a highway, street, alley, or other access.

Delete subsection 101.81 Subcontractor.

Add subsections 101.96 – 101.105 as follows:

**101.96 Approved Equal.** A product, component or process whose use in or on a particular project is specified as a standard for comparison purposes only. The "equal" product, component or process shall be the same or better than that named in function, performance, reliability, quality, and general configuration. Determination of equality in reference to the project design requirements will be made by the Manager. It is the responsibility of the supplier to provide all necessary information for determining equality.

**101.97 Bid Bond.** The security required to be submitted with each proposal as described in Section 101.52 as a Proposal Guaranty.

**101.98 Contract Change Order.** Same as Contract Modification Order, subsection 101.19.

**101.99 Easement.** The right to use a defined area of property for a specific purpose or purposes as set forth in a document which has been made a part of the Contract Documents.

**101.100 Lump Sum.** A method of payment providing for one all inclusive cost for the work or for a particular portion of the work; including any incidental costs necessary to perform that item of work.

**101.101 Notice of Award.** A written notice of acceptance of the bid from Renewal Wheat Ridge to the successful bidder.

**101.102 Owner.** The legal entity or contracting agency for which the work is being performed, herein defined as Renewal Wheat Ridge. The words Renewal Wheat Ridge and Owner are used interchangeably within this document.

**101.103 Payment Bond.** Same as Contract Payment Bond, subsection 101.20.

**101.104 Performance Bond.** Same as Contract Performance Bond, subsection 101.21

**101.105 Utility.** Tracks, overhead or underground wires, pipelines, conduits, pipes, ducts or structures, owned, operated or maintained in or across a public right-of-way or easement.

## **REVISION OF SECTION 102 BIDDING REQUIREMENTS AND CONDITIONS**

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

Delete subsection 102.01 and replace with the following:

**102.01 Prequalification of Bidders.** Renewal Wheat Ridge does not prequalify bidders. Each Contractor is required to complete the Contractors Qualification Form included in the Bid Package.

Delete subsection 102.04 and replace with the following:

**102.04 Interpretation of Plans and Specifications.** If it should appear to a Bidder that the work to be done or matters relative thereto are not sufficiently described or explained in the Contract Documents or that the Contract Documents are not definite and clear, the Bidder may make written inquiry regarding same to the City Purchasing Agent at least five (5) days before the scheduled closing time for filing bids.

Then, if in the judgment of Renewal Wheat Ridge, additional information or interpretation is necessary, such information will be supplied in the form of an addendum. Each addendum will be delivered where possible by FACSIMILE MACHINE (FAX) or ELECTRONIC MAIL (EMAIL) to all individuals, firms and corporations who have acknowledged receipt of Bid Document Sets. Such addendum shall have the same binding effect as though contained in the main body of the Contract Documents. **ORAL INSTRUCTIONS OR INFORMATION CONCERNING THE CONTRACT DOCUMENTS OR THE PROJECT GIVEN OUT BY OFFICERS, EMPLOYEES OR AGENTS OF THE OWNER TO PROSPECTIVE BIDDERS SHALL NOT BIND THE OWNER.** If no request is made in the five days, Bidder waives right to any conflict in the Contract Documents.

Subsection 102.05 shall include the following:

Final determination of underground or other conditions is left to the Bidder without recourse to Renewal Wheat Ridge.

Delete subsection 102.06 and replace with the following:

**102.06 Preparation of Proposal.** The bidder shall submit his proposal upon the forms supplied by the Owner. The bidder shall specify a unit price in words or figures, or both if required, for each pay item for which a quantity is given and shall also show the products to the respective unit prices and quantities written in figures in the column provided for that purpose and the total amount of the proposal obtained by adding the amounts of the separate items. All the words and figures shall be in ink or type. In case of a mathematical error, the unit price shall govern.

When an item in the proposal contains a choice to be made by the bidder, the bidder shall indicate his choice in accordance with the specifications for that particular item, and thereafter no further choice will be permitted.

The bidder's proposal must be signed in ink by the individual, by one or more members of the partnership, by two officers of a corporation or by an agent of the contractor legally qualified and acceptable to Renewal Wheat Ridge.

If the proposal is made by an individual, his name and post office address must be shown, by a partnership, the name and address of each partner must be shown, by a corporation, the name of the corporation and the business address of its corporate officials must be shown.

In subsection 102.07 delete paragraphs (7) and (9)

Delete subsection 102.09 and replace with the following:

**102.09 Anti-Collusion Affidavit.** Every Proposal (bid) submitted to Renewal Wheat Ridge shall contain a statement certifying that the Bidder has not participated in any collusion or taken any action in restraint of free competitive bidding. This statement shall be in the form of an affidavit provided by the City and included in the Bid Form. **The Bidder's Proposal will be rejected if it does not contain the completed Noncollusion Affidavit.**

Add subsections 102.11 – 102.14 as follows:

**102.11 Disqualification of Bidders.** Any of the following reasons may be considered as being sufficient for the disqualification of a bidder and the rejection of his proposal or proposals:

- (1) More than one proposal for the same work from an individual, firm, or corporation under the same or different name.
- (2) Evidence of collusion among Bidders. Participants in such collusion will not receive recognition as Bidders for any future work of Renewal Wheat Ridge until any such participant shall have been reinstated as a qualified Bidder.
- (3) If, during a Contract with Renewal Wheat Ridge, a Contractor or Subcontractor incurs liquidated damages as described in subsection 108.09, he shall be disqualified for a period of one (1) year from the date of final acceptance of that Contract.

**102.12 Bid Prices.** Bidders must include, in their bid prices, the entire cost of each item of the work set forth in the proposal, and it is understood and agreed that there is included, in each lump sum or unit price bid, the entire cost of materials and labor incidental or necessary to the completion of that portion of the work covered, unless such work is expressly included in other lump sum or unit price bids in the proposal. Since the bid information cannot be guaranteed, the Contractor shall have assumed the risks attendant to successful performance of the work at the amount of the bid.

**102.13 Rejection of Bids.** The Owner reserves the right to reject any or all bids and waive irregularities not affecting substantial rights.

### **REVISION OF SECTION 103 AWARD AND EXECUTION OF CONTRACT**

Section 103 of the CDOT Standard Specifications is hereby revised for this project as follows:

Delete subsection 103.01 and replace with the following:

**103.01 Consideration of Proposals.** After the proposals are opened and read, they will be compared on the basis of the summation of the products of the approximate quantities shown in the bid schedule by the unit prices.

The Owner reserves the right to settle bid discrepancies that occur in the low Bidder's proposal at the time the Contract is awarded. Bid discrepancies will be settled with the understanding that the low Bidder waives any claims against Renewal Wheat Ridge because of Bidder's mistakes in the Bid Proposal.

In subsection 103.02 change the time of award from 30 calendar days to 60 calendar days.

Subsection 103.04 shall include the following:

Failure to execute the Contract and file acceptable bonds within 14 days after the date of award shall be just cause for the cancellation of the award and the forfeiture of the proposal guaranty which shall become the property of Renewal Wheat Ridge.

The Executive Director \ may elect to waive forfeiture of the proposal guaranty only if it is determined that the bidder has made a good faith remedial error and that no damages were sustained by Renewal Wheat Ridge as a result of the failure by the successful bidder to execute the Contract and file acceptable bonds within the time prescribed. Award may then be made to the next lowest responsible bidder, or the work may be readvertised and constructed under Contract or otherwise as Renewal Wheat Ridge may decide.

Add subsections 103.05 – 103.06 as follows:

**103.05 Cancellation of Award.** Renewal Wheat Ridge reserves the right to cancel the award of any Contract at any time before the execution of said Contract by all parties without liability against Renewal Wheat Ridge.

**103.06 Return of Proposal Guaranty.** All proposal guaranties consisting of bid bonds will be retained by the City. All proposal guaranties in the form of certified checks or cashiers checks will be treated as follows:

For the three lowest Bidders, the proposal guarantee will be held until the Contract is awarded to the successful bidder. Proposal guaranty will then be returned to the other Bidders. The proposal guaranty of the successful Bidder will be returned upon receipt of executed Contract and approved payment and performance bonds.

In subsection 103.02 change all time period references from 15 days to 14 days in Sec. 103.04 Execution and Approval of Contract.

#### **REVISION OF SECTION 104 SCOPE OF WORK**

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

Subsection 104.04 shall include the following:

The Contractor shall be responsible for maintaining access to all residences and businesses along the Project areas during construction. Lane widths during construction shall not be less than 10 ft and a minimum clearance of two feet shall be maintained between traffic and the construction work zone.

The Contractor will not be permitted to have construction equipment or materials in the lane(s) open to traffic at any time unless permitted by the Engineer.

The Contractor is cautioned that all personal vehicle and construction equipment parking will be prohibited where it conflicts with safety, access, or the flow of traffic.

#### **REVISION OF SECTION 105 CONTROL OF WORK**

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

In subsection 105.02 (b) 4. change the base number of submission sets of shop drawings from six to four.

Subsection 105.02 (f) shall include the following:

1. All Contractors who construct public storm drainage systems, bike paths, sidewalks, streets, or other items within Public property to be maintained by the City must submit an "As Constructed" set of construction drawings for approval as a part of Renewal Wheat Ridge's acceptance process. The initial submittal shall be one set of "red-lined" marked up prints, which should be delivered to the Department of Public Works counter at City Hall, attention "Engineering Manager". Written Renewal Wheat Ridge acceptance of the final As Constructed plan is a condition for final acceptance and release of retainage.

As Constructed plans for construction of irrigation systems within public property to be maintained by the City shall be submitted per subsection 623.25.

2. All As Constructed information shall be red-lined and shown on the original construction drawings. The As Constructed drawings shall clearly show any changes or variations from the approved design. Horizontal variations greater than 1.0 foot should be shown dimensionally or through plus stations. Horizontal variations greater than 10.0 feet should also show the graphic relocation of the object. For construction of public storm drainage systems, vertical elevation variations greater than 0.1 feet shall be provided for all shown design elevations. For construction of all remaining project features, vertical elevation variations greater than 0.25 feet shall be provided for all shown design elevations.

3. The As Constructed Certificate (shown below) shall be signed and sealed by a CO professional land surveyor and shall appear on the cover sheet of the As Constructed plan set. All sheets included in the Contract Drawings set must be submitted in the final As Constructed plan set.

AS CONSTRUCTED CERTIFICATE

I hereby certify that the information shown on this as constructed drawing is an accurate and complete representation of data established from field information obtained under the direction of a Professional Engineer or Professional Land Surveyor, and that the physical dimensions or elevations shown are as-built information and the facility was constructed according to the approved plans, except as otherwise noted hereon.

_____	_____
Name	License #
_____	_____
Title	Date

In subsection 105.03 change the first sentence of the seventh paragraph as follows:

Materials may be sampled and tested at the discretion of the City in accordance with the City Permit Testing and Inspection Requirements Document, available at the City Public Works counter, and CDOT's Field Materials Manual.

In subsection 105.09 (a) change the order of precedence as follows:

1. Renewal Wheat Ridge General Provisions
2. Renewal Wheat Ridge Special Provisions
3. Project Special Provisions
4. Standard Special Provisions

Subsection 105.09 shall include the following:

Any discrepancy or error discovered in the Drawings, Specifications, or during field construction shall be immediately called to the attention of the Manager through submission of a "Request for Information" (RFI) document. Only the Manager may authorize a modification to the project drawings or specifications via written response to an RFI. Neither the Inspector or Project Engineer may authorize alterations, in-field changes, or modifications to the project, whether orally or written, unless said change is so minor in nature that grades, horizontal geometry, detail, or the original purpose and intent of the drawings are not altered. Concurrence by the Inspector, Project Engineer, or any other Renewal Wheat Ridge or City representative in the field or on the daily inspection report does not constitute approval of any element of the project. The Contractor is solely responsible for constructing the project according to the project drawings and specifications.

Subsection 105.10 shall include the following:

Not furnishing a competent superintendence will be grounds for suspension of the Project until such superintendence is furnished by the Contractor. **CONTRACT TIME WILL CONTINUE IN THE EVENT OF A WORK SUSPENSION CAUSED BY LACK OF FURNISHING FULL TIME PROJECT SUPERINTENDENCE SATISFACTORY TO RENEWAL WHEAT RIDGE.**

Subsection 105.11 shall include the following:

The locations of all utilities shown on the project plans should be considered approximate. It is therefore the responsibility of the Contractor to notify the appropriate utility and/or utility locating service to obtain more precise locations. No compensation will be made to the Contractor for any damage, delay or additional cost incurred as a result of failure to obtain utility locations.

Utilities which are adjusted, removed, or reset for the construction convenience of the Contractor and which would not conflict with the line or grade of the proposed project works, shall be done at the Contractor's expense. This shall include, but not be limited to, sewer service lines, water service lines, telephone, gas and electrical lines.

The Contractor shall coordinate with all affected utility owners for work to be performed on said utility as defined in the Contract documents. Coordination shall include application for permits, licensing, payment of fees, scheduling

inspections with each owner, as required. All such costs and/ or time spent for coordination with utility owners shall be paid by the Contractor, and shall not be compensated with a Pay Item or Change Order.

Subsection 105.16 shall include the following:

The Inspector will provide all inspection during construction. The Inspector will oversee the materials testing.

The Contractor shall keep the Inspector informed of future construction operations to facilitate scheduling of required inspection. The Contractor shall notify the Inspector 24 hours in advance of starting any construction operation that will require inspection. Failure of the Contractor to provide such notice shall relieve the Owner from any responsibility for extra costs or delays caused by such failure.

Inspection of the work or materials by the Owner or conversations made between the Contractor and the Inspector shall not relieve the Contractor of the obligation to fulfill the requirements of the Contract. Work and materials not meeting such requirements shall be made good, and unsuitable work or materials may be rejected, notwithstanding that such work or materials have been previously inspected by the Owner or that payment thereof has been included in a progress estimate.

Inspection and acceptance of work pertaining to utilities not owned by the City shall be made by a representative of the owning utility. The Contractor shall obtain required permits and/ or licenses and notify & schedule an inspection by the owning utility prior to commencing any work so that a representative may be made available to approve the work to be performed.

Subsection 105.21 (a) shall include the following:

The one year guarantee period for the portion or unit of the project partially accepted will not begin until completion of the entire project unless otherwise agreed to by the Engineer.

In subsections 105.22 and 105.24 change all references to CDOT to the Renewal Wheat Ridge and remove all references to subsection 105.23.

Subsection 105.22 shall include the following:

The Contractor shall waive, release or extinguish its rights to recover costs or damages, or equitable adjustment, for delays in performing this contract if such delay is caused, in whole or in part, by acts or omissions of Renewal Wheat Ridge or its agents unless Renewal Wheat Ridge accepts responsibility. An extension of time for completion of the work shall be the Contractor's remedy for such delay.

The Contractor shall not be entitled to additional monetary compensation for delays caused by the failure of a utility company or special district to relocate its facilities in timely manner. An extension of time for completion of the work shall be the Contractor's remedy for such delay. Relief from failure of utility companies to fulfill their responsibilities is discussed in subsection 105.11 of the Standard Specifications.

In subsection 105.22 (d) delete the last paragraph and replace with the following:

If these meetings do not result in a resolution or the participants mutually agree that they have reached an impasse, the Contractor may file a claim in accordance with subsection 105.24.

Delete subsection 105.23.

In subsection 105.24 change the reference to City and County of Denver and replace with Jefferson County:

In subsection 105.24 (c) delete the reference and address to CDOT Audit Unit and replace with Renewal Wheat Ridge:

Add subsections 105.25 and 105.26 as follows:

**105.25 Protection of Survey Markers.** Survey markers shall be protected as follows:

- (a) *Permanent Survey Markers.* Should the Contractor believe that a survey monument, control point, or benchmark will be disturbed by construction activities, the Contractor shall notify the Project Engineer not less than seven days prior to starting work in order that the Project Engineer may take necessary measures to insure the preservation of

survey monuments, stakes and bench marks. The Contractor shall notify the Project Engineer and bear the expense of replacing any that may be disturbed without permission. Replacement shall be done by a Registered Land Surveyor at no expense to the Owner.

When a change is made in the finished elevation of the pavement of any roadway in which a permanent survey monument is located, the monument cover or box shall be adjusted to the new grade.

- (b) *Lot Stakes.* Unless otherwise directed by the Project Engineer or shown in the plans, the Contractor shall preserve existing survey stakes that mark property lines and corners. Any stakes that become lost or disturbed by his operations shall be replaced at the Contractor's expense by a registered land surveyor. Any lot corners marked on sidewalks that are designated for removal by the Contract Documents or the Project Engineer are not the responsibility of the Contractor for replacement.

**105.26 Maintenance During Free Time.** Maintenance during free time, shall meet the requirements of Sec. 105.19 and shall be considered incidental to the work.

## **REVISION OF SECTION 106 CONTROL OF MATERIAL**

Section 106 of the CDOT Standard Specifications is hereby revised for this project as follows:

Delete subsection 106.03 and replace with the following:

**106.03 Samples, Test, Cited Specifications.** Materials sampling and testing shall be performed at the expense of the Contractor. The Contractor shall employ an independent materials testing company to sample and test the materials or the finished product in accordance with the City Materials Testing Requirements, and the Frequency Guide Schedule of the CDOT Field Services Manual, per Section 720 of the City Special Provisions. All materials sampling, testing and inspection shall be performed by certified field technicians who work under the supervision of a registered professional engineer in the State of Colorado practicing in this field.

Field technicians shall furnish copies of failed test results to the Project Engineer within two working days of completion and prior to the next phase of construction. On a weekly basis, the Contractor shall furnish the Project Engineer with copies of all test results taken that week and a cover letter, signed by the supervising registered professional engineer, which summarizes the results and addresses any failed tests or inconsistencies.

Unless otherwise designated, all specifications, standards or policies referenced in Section 720 shall be the latest edition as revised or updated by approved supplements published and issued prior to the date of the advertisement for bids.

Subsection 106.08 shall include the following:

The Contractor will not receive compensation for storage of topsoil or other materials generated on site that are stored either on site or offsite for later disposal or inclusion into the Work.

Add subsection 106.14 as follows:

**106.14 Trade Names, Approved Equals, or Substitutes.** In order to establish a basis of quality, certain processes, types of machinery and equipment, or kinds of materials may be specified either by description or process or by designating a manufacturer by name and referring to that brand or product designation, or by specifying a kind of material. It is not the intent of the specifications to exclude other processes, equipment or materials of equal value, utility or merit.

Whenever a process is designated, or a manufacturer's name, brand or item designation is given, or whenever a process or material covered by patent is designated or described, it shall be understood that the words "or approved equal" follow such name, designation, or description, whether in fact they do so or not.

If it is desirable to furnish items of equipment by manufacturers other than those specified, as a substitute after the contract is executed, the Contractor shall secure approval prior to placing a purchase order or furnishing the same.

If the proposal includes a list of equipment, materials, or articles for which the Contractor must name the manufacturer at the time of submission of the bid, no substitutions therefore will be permitted after a proposal has been accepted without the express consent of the Owner.

### **REVISION OF SECTION 107 LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC**

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

Subsection 107.12 shall include the following:

Property pins, right-of-way markers and other survey corners shall remain undisturbed until a method of preserving or perpetuating such markers is approved by Owner. Should any such markers be disturbed, destroyed or removed without obtaining said approval, the Contractor shall be assessed for any costs incurred in resurveying, resetting, and registering said markers.

In subsection 107.15 change all references to CDOT to the Renewal Wheat Ridge.

Subsection 107.15 shall include the following:

Certificates of Insurance shall be attached to the executed Contract Documents and shall become a part of the contract. These certificates shall include a provision that thirty days prior to insurance cancellation, written notice shall be given to Renewal Wheat Ridge.

Indemnification of Owner - Contractor hereby indemnifies and agrees to hold the Owner harmless for and on account of any act or omission in the completion and execution of the project specified herein, which indemnification shall extend to and include any damage of whatever sort or description, suffered by any person or entity, and shall include compensatory, punitive or special damages; and Contractor agrees to defend Owner hereunder, at Contractor's sole expense and if he fails to do so, to thereafter indemnify Owner, in addition to the above indemnification, for all court costs and attorney's fees incurred in any defense required to be undertaken by the Owner.

Add subsection 107.18 as follows:

**107.18 Contractor's Responsibility During Warranty.** The Contractor shall, at his sole expense and cost, remedy any defects in the work, and pay for any damage to other work resulting therefrom, which shall appear within a period of one year from the date of final acceptance of work unless a longer period is specified. The Owner will give notice of defects with reasonable promptness upon their discovery.

In subsection 107.25 change all references to Region Environmental to the City.

### **REVISION OF SECTION 108 PROSECUTION AND PROGRESS**

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

In subsection 108.02 delete the last sentence and replace with the following:

The Contractor shall commence work under the Contract within 14 calendar days of the date of the Notice to Proceed.

Subsection 108.05 shall include the following:

Working hours under this Contract shall be between 7:00 am and 5:00 pm. The Contractor shall not operate equipment before 7:00 am and shall schedule all work operations to be completed before 5:00 pm. Work after 5:00 pm will not be allowed except when required for circumstances beyond the Contractor's control and when approved by the Project Engineer. Work between 5:00 pm and 6:00 pm on more than two consecutive working days will be charged as one-half working day. Work after 6:00 pm on any day will be charged as one-half working day.

Contractor operations in lanes open to traffic are not allowed between the hours of 6:30 am to 8:30 am and 3:30 pm to 6:30 pm, unless otherwise approved by the Engineer. These restrictions apply to temporary delays including ingress and egress of materials, etc.

Subsection 108.08 shall include the following:

An extension of time for completion of the work shall be the Contractor's sole remedy for delays in performing this contract if such delay is caused, in whole or in part, by acts or omissions of Renewal Wheat Ridge or its agents unless Renewal Wheat Ridge accepts responsibility.

An extension of time for completion of the work shall be the Contractor's remedy for delays in performing this contract caused by the failure of a utility company or special district to relocate its facilities in timely manner. Relief from failure of utility companies to fulfill their responsibilities is discussed in subsection 105.11 of the Standard Specifications and the Renewal Wheat Ridge Special Provisions.

Delete subsection 108.09 and replace with the following:

**108.09 Failure to Complete Work on Time.** A daily charge will be made against the Contractor for each working day, including free time, that any Work shall remain uncompleted after elapse of Contract Time. This daily charge, determined by the original Contract amount for the Project from the table below, will be deducted from any money due the Contractor. This deduction will not be considered a penalty but as liquidated damages.

The schedule of liquidated damages set forth below is an amount, agreed to for purposes of this Contract by the Contractor and Renewal Wheat Ridge, as reasonably representing the additional costs incurred by Renewal Wheat Ridge, both for its time, labor and expenses, and for those damages and inconveniences suffered by the residents of the City as a result of delay in completion of the Project.

**Schedule of Liquidated Damages**

Original Amount of Contract		Liquidated Damages per Contract Day
For More Than	Up to & Incl.	
\$ 0	\$ 100,000	\$ 200
\$ 100,000	\$ 500,000	\$ 500
\$ 500,000	\$ 1,000,000	\$ 750
\$ 1,000,000	\$ 2,000,000	\$ 1,000

Due account shall be taken of any adjustments of the Contract Time for completion of the Work granted under the provisions of Subsection 108.07.

Permitting the Contractor to continue and finish the Work or any part thereof after the Contract Time has elapsed shall not be construed as a waiver on the part of Renewal Wheat Ridge of any of its rights under the Contract.

Deductions assessed as liquidated damages under this Section shall not relieve the Contractor from liability for any damages or costs resulting from delays to other Contractors on the Project or other Projects caused by a failure of the assessed Contractor to complete the Work according to Contract Time.

**REVISION OF SECTION 109  
MEASUREMENT AND PAYMENT**

In subsection 109.01 change all references to CDOT to Renewal Wheat Ridge.

In subsection 109.04 (c) 1. delete the formulas for Hourly Rate and Standby Rate (RR and SR respectively). Payment will be made on a flat rate for hourly and standby rental rates plus EOC.

Delete subsection 109.04 (f) and replace with the following:

- (f) The Contractor's representative and the Inspector shall, on a daily basis, agree in writing on the quantities of labor, equipment and materials used for work, extra work, and/ or force account work.

Subsection 109.04 (h) shall include the following:

Time extension for force account work shall be allowed only if a controlling operation or critical path item of the project is interrupted. Time extension requests shall meet the requirements of subsection 108.08. Force account items shall be completed in a workmanlike manner so as not to cause undue delays.

In subsection 109.06 (a) delete the second sentence and replace with the following:

The amount to be retained will be 10 percent of the value of the completed work to a maximum of 5% of the total contract amount including change orders and contingency.

Subsection 109.06 (a) shall include the following:

At the time of the Preconstruction meeting, the Contractor shall submit to Renewal Wheat Ridge a schedule of partial progress payments. This schedule will show the percentage of Work completed and the date and dollar amount of each anticipated progress payment.

Renewal Wheat Ridge will pay any monies due the Contractor within 30 days of approval of a Request for Partial Payment.

Delete subsection 109.06 (b) and replace with the following:

(b) Securities are not acceptable to Renewal Wheat Ridge in lieu of standard amount retained.

Add subsection 109.08 as follows:

**109.08 Final Guarantee.** All work shall be and is guaranteed by the Contractor for a specified period of one year from and after the date of written final acceptance of all work by Renewal Wheat Ridge, unless a longer period is specified. All other current applicable State statutes shall apply.

If within the guarantee period, non-emergency repairs, changes, or replacements are required in connection with guaranteed work which, as determined by Renewal Wheat Ridge, is rendered necessary as the result of the use of materials, equipment or workmanship which are inferior, defective or not in accordance with the terms of the contract, the Contractor shall, within 14 calendar days from receipt of notice from Renewal Wheat Ridge, and without expense to Renewal Wheat Ridge:

- (a) place in satisfactory condition, in every particular, all of such guaranteed work, correct all defects therein, or proceed with replacement of defective or unsatisfactory work where deemed necessary by the Project Engineer; and
- (b) make good all damage to the building site, equipment or contents thereof which, in the opinion of the Project Engineer, is the result of the use of materials, equipment or workmanship which are inferior, defective, or not in accordance with
- (c) the terms of the contract; and make good any work or material disturbed, or the equipment and contents of any building or structure on the site, in fulfilling any such guarantee.

In the case of emergency repairs, changes or replacements, the Contractor shall promptly upon receipt of Notice from Renewal Wheat Ridge and without expense to Renewal Wheat Ridge, perform the necessary actions to remediate the situation.

## **REVISION OF SECTION 202 REMOVAL OF STRUCTURES AND OBSTRUCTIONS**

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

Subsection 202.02 shall include the following:

Areas within existing asphalt pavement that are designated for removal or patching shall be sawcut to the full depth of the asphalt or cut by a method approved by the Engineer which leaves a vertical face on the existing pavement and no deformation of the surface at the cut. Limits of cutting for patching shall be as directed by the Engineer. Asphalt sawing

or other approved cutting methods shall be incidental to the pay items for HBP (Patching), Removal of Asphalt, or pay items which include removal of asphalt pavement.

All street cuts shall be in straight lines. Irregular shaped cuts with more than four (4) sides or cuts within existing patches shall not be allowed. Street cuts shall have no longitudinal joints within the wheel tracks.

Trees with a specified trunk diameter measured one foot above the ground surface and shrubs that are designated for removal under this section shall be removed in accordance with the requirements of Section 201. Removal of remaining vegetation as required by the project will be paid under Section 201.

Irrigation lines to be abandoned shall be adequately capped at the point of abandonment to prevent leaks or blowouts of the line that is to remain. The irrigation lines that are to be abandoned can remain in place unless removal is necessary to allow other work.

Subsection 202.03 shall include the following:

All inlet castings, manhole rings and covers and other metal items relating to structures to be removed shall remain the property of the City or the owning utility company. This material shall be reused on the project where possible or as directed by the Engineer. Material not reused on the project shall be delivered to the City or owning utility company unless arrangements have been made for it to be picked up by the City or owning utility company.

Subsection 202.07 shall include the following:

Concrete from curbs, gutters, sidewalks and pavements may not be used in fills unless crushed to meet the gradation requirements for Class 4 Aggregate Base Course.

Subsection 202.09 shall include the following:

Planers shall operate moving against traffic in areas being planed in order to ensure that trucks used in hauling removed materials will be able to arrive and depart with the flow of traffic.

Planing shall result in a surface acceptable to the Engineer. Acceptability shall be based upon the following criteria:

1. Free of surface ridges in excess of ¼ inch.
2. Planed surface parallel to lane lines.
3. Surface area free of excess surface fines.
4. All planed surfaces, especially wheel ruts, show scoring by planer teeth.
5. Specified cut depth attained at edges of roadway appurtenances and curb lips.

Vertical cuts adjacent to traffic lanes from rotomilling over 1" depth shall be delineated at 50 foot intervals immediately after removal operations.

The Contractor shall use caution when planing around manholes, water valve boxes and other roadway appurtenances. Manholes, water valve boxes and other similar structures shall either be adjusted to below the bottom of the cut prior to commencing planing operations or cut around using planing equipment. The maximum deviation between the top of the milled pavement and top of the manhole or water valve box shall be no more than ¾ inch in areas open to traffic. This condition may be achieved by placing a temporary wedge of HBP around the structure. This temporary taper shall be removed prior to placement of paving fabric and new HBP.

Subsection 202.11 shall include the following:

Removal of trees will be measured by the actual number of trees removed with specified diameters measured 4.5 feet above the ground surface. Multiple tree trunks from one root structure with one trunk being the specified diameter will be considered one tree. Trees with a diameter less than 4" or when removal of trees is not included as a separate pay item, removal of trees shall be included in clearing and grubbing.

Removal of existing asphalt pavement for patching, to include asphalt sawing or other approved methods of cutting existing asphalt pavement, will not be measured but shall be incidental to the pay item for HBP (Patching).

Abandon irrigation line will be measured by the actual number of point of connections that require capping.

Subsection 202.12 shall include the following:

<u>Pay Item</u>	<u>Pay Unit</u>
Removal of Tree (< 12")	Each
Removal of Tree (> 12")	Each
Abandon Irrigation Lines	Each

**REVISION OF SECTION 208  
EROSION CONTROL**

Section 208 of the CDOT Standard Specifications is hereby revised for this project as follows:

In subsection 208.03 change the following references:

All references to CDOT to City

All references to The Region Water Pollution Control Manager to City Stormwater Coordinator

Add subsection 208.03 (f) as follows:

(f) Stormwater Management Plan & CDPHE Permit

1. Unless notified in writing to the contrary, the Contractor shall prepare SWMP immediately following City Council Approval of the Project. Renewal Wheat Ridge shall provide the Contractor with a Notice of Intent, authorizing the Contractor to begin work on the SWMP while the Project contract documents are being signed. This expedited process is designed to minimize delays to the Project from SWMP preparation and permitting with the Colorado Department of Public Health and Environment (CDPHE).
2. The SWMP is required for all projects regardless of whether or not an "Erosion and Sediment Control Plan" is shown in the plans. If provided, the "Erosion and Sediment Control Plan" may be made part of (and modified by) the SWMP document. The City shall provide examples of a City approved SWMP document upon request.
3. When necessary, immediately following written approval of the SWMP, the Contractor shall make application to the CDPHE for a "General Permit Application for Stormwater Discharges Associated with Construction Activity". The Contractor shall prepare all application materials and pay the application fee. Typically, the CDPHE issues a stormwater permit within 10 days of application. No land disturbance work may proceed until a Stormwater permit has been received by the Contractor, and a copy of same has been provided to the City.

Subsection 208.04 (f) shall include the following:

Any sediment or debris which may have accumulated as a result of construction in any waterway, swale, stormwater detention area, inlet structure, curb, pipe or any other system of conveyance of water shall be promptly removed by the Contractor to the satisfaction of the Engineer. This includes routine cleaning and maintenance of any BMP that prevents construction sediment from entering a City stormwater collection system or directly into a waterway.

Add subsection 208.05 (t)

(t) Street Sweeping

The Contractor shall make every effort to ensure that sediment and construction debris does not leave the construction site and be deposited on surrounding streets. Recognizing that complete prevention of migrating soil and rock material is impossible, Renewal Wheat Ridge has provided a reasonable allowance for Street Sweeping mobilizations. Each Street Sweeping unit shall consist of one mobilization and a minimum of 2 hours of Street Sweeping with a mechanized wet sweeping device designed to minimize dust while removing all evidence of construction activity from all surrounding streets. The time during each mobilization may be extended by request of Renewal Wheat Ridge, to ensure that all construction debris is removed from existing streets, at no additional cost or pay item charge to Renewal Wheat Ridge.

Should Renewal Wheat Ridge determine that additional Street Sweeping mobilizations are required during the course of the Project to remove construction debris from the project site or surrounding streets, Renewal Wheat Ridge shall notify the Contractor, and the Contractor shall provide these at no additional cost to Renewal Wheat Ridge.

All evidence of Construction debris on surrounding streets extending less than 50 feet beyond the Limits of Construction shall be promptly removed by the Contractor by sweeping at the end of each working day, at no additional cost to Renewal Wheat Ridge. Significant evidence of Construction debris extending beyond fifty (50) feet from the Limits of Construction shall be removed by the Contractor at the end of each work week, or the last working day before a weekend or holiday, whichever comes sooner. To perform this removal, the Contractor may utilize a Street Sweeping pay item, or remove the debris via conventional sweeping (in a manner to control dust), at no additional cost to Renewal Wheat Ridge. Once the Contractor has exhausted his Street Sweeping pay item quantity, the Contractor shall regularly remove (per the requirements of this Section) Construction debris via Street Sweeping or other sweeping method designed to minimize dust (pressure washing or use of only water for purposes of cleaning is not acceptable) to the end of Construction Activity at no additional cost to Renewal Wheat Ridge.

### **REVISION OF SECTION 210 RESET STRUCTURES**

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

Subsection 210.02 shall include the following:

Any work performed by the Contractor on a utility facility is subject to inspection and approval by the owning utility company. The Contractor is responsible for coordinating inspection with the owning utility.

The contractor must give written notice to all customers affected by water service outages at least 24 hours before the water is turned off for this work. The Contractor shall give a minimum of 24 hours notice to the owning utility company before any work which will affect their facilities. The Contractor shall not operate any water valves without permission of the owning utility company.

Subsection 210.10 shall include the following:

Any existing manholes, water valves, range boxes, traffic control boxes, etc., which are required to be adjusted shall be adjusted to 1/4 inch below finished grade prior to or immediately following placement of the final lift of asphalt. The intent of this specification is that the freshly placed HMA be compacted around the structure after the structure is adjusted to finish grade. When adjusting valve boxes, the box shall be cleaned of all foreign debris such that the operating nut of the valve is fully accessible to operate. The work shall be subject to inspection by and approval of the owning utility and is incidental to the pay item for adjusting water valves.

Subsection 210.12 shall include the following:

The pay item for resetting, modifying or adjusting meter pits shall include all additional material required to modify, adjust and/or reset the meter pits and curb stops.

Tapping tee, valves, pipe, pipe fittings and other materials required to reset, relocate or extend a fire hydrant assembly will be included in the pay item for Reset Fire Hydrant.

Subsection 210.13 shall include the following:

Pay items shall include, unless otherwise specified, all new hardware and material.

Add subsections 210.14 – 210.16 as follows:

**210.14 Fire Hydrants.** If required on the drawings, before resetting, relocating or extending fire hydrants, the Contractor shall contact the owning utility for inspection of the removed hydrant. The Contractor may be required to excavate the existing tee and remove any pipe or valves at the tee and place a plug at the tee if required by the owning utility company. The new hydrant lead is to be constructed of all new pipe and other material.

**210.15 Water or Sewer Service Line.** This work shall be performed where necessary to remove, relocate, or replace a utility service line caused by a grade and/or line conflict with new construction. Adjustment work may entail complete relocation and replacement of the affected service line. Payment under this item shall include all costs associated with

service line relocation. For reset work, the approximate limits of replacement would be the width of the trench. Payment under this item shall include all costs associated with service line restoration within the limits of the excavation.

**210.16 Water Meter Pit.** Adjustment work shall be performed on existing water meter pits. The Contractor will adjust existing water meter pit structures to grade. Adjustment of associated curb stops shall be included under this pay item. For reset work, the contractor shall remove the existing water meter pit and replace the existing structure with new meter pit structure material. Unless otherwise specified, required material will be supplied by the **CONTRACTOR**. The new meter pit will be relocated along the existing water lateral. This pay item also includes all work and additional material required to complete installation of the new meter pit structure to finish grade. Resetting the curb stop shall be included under this pay item. Modification work shall entail the conversion of the existing water meter pit cover to a heavy duty lid and frame adjusted to grade. This pay item shall also include related work on the associated curb stop. Unless otherwise specified, the heavy duty frame and lid will be furnished by the Contractor.

**REVISION OF SECTION 306  
RECONDITIONING**

Section 306 of the CDOT Standard Specifications is hereby revised for this project as follows:

Subsection 306.01 shall include the following:

This work also consists of proof rolling the subgrade.

Subsection 306.02 shall include the following:

All proof rolling shall also be performed per the requirements of Section 203.

Delete subsection 306.03 and replace with the following:

**306.03** Reconditioning and Proof rolling will be measured by the square yard of subgrade and shall include scarifying, compacting, moisture control, finishing, proof rolling, and maintaining the finished surface.

Delete subsection 306.04 and replace with the following:

**306.04** The accepted quantities of reconditioning and proof rolling will be paid for at the contract unit price for reconditioning and proof rolling.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
Reconditioning and Proof rolling	Square Yard

Water will not be measured and paid for separately but shall be included in the work.

**REVISION OF SECTION 401  
PLANT MIX PAVEMENTS-GENERAL**

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

Subsection 401.02 shall include the following:

Reclaimed Asphalt Pavement (RAP) is allowed in hot mix asphalt (HMA) up to a maximum of 25 percent provided all specifications for HMA are met. Fine Aggregate Angularity requirements shall apply only to the virgin fraction of the fine aggregate. The RAP shall not contain clay balls, vegetable matter, or other deleterious substances. Mixtures with more than 20 percent RAP shall not be used in the top lift of any asphalt pavement.

HMA Project Verification Testing for asphalt content and gradation will be performed at the frequencies listed in the Field Materials Manual in accordance with CP-L 5120.

The Contractor shall have an approved mix design for the amount of RAP to be used. The AC content of the RAP utilized in the Contractor RAP mix design shall be the average AC content determined in accordance with 1B or 1C

below, or alternatively, a minimum of five samples of the Contractors RAP stockpile may be sampled and the average AC content of the RAP be determined using AASHTO T-164, Method A or B, or in accordance with 1C below.

The use of RAP shall be controlled in accordance with subsections 105.05 and 106.05. If the Contractor elects to use RAP, the following additional conditions shall apply:

(1) The Contractor shall have an approved Quality Control (QC) Plan that details how the RAP will be processed and controlled. The QC plan shall address the following:

- A. RAP Processing Techniques. This requires a schematic diagram and narrative that explains the processing (crushing, screening, and rejecting) and stockpile operation for this specific project.
- B. Control of RAP Asphalt Binder Content (AASHTO T-164, Method A or B). RAP Asphalt Binder Content may also be determined in accordance with CP-L 5120, provided a RAP AC content correction factor is determined through correlation testing with AASHTO T-164, Method A or B. The correction factor shall be determined by performing correlation testing on the first five samples of the RAP AC content, then at a frequency of one for every five AC content tests thereafter. The correction factor shall be determined by calculating the average difference in AC content between CP-L 5120 and AASHTO T-164, Method A or B, and applying the correction to the AC content determined in accordance with CP-L 5120:

Frequency: 1/1000 tons of processed RAP material (minimum five tests)

- C. (Alternate) The Contractor may propose a RAP asphalt content correction factor to be used in conjunction with CP-L 5120. The proposed CP-L 5120 RAP asphalt content correction factor shall be used with all RAP asphalt contents tested for the mixture design and quality control sampling and testing. The methodology of the proposed CP-L 5120 RAP asphalt content correction factor shall be outlined in detail in the approved RAP QC Plan. At a minimum, the proposed CP-L 5120 correction factor shall identify the principal source locations of the RAP aggregate, gradation of the material tested, and specific ignition oven serial number used in all the RAP asphalt content testing. The RAP source locations, material gradation, and specific equipment used shall substantiate the CP-L 5120 asphalt content correction factor used for the testing. The substantiation must be from data gathered from historical information or specific asphalt content correction data obtained from tests performed on similar virgin aggregate sources, virgin material gradations, and the specific equipment used.

- D. Control of RAP Gradation (CP31 or AASHTO T-30):

Frequency: 1/1000 tons of processed RAP material (minimum three tests)

- E. Process Control Charts shall be maintained for binder content and each screen listed in subsection 401.02(b), during addition of any RAP material to the stockpile. The Contractor shall maintain separate control charts for each RAP stockpile. The control charts shall be displayed and shall be made available to the Engineer upon request.

(2) The processed RAP must be 100 percent passing the 31.5 mm (1¼ inch) sieve. The aggregate obtained from the processed RAP shall be 100 percent passing the 25.0 mm (1 inch) sieve. The aggregate and binder obtained from the processed RAP shall be uniform in all the measured parameters in accordance with the following:

**UNIFORMITY\***

Parameter	Standard Deviation
Binder Content	0.5
Percent Passing 19 mm (¾")	4.0
Percent Passing 12.5 mm (½")	4.0
Percent Passing 9.5 mm (¾")	4.0
Percent Passing 4.75 mm (#4)	4.0
Percent Passing 2.36 mm (#8)	4.0
Percent Passing 600 µm (#30)	3.0
Percent Passing 75 µm (#200)	1.5
*Uniformity is the Maximum allowable Standard Deviation of test results of processed RAP.	

(3) The Contractor shall supply a Performance Graded Binder which meets the AASHTO MP-1 specifications for one temperature grade lower for both the high and low end than that specified in the Contract if RAP content is greater

than 15 percent. For example, if the Contract originally specified a PG 76-28, the Contractor shall supply a binder meeting the AASHTO MP-1 specifications for a PG 70-34.

Subsection 401.02 (a) shall include the following:

The contractor shall submit a hot mix design for each mixture required by the contract a minimum of fourteen (14) days prior to beginning construction.

Mix designs shall be performed in a materials laboratory under the direct supervision of, and shall be stamped and signed by a Professional Engineer licensed in Colorado. **The design submittal shall include the following information:**

- (1) Source of materials, including aggregate, asphalt cement and anti-stripping additive.
- (2) Gradation, specific gravity, description of individual aggregates and final aggregate blends.
- (3) Aggregate physical properties.
- (4) Design Job Mix Formula.
- (5) Asphalt Cement properties.
- (6) Mixing and compaction temperatures.
- (7) Mixture properties determined at a minimum of four asphalt contents with graphs showing mixture properties versus asphalt content.
- (8) Properties at the optimum asphalt cement content.
- (9) Verification tests performed during mix production.

\* The optimum percent AC content shall be chosen at 4.0 percent air voids in accordance SP-2.

Mix designs shall be based upon the following traffic loading criteria, unless otherwise specified on the drawings:

Traffic Level (MGPEC designation)	I	II
EDLA (Equiv. Daily 18 kip Loaded Axle)	0-40	40-410
Street Classification (City designations)	Local	Collector
Asphalt Cement	PG 64-22	PG 64-22

The hot mix asphalt shall be designed in accordance with Colorado Procedure CP-L 5115, "Standard Method for Preparing and Determining the Density of Bituminous Test Specimens by Means of the Gyrotory Compactor" for the Superpave Method of Mixture Design.

Additional guidance is provided in "Superpave Level 1 Mix Design" SP-2 published by the Asphalt Institute. Mix designs shall meet the criteria outlined for the applicable method used. Grading SG mixes shall be designed using appropriate 150mm molds for the Superpave method.

Subsection 401.02 (b) shall include the following:

The design job mix formula (JMF) for each mixture shall establish a single percentage of bituminous material to be added to the aggregate, and a single temperature for the mixture at the plant discharge point. The City may test the Contractors proposed JMF for each hot bituminous pavement grading utilizing materials actually produced and stockpiled for use. Contractor shall provide a sufficient quantity of each aggregate, mineral filler, RAP and additive for the required laboratory tests if requested by the City.

After the JMF is approved, a new JMF shall be submitted to the Project Engineer if there is a change in the source of materials.

Subsection 401.06 shall include the following:

Asphalt cement grade PG 64-22 shall be required unless otherwise specified on the drawings.

Delete subsection 401.07 and replace with the following:

Hot mix asphalt shall be placed only on properly prepared unfrozen surfaces that are free of water, snow or ice. The hot mix asphalt shall be placed in accordance with the temperature limitations of table 401-3 and only when weather conditions permit the pavement to be properly placed and finished, as approved by the Project Engineer.

**Table 401-3  
Placement Temperature Limitations**

<b>Compacted Layer Thickness (Inches)</b>	<b>Minimum Air and Surface Temperature (Degrees F)</b>	
	<b>Top Pavement Layer</b>	<b>Layers Below Top Layer</b>
< 1	60	50
1 to 3	50	40
> 3	NA	30
Air temperature is taken in the shade. Surface is defined as the existing base on which the new pavement is to be placed.		

No top pavement layer shall be greater than 3 inches.

Minimum temperature requirements may be waived by the Project Engineer if it is in the best interest of the City. However, paving operations will be suspended when density requirements are not met.

Delete subsection 401.11 and replace with the following:

Prior to patching or placing hot mix asphalt, the exposed sides of bituminous pavement, concrete pavement, concrete structures and concrete curb and gutter to make contact with placed hot mix asphalt shall be thoroughly coated with emulsified asphalt.

Except within the limits of geotextile placement, a tack coat shall be provided for pavement overlay work.

Unless approved by the Project Engineer, subsequent hot mix asphalt lifts shall not be placed in the same day. A tack coat shall be provided between lifts when they are not placed in the same day.

Grade CSS-1h or SS-1h emulsified asphalt shall be thinned with an equal amount of clean water and the mixture applied at the rate of 0.15 gallons per square yard.

In subsection 401.12 change the second paragraph as follows:

Prior to placing tack coat for hot mix asphalt the surface shall be swept with a pick-up type sweeper. Power broom type sweeper shall not be allowed.

Subsection 401.15 shall include the following:

Hot mix asphalt shall be mixed at temperatures recommended by the asphalt cement supplier for the type and grade of asphalt cement used. The material shall be delivered to the project at temperatures adequate to allow compaction in accordance with the asphalt cement supplier's recommended compaction temperature range.

Hydrated lime shall be added to the aggregate in accordance with one of the following methods:

- (1) Lime Slurry Added to Aggregate. The hydrated lime shall be added to the aggregate in the form of a slurry and then thoroughly mixed in an approved pugmill. The slurry shall contain a minimum of 70 percent water by weight.
- (2) Dry Lime Added to Aggregate. The dry hydrated lime shall be added to wet aggregate (a minimum of three percent above saturated surface dry) and then thoroughly mixed in an approved pugmill.

Subsection 401.19 shall include the following:

If one or more samples of hot mix asphalt (HMA) fail to meet criteria requirements, the Contractor, at his expense, shall cut a minimum of 4 additional cores in the area represented by the failing sample. Renewal Wheat Ridge will take possession of the cores and will have the necessary tests performed on each of the sample locations. Duplicate cores may be taken and retained by the Contractor at the Contractor's expense. The time which the core samples are taken, the number of cores and their location shall be established by Renewal Wheat Ridge. Taking cores and patching the core holes will be performed by the Contractor at his sole expense. The Contractor shall reimburse Renewal Wheat Ridge for all expenses related to inspecting, coring, testing and determining specified limits that the MHA failed to meet.

### **REVISION OF SECTION 403 HOT MIX ASPHALT**

In subsection 403.01 the last paragraph shall include the following:

This work consists of constructing one or more courses of bituminous pavement on a prepared base in accordance with these specifications, and in conformity with the lines, grades, thicknesses, and typical cross sections shown on the plans or established.

Subsection 403.03 shall include the following:

Areas to be patched back shall be saw cut, unless alternative methods of cutting which produce straight lines and vertical cuts are approved by the Project Engineer. Limits of cutting shall be as specified on the plans or as directed by the Engineer. Jagged edges are unacceptable and shall be replaced at the Contractors expense. Prior to placement of the patch, all exposed sides of the existing pavement shall be thoroughly coated with tack.

All materials excavated from the patch area shall become the property of the Contractor and hauled from the site.

### **REVISION OF SECTION 608 SIDEWALKS AND BIKEWAYS**

Subsection 608.01 shall also include the following:

This work also consists of the construction of sidewalk chases, raised crosswalks, and patterned concrete in accordance with the Contract Documents. This work includes the installation of detectable warnings on concrete curb ramps at the locations shown in the plans and in accordance with the plans.

Subsection 608.02 shall include the following:

Frame for sidewalk chase shall meet the requirements of ASTM A36 for Carbon Steel, or ASTM B209, B211, B221, or B241 for Aluminum Alloy 6061-T6 or 6063-T6. Top shall be hot dipped galvanized steel.

Pattern concrete shall be Class B, full depth Davis Color "Brick Red", imprinted "Windsor Cobble" pattern by Brickform (or approved equal). Imprinting forms shall be released with Brickform RA-600 Light Gray Antique Release Agent (or approved equal) in accordance with the Brickform Antique Release Agent Technical Information sheet. All antiqued surfaces shall be broom cleaned, pressure washed, and sealed with 2 coats of Brickform Masterseal Sealer (or approved equal), after a curing period of 28 days. Use and application of all products shall be per manufacturer:

Brickform by Rafco Products  
11061 Jersey Blvd  
Rancho Cucamonga, CA 91730  
800-483-9628  
www.brickform.com

Surface applied and cast in place detectable warnings tiles for the ramps shall be red in color and comply with all Americans with Disabilities Act (ADA) requirements. The detectable warnings nominal tile size shall be determined by the location. In general, the minimum size shall be 24" x 36" surface applied for retrofits and 24" x 60" cast in place for new construction. At locations where a ramp is being constructed or reconstructed and a 24" x 60" tile cannot be installed then a 24" x 36" cast in place shall be allowed. Renewal Wheat Ridge has the sole determination as to where and what size tile shall be placed.

The detectable warning tiles shall be constructed per CDOT Standard Plan M-608-1 specifications. The tiles shall be manufactured by Armor-Tile® or a City approved equal, "Brick Red" in color. Unless otherwise stated, all manufactures' recommendations and specifications shall be strictly adhered to.

In subsection 608.03 (b) delete the last sentence.

Subsection 608.03 (f) shall include the following:

Only clear VOC compliant curing compound shall be used to cure colored concrete. Only white VOC compliant curing compound shall be used to cure grey concrete.

Add subsections 608.03 (g) and (h) as follows:

- (g) *Structures.* Meter pits and manholes shall be installed or adjusted such that the frame and cover rest flush with the sidewalk. Cover shall not move within the frame and shall be reinforced as necessary to prevent deflection under light vehicle wheel loads (pickup truck).
- (h) *Cleanup of residual colored concrete or Release Agent.* Release Agent powder or residual colored concrete shall be removed from job site in a manner to avoid the material being washed offsite or into curb flowlines and the City storm drainage system. All materials collected shall be disposed of properly. All residual colored concrete or release agent powder shall be removed from the work area by sweeping & dustpan, vacuuming, and/ or power washing & containment methods. Following the application of patterned concrete, should evidence exist that residual colored concrete or release agent powder has been transported to adjacent curb flowlines or into the City storm drainage system, the Contractor shall clean all affected facilities to the satisfaction of the Engineer. Through actions of the Contractor, should any deleterious construction material reach the City storm drainage system and discharge into local waterways, the Contractor shall perform necessary environmental cleanup per the satisfaction of the Engineer, and the State of Colorado Department of Public Health and Environment.

Delete subsection 608.05 and replace with the following:

**608.05.** Concrete curb ramps will be measured by the unit. The colored concrete portion (if any) of concrete curb ramps and raised crosswalks will not be measured for payment but shall be included in the price for ramps and crosswalks.

Pattern concrete will be measured by the square yard of finished surface complete in place and accepted.

Sidewalk chase will be measured by each chase installed.

Subsection 608.06 shall also include the following:

<u>Pay Item</u>	<u>Pay Unit</u>
Concrete Curb Ramp (Type ___)	Each
Pattern Concrete (___" thick)	Square Yard
Raised Crosswalk	Linear Feet
Sidewalk Chase	Each

Add subsection 608.07 as follows:

**608.07 Pattern Concrete.** The following specifications are intended to be general specifications. The actual construction work shall be performed in accordance with the appropriate manufacturer's recommendations as modified by these specifications. The Contractor shall:

- (a) Provide product data and installation instructions for imprinting tools, release agent, sealing agent, and joint sealants to the Engineer at the Preconstruction Conference.
- (b) Perform all pattern concrete work per manufacturer specifications and supply a foreman or supervisor who has completed at least three previous pattern concrete installations.

- (c) Supply a finished jobsite sample of at least 4' by 4' of the pattern and coloring specified for approval by the Engineer prior to start of construction. The sample may, if approved by the Project Engineer, be incorporated into the work.
- (d) Concrete shall be wooden float finished prior to applications of coloring agents and pattern imprinting.

The subgrade in areas to receive pattern concrete shall be prepared in the same manner as sidewalk. Concrete shall be placed in the same manner as sidewalk concrete and shall be a minimum of 4 inches thick prior to application of the patterning devices.

### **REVISION OF SECTION 609 CURB AND GUTTER**

Section 609 of the CDOT Standard Specifications is hereby revised for this project as follows:

Subsection 609.03 (b) shall include the following:

All curb, gutter faces shall be formed. The terminal ends of all work shall be formed to maintain a true vertical edge. Forms shall be straight, true and in good condition. The Project Engineer reserves the right to order forms which he deems unsatisfactory removed from use in the Work. In the event curb and gutter are to be contiguous but not monolithic, and the sidewalk slopes to the curb head, the top of the curb head shall be finished to slope to the street side of the curb.

Subsection 609.03 (d) shall include the following:

All upper edges of each section shall be tooled. Sidewalk joints shall line up with curb and gutter joints when contiguous. Tooled contraction joints shall be placed where form joint templates are placed. In the event the tooled joint and the form joint template do not coincide and a random crack appears outside the tooled joint, the Contractor will be required to remove the improperly cracked joint. Removal limits will be 1/3 the distance to the next joint on either side of the unsatisfactory joint. In the event contiguous joints are unsatisfactory, the entire stone between the joints will be removed to the outside of the unsatisfactory joint. Concrete sawing will be required to provide a clean joint.

Subsection 609.03 (e) shall include the following:

Expansion material or approved bond breaker material shall be installed between curb and gutter type 2 and abutting sidewalk for the full depth and length if the pour is not monolithic.

### **REVISION OF SECTION 613 LIGHTING**

Section 613 of the CDOT Standard Specifications is hereby revised for this project as follows:

In subsection 613.02 delete the first paragraph and replace with the following:

Street lighting materials shall conform to Section 715, and shall be compatible with the requirements of the local electrical utility company.

Subsection 613.03 shall include the following:

All equipment which is removed shall remain the property of the City. Such property shall be removed from the work site and returned by the Contractor to the Wheat Ridge Maintenance Facility, 11220 West 45th Place. Work relating to the salvage and delivery of salvage material to the City of Wheat Ridge Maintenance Facility will be incidental to the Project.

Excavations, other than for conduit, shall be backfilled with Structure Backfill (Class 1). The surface of the backfill material will be placed to the bottom of the pavement repair or to 6 inches below surface in unpaved areas. The final layer of material will be identical to the material surrounding the backfilled section.

When excavations must remain open overnight, they shall be properly marked to warn motorists and/or pedestrians according to the most recent revision of Part VI in the "Manual on Uniform Traffic Control Devices for Streets and Highways".

Subsection 613.04 shall include the following:

The exposed portions shall be formed with "Sonotube" to present a neat appearance. Sonotube forms shall not extend below finished grade more than 1 foot.

Anchor bolts shall conform to the specifications of the manufacturer of the poles and mast arms and each individual bolt shall have 2 flat washers, 1 lock washer and 2 nuts. Threaded portions of the anchor bolts shall be protected from contamination with concrete or other damage.

In subsection 613.05 delete the title and first paragraph and replace with the following:

**Light Standards.** Poles shall be set plumb on the light foundation using non-corrosive metal shims.

In subsection 613.07 delete the fifteenth paragraph and replace with the following:

Trench excavations for conduit shall be 2 inches wider than the outside diameter of the conduit. Backfilling of conduit trenches shall be accomplished by placing Structure Backfill (flowfill) up to the bottom surface of the roadway pavement material. The remaining portion of the excavation shall be backfilled with the same type of material used to construct the existing roadway surface. Care shall be taken during placement of multiple conduit runs in one trench to ensure Structure Backfill (flowfill) completely surrounds the conduit.

Subsection 613.07 shall include the following:

The ends of all conduits in structures or terminating at curbs shall be marked by a "Y" at least 3 inches high, cut into the face of the curb, gutter or wall directly above the conduit.

Conduit bends, except factory bends, shall have a radius of not less than 6 times the inside diameter of the conduit. Where factory bends are not used, conduit shall be bent without crimping or flattening, using the longest radius practical.

All conduit runs that exceed 10 feet in length shall have a continuous 1/4 inch diameter nylon line pulled into the conduit along with the specified electrical cables. The line shall be firmly secured at each end of the conduit run with a minimum slack of 3 feet. The purpose of this line is to be able to pull future electrical cable through the existing conduit runs.

Pull boxes installed in finished areas shall be designed for such installations and shall be stackable and manufactured of a pre-cast polymer concrete material such as Quazite or an approved equal. The bottoms of all pull boxes shall be bedded in six (6) inches of crushed rock.

When a new conduit run enters an existing pull box, the Contractor shall remove the pull box or tunnel under the side at no less than 18 inches and enter from the direction of the run. No new conduit will be allowed to enter a new or existing pull box in any other manner than that shown on the standard drawings.

New pull boxes will not be paid for separately, but shall be included in the cost of conduit.

Subsection 613.08 shall include the following:

The contractor shall notify the Project Engineer 2 weeks prior to turn-on so that orders may be issued to Xcel Energy for power connection on the specified turn-on date.

In no case shall any shellac compounds be used. All connections shall be wire nut connectors. Connections shall be DIAPERED and sealed with non-conducting silicone at all splices. Splices in underground systems shall be waterproofed. A minimum of 12 inches of slack shall be left at each splice except within handholes where 24 inches shall be left.

In subsection 613.11 delete the first and second paragraphs and replace with the following:

Concrete foundation pads and light standard foundations will be measured by the actual number installed and accepted.

Light standards will be measured by the number of light standards installed.

**REVISION OF SECTION 614  
TRAFFIC CONTROL DEVICES**

Section 614 of the CDOT Standard Specifications is hereby revised for this project as follows:

Delete subsections 614.08 (b) – (c) and replace with the following:

- (b) *Traffic Signal Controller.* The traffic signal cabinet shall be an Econolite ASC/3. No equal or equivalent will be considered.
- (c) *Controller Cabinets.* The traffic signal cabinet shall be an Econolite TS2 T1 PNG CAB ASSY (system ready) with a slide out tray. No equal or equivalent will be considered

- 1. *Cabinet Shell.* The cabinet shell shall meet or exceed the requirements of NEMA 3R rating with the following additions:

The cabinet shell shall be 0.125 inch thick aluminum Type 5052-H32. External welds shall be made using heliarc welding method, whereas internal welds shall be made by the wire or heliarc method. All welds shall be neatly formed and free of cracks, blow holes and other irregularities. All inside and outside edges of the cabinet shall be free of burrs. The exterior surface shall be polished graffiti free aluminum.

The cabinet shall be designed with a sloped top to prevent the accumulation of water on its top surface.

The door opening shall be double flanged on all four sides. A door restraint shall be provided to prevent door movement in windy conditions. The cabinet door shall be a minimum of 80% of the front surface of the cabinet and hinged on the right side when facing the cabinet. The hinges shall be continuous and bolted to the cabinet door using 1/4-20 stainless steel carriage bolts and ny-lock nuts. The hinges shall have a 0.120 inch diameter stainless steel hinge pin capped top and bottom to render it tamper proof. The door latching mechanism shall be a 3-point draw roller type with push rods of 0.250 inch by 0.750 inch steel, minimum. Rollers shall have a minimum diameter of 0.875 inch and be made of nylon with a 0.140 inch steel center. An outside door opening handle will be furnished and shall be stainless steel with a 3/4 inch diameter shank. The latching handle shall have a provision for locking in the closed position. The cabinet shall be provided with louvered vents on the main door. The inside of the main door shall have a washable metal mesh air filter held firmly in place by bottom and top brackets and a spring loaded upper clamp.

The inside of the main door shall be provided with a brace at least 15 inches long, 6 inches high and 1/2 inch deep. A print envelope of at least 15 inches by 12 inches and 10 mil thickness shall be mounted to this brace, with washers to prevent ripping.

A switch (police door) compartment with removable back panel shall be supplied on the outside of the cabinet main door.

The switch compartment and main door shall be furnished with a gasket that satisfies the physical properties as found in UL508 Table 21.1 and will form a weather tight seal between cabinet and door.

The switch compartment door lock shall be Corben R357SGS series or equal and have a key hole cover. The main door shall have a Corben #1548-1 or equal lock with cover. Two keys of each type shall be supplied with each cabinet.

Exhaust air will be vented out between the top of the cabinet and door. The exhaust area shall be screened with material having a maximum hole diameter of 0.125 inch. A removable fan plate shall be furnished with a 100 CFM ball bearing fan controlled by an adjustable thermostat. An incandescent light shall also be mounted to this plate.

Eight (8) phase cabinets shall be "P" type and supplied with 2 shelves as manufactured by Econolite.

A "P" type shell will be approximately 56 inches high, 38 inches wide and 26 inches deep excluding the door.

- 2. *Cabinet Wiring.* All conductors used shall be 19 strand #22 AWG or larger Type B nylon jacketed polyvinyl chloride or irradiated cross linked polyethylene. Conductors that are # 14 AWG or larger as an option shall be UL type THHN. The cabinet ground conductor feeding the ground point within the cabinet shall have the same amperage as the main breaker. A single #14 AWG conductor shall supply no more than 3 load switches. If each load switch is wired separately, then # 16 AWG or larger conductor shall be used.

The signal common ground buss (AC-) shall not be grounded to the cabinet and shall provide at least 10 terminals. An earth ground buss shall be provided and have at least 6 terminals. Wiring within the cabinet shall be neatly arranged and laced or enclosed in a protective sleeve. All crimp style connectors shall be applied with a proper tool which prevents opening of the handles until the crimp is completed.

3. *Cabinet Components.* Each cabinet shall be supplied with a surge arrester comprised of at least a metal oxide transient suppressor and a dual gas tube suppressor.

The metal oxide suppressor shall have:

Recurrent Peak Voltage:	150 VDC
Energy Rating, Maximum:	20 Joules
Power Dissipation, Average:	0.85 Watts
Peak Current for Less than 7 Microseconds:	1250 amperes

The dual gas tube shall have:

Breakdown:	300-500 VDC
Impulse Breakdown:	Less than 1000V in less than 1.1 microseconds at 10KV/USEC
Operating Delay:	Less than 0.1 US when measured by applying 1500 VDC in less than 0.1 US.
Energy Application:	Withstands 20 AMP AC for 1 second applied 10 times at 3 minute intervals on either side
Current Rating:	40,000 amp (8/20 impulse)
Capacitance:	6 Picofarads, line to GND

A radio interference suppressor (RIS) shall be supplied and be hermetically sealed in a substantial metal case filled with a suitable insulating compound. Four phase cabinets shall have RIS rated for 30 AMP minimum, 8 phase cabinets shall have RIS rated at 60 AMP minimum.

Three circuit breakers shall be provided which are UL approved and of the magnetic type. Breakers shall be quick-break type on either manual or automatic operation. The operating mechanism shall be enclosed and shall be trip-free from the operating handle on overload and be trip-indicating. The main breaker on a 4 phase cabinet shall be 30 AMP and on an 8 phase cabinet shall be 50 AMP. A 15 AMP breaker shall be used to power the controller, conflict monitor, and detectors. A 15 AMP breaker shall be wired from incoming AC power and supply the fan, cabinet light, and ground fault interrupter outlet.

The fan located on the vent panel shall be fused at 125% of its motor amperage. A mercury contactor shall be used to switch AC power to the load switches and its amperage shall match or exceed the main breaker amperage.

The switch compartment located on the outside of the main door shall have an auto/flash and signal lights on/off switch. The police panel auto/flash switch shall restart the controller when switched from the flash to the auto position. This switch shall also stop time the controller in the flash position if the stop time switch is in the flash stop timing position.

A panel located on the inside of the main door shall have a fuse holder and fuse for the vent panel's fan, controller on/off switch, auto/flash switch, stop time /on/off/flash stop timing switch, and a ground fault interrupter outlet. As an option, the ground fault interrupter outlet may be supplied on the load switch panel. The conflict monitor shall stop time the controller regardless of the switch positions.

Detector test switches shall be provided on the inside door panel and shall be momentary type push button switches used to place manual calls into the controller during actuated operation. These switches shall be in parallel with detector amplifier relay closure circuits. One switch will be provided for each vehicle phase and pedestrian phase.

Door switches of the push button type shall be provided to turn off the cabinet light and controller display when the door is closed.

The load bay panel shall be designed to allow access to the back plane for servicing. Wing nuts or other threaded fastening devices which are hand loosened or hand tightened shall be provided. The panel shall be designed to separate from the cabinet without the need to remove any internal cabling. Unsoldering wires to remove this panel is unacceptable. Connections to all load bay components can be crimped or push-on connectors.

A system interface panel, with necessary cables, shall be installed on the left side wall of the cabinet. This interface panel shall have all termination points to effect all inputs and outputs of the latest version of the Econolite Zone Monitor Closed Loop Signal System. At a minimum, all monitoring functions are to be installed. System detectors will be installed as called for on the plans.

4. *Detection.* Eight phase cabinets shall be supplied with a permanently fixed 7 slot card rack. A power supply plug-in module capable of supplying +24 VDC power to each slot shall be provided with the card rack.
5. *Flasher.* The cabinet shall be equipped for alternating flashing operation of signal lights with a 2 circuit solid state flasher in accordance with latest NEMA specifications (15 AMP per circuit).
6. *Load Switches.* The load switches shall be in accordance with the latest NEMA specifications and shall have 3 input and 3 output L.E.D. indications on the front panel. The load switches shall contain 3 separate cube type solid state relays and shall have triacs rated for 25 AMPS but de-rated to 10 AMP when used in the load switch assembly. Cabinets shall be supplied with the correct number of load switches necessary to accomplish the phasing as shown on the plans.
7. *Flash Transfer Relay.* Flash transfer relays shall be as manufactured by Midtex Model #136-62T3A1, 120 VAC, DPDT, 30 AMP with Jones plug base and dust cover or approved equal. One flash transfer relay shall be provided for every two vehicular traffic phases (including overlaps).
8. *Conflict Monitors/Malfunction Management Unit (MMU).* The conflict/voltage monitor shall comply to Part 6 of NEMA Standard TS-1, 1983. Bidders will be required to supply documentation with their bid from an independent laboratory that the conflict monitors they propose to furnish have passed all NEMA certification and environmental tests. In addition, the unit must also be capable of detecting the following error conditions:
  - A. Simultaneous sensing of active yellow and green inputs on a channel.
  - B. Simultaneous sensing of active red and green or yellow inputs on a channel.

If either of these conditions exist for less than 200MS, the unit shall not trigger. If either of these conditions exist for more than 500MS, the unit shall trigger.

- C. Absence of a 2.8 second period of an active yellow input on a channel during red to green to yellow to red sequence.

Functions #1 and/or #2 and #3 shall be enabled on a per channel basis via front panel accessible programming devices. One or both of the above dual combinations (#1 & #2) shall be selectable via front panel accessible programming devices.

- D. Absence of a logic input transition from the cabinet controller watchdog circuitry for 1500MS (+/- 100MS) shall cause the unit to trigger. This function shall be enabled via a front panel accessible programming device.

- E. Absence of or an improperly seated programming card shall cause the unit to trigger.

Should one of these conditions exist which triggers the unit, it shall cause the output relay contacts to transfer. These contacts shall remain in this state until the unit is reset by activation of front panel control of the external reset input. AC+ power interruption shall not reset the unit once it has been triggered. Upon restoration of AC+ power to the unit, all display indications shall return to their original state before the interruption.

- F. A voltage monitor latch function shall be provided which will sense an improper voltage level at the controller voltage monitor input or either of the +24 V monitor inputs and cause the unit to trigger. If this function is enabled via a front panel accessible programming device, restoration of proper voltage levels will not reset the unit. Only a manual reset or external reset will reset the unit.
- G. When the AC+ line voltage is below the drop-out level of 92VRMS for 475MS (+/-25MS), the unit will suspend all fault monitoring functions, de-energize the output relay, and de-energize the start relay. The power indicator on the front panel will blink at a rate of 2HZ to indicate the brown-out status.

When the AC+ line voltage returns above the restore level of 100 VRMS for 100 MS (+/-16 MS), the monitor will resume normal operation and the power indicator on the front panel will remain illuminated. After a 2.5 second (+/-1 second) delay, the start relay will be energized. After a programmable delay determined by

front panel accessible programming device, the output relay will be energized. The delay shall be programmable from 4 seconds to 15 seconds in 1 second increments. A 0.5 second delay shall be provided for test purposes.

- H. An internal watchdog shall be provided to assure continuous operation of internal microprocessor device. Failure of this circuitry to detect a logic input transition from the microprocessor device for 100 MS or a DC supply voltage sufficient to assure proper operation shall cause the unit to trigger.
- I. If a reset command is received from either the front panel control or the external reset input for a continuous duration of more than 120 seconds, the unit will ignore the reset command and begin normal monitoring functions.
- J. A real time clock shall be provided to mark the date and time when the unit is triggered by an error condition. Backup power to the real time clock shall allow it to maintain timing accuracy during interruptions of AC+ power to the unit. Automatic adjustments should be made to the time of day and date to accommodate leap years and daylight savings time.
- K. In addition to displaying the fault status and field output status for an error condition which may have the monitor unit currently triggered, the unit shall maintain a complete record of at least the last 9 faults which caused the monitor to trigger. These events should be able to be reviewed at any time via activation of a front panel control. This fault record shall not be lost due to AC+ power interruptions.
- L. All critical timing functions shall be accomplished by digital methods and shall utilize either the power line frequency or a quartz crystal based timer. All monitoring functions except conflict monitoring shall have a dedicated timer unique to each channel being monitored.
- M. A field input monitoring function (BND) shall be provided to sense improper input wave forms on the field signal inputs. Improper inputs may result from irregularly rapidly blinking (flickering) inputs, constant extraneous noise, or dimming operations other than half-waved suppressed.
- N. The monitor unit shall be capable of verifying the program card information by displaying the channels programmed as permissive in a sequential fashion for each channel monitored via front panel control.
- O. The monitor unit shall be capable of displaying the fault timing values being used to trigger the monitor for conflicts, red failures, controller voltage monitor (CVM) and 24V monitor (24 V-I & 24 V-II) conditions, dual indications, clearance failures and controller watchdog failures (if enabled) via front panel control. If any fault monitoring functions are disabled by control inputs, red enable or +24V monitor inhibit, this shall be indicated. Channels which are selected for dual indication and clearance monitoring via the front panel accessible programming devices shall also be displayed.
- P. An infrared LED output shall be provided to transfer to a hand held printer all internal settings and previous faults. The printer is not required at this time.
- Q. The power, fault, and monitor fail indicator shall be LED type. All other displays and indications shall be LCD type. The minimum display indicators are required as follows:
  - i. Triggering of the conflict monitoring portion of the unit.
  - ii. Triggering of the red monitoring portion of the unit.
  - iii. Triggering of the sequence monitoring portion of the unit.
  - iv. Triggering of the dual monitoring portion of the unit.
  - v. Triggering of the controller voltage monitoring or controller watchdog monitoring portion of the unit.
  - vi. Triggering of the +24V monitor #1 portion of the unit.
  - vii. Triggering of the +24V monitor #2 portion of the unit.
  - viii. Triggering of the program card monitoring portion of the unit.
  - ix. Triggering of the internal watchdog portion of the unit.
  - x. Time of day and date display.
  - xi. Four indications per channel which display an active red, yellow, or green input for each channel monitored.
  - xii. AC+ power indicator which is flashing when AC+ power is below 92 VRMS and illuminated when AC+ line voltage returns above 100 VRMS.
  - xiii. One indicator per channel which identifies a channel as being involved in an error condition which has triggered the unit.
  - xiv. Triggering of the field input monitoring (BND) portion of the unit.

Eight (8) phase cabinets shall be supplied with a Malfunction Management Unit (MMU).

9. *Documentation.* Two paper copies of the cabinet prints shall be accurate and complete and shipped with each cabinet. An additional copy shall be supplied in digital format (DXF) on 3.5 inch high density diskette. If additions or deletions are necessary to the cabinet as supplied, a new print will be supplied. Corrections to an existing print will not be accepted. A quality assurance sheet shall be supplied stating the following:
  - A. The date of the test.
  - B. The duration of the test.
  - C. The method of testing.
  - D. If the testing involved components, the manufacture and model number of the devices used.
  - E. The technician's signature (not initials).
  - F. Quality control supervisor's signature (not initials).
  - G. The serial number or other unique identifier of the cabinet.

Subsection 614.08 (d) shall include the following:

Detector units shall be card rack mounted plug-in type 3M Canoga 400 4-channel units.

Subsection 614.08 (e) shall include the following:

Micro Detector shall be as supplied by 3M Micro Probes.

Subsection 614.08 (f) shall include the following:

The push-button assembly shall meet the requirements for accessible pedestrian signals as outlined in the latest edition of the "Manual of Uniform Traffic Control Devices" Chapter 4E. Installation shall be done in accordance with the manufacturer's specifications.

Subsection 614.08 (g) shall include the following:

Traffic signal poles, pedestals, and mast arms shall be of the general configuration shown on Standard Drawings. All traffic signal poles and mast arms shall be designed to meet the requirements outlined in the latest edition of "Standard Specifications for Structural Supports for Highway Signs, Luminaries, and Traffic Signals", published by AASHTO, for a wind velocity of 90 mph with a 1.3 gust factor. Signal poles shall be supplied with a 16.5 inch bolt pattern for mast arms 35 feet and less or with a 20 inch bolt pattern for mast arms in excess of 35 feet. Hand holes are to be supplied at the base and across from the mast arm fitting.

Subsection 614.08 (h) shall include the following:

(h) *Traffic Signal Faces.*

1. *Traffic Signal Units.* All signal units shall be of the individual section, adjustable type, black polycarbonate. Signal units shall be supplied by Eagle, IDC or Econolite.

Programmable heads shall be Cast Aluminum frame units supplied by 3M.

Visors shall be detachable, 12 inch tunnel type, open at the bottom; be black in color on the outside and flat black on the inside.

Reflector shall be silvered glass or Alzak type units.

Lenses shall be in accordance with Institute of Transportation Engineers (ITE) Specifications.

Sockets shall be fixed focus.

Doors on the signal heads for the installation of lamps and lens replacement or other maintenance shall not require use of any tool to be opened. Doors and lenses shall be equipped with neoprene weather proof gaskets to ensure against infiltration of moisture, road film and dust. Each three-color signal unit shall have the socket leads from all signal sections connected to a terminal board stamped identifiable with terminals. There shall be a terminal for color indication plus a common terminal where one lead from each socket shall terminate. The terminal board shall be mounted in the middle section and be properly insulated. All openings, top and bottom, shall be for 1 ½ inch pipe or pipe mounting brackets. Gaskets shall be supplied for top and bottoms openings.

2. *Pedestrian Signal Units.* 18 inch one-way ICC pedestrian signal head as specified on the plans. The specifications are the same as subsection 614.08 (h) with the following exceptions:

- A. Walk/Don't Walk Indications shall be symbolized and side by side.
- B. Visors shall be egg crate type and heads shall be black.

3. *Countdown Pedestrian Signal Units.* Single, self-contained retrofit module for clamshell housing.

Two message overlay combining Portland Orange LED for the "Hand" and White LED for "Walking Man."

Double digit display for countdown made of Red LED's.

Timing is derived directly from the controller and no timing shall be programmed, or otherwise initiated.

Countdown numerals shall be illuminated continuously during countdown and not alternating.

Pedestrian signal head shall blank out countdown portion if the countdown is different than the controller.

Hand/Man indications shall be solid style, not outline.

Countdown pedestrian signals shall consist of Portland orange numbers that are at least 150 mm (6-inch) in height on a black opaque background. The countdown pedestrian signal shall be located immediately adjacent to the associated UPRAISED HAND (symbolizing DONT WALK) pedestrian signal head indication.

The display of the number of remaining seconds shall begin only at the beginning of the pedestrian change interval. After the countdown displays zero, the display shall remain dark until the beginning of the next countdown.

The countdown pedestrian signal shall display the number of seconds remaining until the termination of the pedestrian change interval. Countdown displays shall not be used during the walk interval, or during the yellow change interval of a concurrent vehicular phase.

4. *LED Traffic Signal Faces.* All traffic signal faces (vehicular and pedestrian) shall be Light Emitting Diode (LED) type, unless otherwise specified by the City. The LED traffic signal faces shall conform to the requirements of subsection 713.11.

Subsection 614.08 (i) shall include the following:

All back plates are to be of aluminum. Back plates shall provide a minimum 8 inch border for all 8 and 12 inch signal heads.

Delete subsection 614.08 (k) and replace with the following:

(k) *Traffic Signal Electrical Conductors and Control Cable.* Conductors and cables shall conform to subsection 713.11.

- A. *Signal Cable.* #14 AWG multi-conductor stranded copper wire manufactured to meet IMSA 19-1 specifications or approved equivalent. Each conductor in the cable will be individually insulated and rated at 600 volts. There shall be a minimum of 4 and a maximum of 9 strands per conductor. As a minimum, one spare conductor shall be provided for each cable run.
- B. *Telephone Interconnect Cable.* The telephone interconnect wire shall be #19 AWG, 6 twisted pairs, shielded cable, with petrolatum-polyethylene gel filling compound. The cable shall meet R.E.A. Specification PE-39 (Clifford of Vermont Catalog #6P19-B1-BJFC or approved equal).

No splicing of the interconnect cable will be allowed. The cable shall be installed between two adjacent controller cabinets in continuous runs.

All telephone interconnect cable pairs will be connected to either active or spare terminal points provided in the controller cabinet. The Contractor shall identify and label all terminal points.

All interconnect wires shall be checked after installation to determine their resistance and residence to ground. Each pair shall be shorted together at one end and a resistance check will be made at the other end. Resistance will be checked between each conductor and ground. All resistance readings shall be recorded showing value, color and location of wire. Data is to be supplied to the City within 30 days of completion of the project.

At the terminal points the jackets shall be stripped and the ends taped. Gel filling compound shall be removed using filled cable cleaner.

- C. *Fiber Optic Interconnect Cable.* Where specified on the plans, interconnect wire connecting traffic signal controller cabinets shall be fiber optic type. Fiber optic cable runs consist of a main cable, which runs the length of the project, and connects to the individual local controller cabinets.

Fiber optic cable shall be loose tube non-armored outdoor cable consisting of 24 single mode fibers and 12 multi-mode fibers and complying with the following specification for fiber optic cable. Fiber optic cable for installation in conduit shall meet the applicable portions of I.M.S.A. Specification 60-2 or approved equal. A 16 gauge (minimum) stranded trace wire shall be installed in the conduit with the fiber cable.

- A. *General Considerations.* The fiber optic cable shall meet all requirements stated in the specification. The cable shall be an accepted product of the United States Department of Agriculture Rural Electrification Administration (REA) as meeting requirements of 7CFR1755.900.

The cable shall be new, unused and of current design and manufacture.

Connectors shall be "ST" single mode type.

- B. *Fiber Characteristics.* All fibers in the cable must be usable fibers and meet this specification:

All optical fibers shall be sufficiently free of surface imperfections and inclusions to meet the optical, mechanical and environmental requirements of this specification.

Each optical fiber shall consist of a doped silica core surrounded by a concentric silica cladding.

The single-mode fiber utilized in the cable specified herein shall conform to the following specifications:

Typical Core Diameter:	8.3 $\mu\text{m}$ .
Cladding Diameter:	125.0 $\pm$ 1.0 $\mu\text{m}$ .
Core-to-Cladding Offset:	$\leq$ 0.8 $\mu\text{m}$ .
Cladding Non-Circularity:	1.0%.
Defined as: [1-(min. Cladding dia. + max. Cladding dia.)] X 100	
Coating diameter:	245 $\pm$ 10 $\mu\text{m}$ .
Colored Fiber Diameter:	nominal 250 $\mu\text{m}$ .
Attenuation Uniformity:	No point discontinuity greater than 0.10 dB at either 1310 nm or 1550 nm.
Attenuation at the Water Peak:	The attenuation at 1383 $\pm$ 3 nm shall not exceed 2.1 dB/km.
Cutoff Wavelength:	The cabled fiber cutoff wavelength shall be $\leq$ 1250 nm.
Mode-field Diameter (Petermann II):	9.30 $\pm$ 0.50 $\mu\text{m}$ at 1310 nm 10.50 $\pm$ 1.00 $\mu\text{m}$ at 1550 nm
Zero Dispersion Wavelength:	( $\lambda_0$ )-1301.5 nm $\leq$ ( $\lambda_0$ ) $\leq$ 1321.5 nm.
Zero Dispersion Slope:	( $S_0$ )- $\leq$ 0.092 ps/(nm <sup>2</sup> km)

The coating shall be a dual layered, UV cured acrylate applied by the fiber manufacturer. The coating shall be mechanically strippable without damaging the fiber.

- C. *Fiber Specification Parameters.* All fibers in the cable shall meet the following requirements:

When tested in accordance with FOTP-3, "Procedure to Measure Temperature Cycling Effects on Optical Fiber, Optical Cable and Other Passive Fiber Optic Components", (single-mode only), the average change in attenuation at extreme operational temperatures (-40°C to +70°C) shall not exceed 0.05 dB/km at 1550 nm. The magnitude of the maximum attenuation change of each individual fiber shall not be greater than 0.15dB/km at 1550 nm.

Required Fiber Grade - Maximum Individual Fiber Attenuation

The maximum dispersion for single mode optical fibers shall be  $\leq$ 3.3ps/(nm.km) for 1285 nm through 1330 nm and shall be  $\leq$ 18ps/(nm km) at 1550 nm.

Specifications for Outdoor Cables:

- i. Optical fibers shall be placed inside a loose buffer tube.
- ii. Each buffer tube shall contain up to 6 fibers.
- iii. The fibers shall not adhere to the inside of the buffer tube
- iv. Each fiber shall be distinguishable from others by means of color coding or numbers according to the following:
  - a. Blue
  - b. Orange
  - c. Green
  - d. Brown
  - e. Slate
  - f. White

The above colors shall meet EWTIA-598, "Color Coding of Fiber Optic Cables".

- v. Buffer tubes containing fibers shall also be color coded or numbered with distinct and recognizable colors or numbers according to the following:
  1. Blue
  2. Orange
  3. Green
  4. Brown
  5. Slate
  6. Red
  7. Black
  8. Yellow
  9. Violet
  10. Rose

The above colors shall meet EMIA-598, "Color coding of Fiber Optic Cables".

- vi. In buffer tubes containing multiple fibers, the colors or numbers shall be stable during temperature cycling and not subject to fading or smearing onto each other or into the gel filling material. Colors shall not cause fibers to stick together.
- vii. Buffer tubes shall be of a dual-layer construction with the inner layer made of polycarbonate and the outer layer made of polyester.
- viii. Fillers may be included in the cable core to lend symmetry to the cable cross-section where needed.
- ix. The central anti-buckling member shall consist of a glass reinforced plastic rod. The purpose of the central member is to prevent buckling of the cable.
- x. Each buffer tube shall be filled with a non-hygroscopic, non-nutritive to fungus, electrically non-conductive, homogenous gel. The gel shall be free from dirt and foreign matter. The gel shall be readily removable with conventional nontoxic solvents.
- xi. Buffer tubes shall be stranded around a central member using the reverse oscillation, or 'TZ', stranding process.
- xii. The cable core interstices shall be filled with a water-blocking compound. The compound shall be a thixotropic gel containing a Super Absorbent Polymer (SAP) material. The gel shall be non-nutritive to fungus, electrically non-conductive and homogenous. The gel shall be free from dirt and foreign matter and shall be readily removable with conventional nontoxic solvents.
- xiii. Binders shall be applied with sufficient tension to secure the buffer tubes to the central member without crushing the buffer tubes. The binders shall be non-hygroscopic, non-wicking (or rendered so by the flooding compound), and dielectric with low shrinkage.
- xiv. The cable shall contain at least one ripcord under the sheath for easy sheath removal.
- xv. Tensile strength shall be provided by high tensile strength aramid yarns, fiberglass yarns, or both.
- xvi. The high tensile strength aramid yarns and/or fiberglass yarns shall be helically stranded evenly around the cable core.

xvii. All-dielectric cables (with no armoring) shall be sheathed with medium density polyethylene. The minimum nominal jacket thickness shall be 1.4mm. Jacketing material shall be applied directly over the tensile strength members and flooding compound. The polyethylene shall contain carbon black to provide ultraviolet light protection and shall not promote the growth of fungus.

xviii. The jacket or sheath shall be free of holes, splits and blisters.

xix. The cable jacket shall contain no metal elements and shall be of a consistent thickness.

xx. Cable jackets shall be marked with sequential meter or foot markings, year of manufacture and a telecommunication handset symbol, as required by Section 350G of the National Electrical Safety Code (NESC). The actual length of the cable shall be within  $-0/+1\%$  of the length markings. The marking shall be in contrasting color to the cable jacket. The height of the marking shall be approximately 2.5 mm.

xxi. The maximum pulling tension shall be 2700 N (608 lbf) during installation (short term) and 890 N (200 lbf) long term installed.

xxii. The shipping, storage and operating temperature range of the cable shall be  $-40^{\circ}\text{C}$  to  $+70^{\circ}\text{C}$ . The installation temperature range of the cable shall be  $-30^{\circ}\text{C}$  to  $+70^{\circ}\text{C}$ .

- D. *General Cable Performance Specifications.* The un-aged cable shall withstand water penetration when tested with a one meter static head or equivalent continuous pressure applied at one end of a one meter length of filled cable for 24 hours. No water shall leak through the open cable end. When a one meter static head or equivalent continuous pressure is applied at one end of a one meter length of aged cable for one hour, no water shall leak through the open cable end. Testing shall be done in accordance with FOTP-82, "Fluid Penetration Test for Filled Fiber Optic Cable".

When tested in accordance with FOTP-81, "Compound Flow (Drip) Test for Filled Fiber Optic Cable", Method A; the cable shall exhibit no flow (drip or leak) of filling or flooding compound at  $80^{\circ}\text{C}$ . If material flow is detected, the weight of any compound that drips from the sample shall be less than 0.05 grams (0.002 ounce).

The cable shall withstand a minimum compressive load of 220 N/cm (125lbf/in) for non-armored cables applied uniformly over the length of the compression plate. The cable shall be tested in accordance with FOTP-41 "Compressive Loading Resistance of Fiber Optic Cables", except that the load shall be applied at the rate of 3 mm to 20 mm per minute and maintained for 10 minutes. The magnitude of the attenuation change shall be within the repeatability of the measurement system for 90% of the test fibers. The remaining 10% of the fibers shall not experience an attenuation change greater than 0.1 dB at 1550 nm (single-mode). The average increase in attenuation for the fibers shall be  $\leq 0.02$  dB at 1300 nm (multimode). The repeatability of the measurement system is typically  $\pm 0.05$  dB or less. No fibers shall exhibit a measurable change in attenuation after load removal.

When tested in accordance with FOTP-104, "Fiber Optic Cable Cyclic Flexing Test", the cable shall withstand 25 mechanical flexing cycles at a rate of  $30 \pm 1$  cycles per minute, with a sheave diameter not greater than 20 times the cable diameter. The magnitude of the attenuation change shall be within the repeatability of the measurement system for 90% of the test fibers. The remaining 10% of the fibers shall not experience an attenuation change greater than 0.1 dB at 1550 nm (single-mode). The repeatability of the measurement system is typically  $\pm 0.05$  dB or less. The cable jacket shall exhibit no cracking or splitting when observed under 5X magnification.

When tested in accordance with FOTP-25, "Repeated Impact Testing of Fiber Optic Cables and Cable Assemblies", the cable shall withstand 25 impact cycles. The magnitude of the attenuation change shall be within the repeatability of the measurement system for 90% of the test fibers. The remaining 10% of the fibers shall not experience an attenuation change greater than 0.1 dB at 1550 nm (single-mode). The repeatability of the measurement system is typically  $\pm 0.05$  dB or less. The average increase in attenuation for fibers shall be  $\leq 0.04$  dB at 1300 nm (multimode). The cable jacket shall not exhibit evidence of cracking or splitting at the completion of the test.

When tested in accordance with FOTP-33, "Fiber Optic Cable Tensile Loading and Bending Test", using maximum mandrel and sheave diameter of 560 mm, the cable shall withstand a tensile load of 2700 N (608 lbf) applied for one hour (using "Test Condition II" of the procedure). In addition, the cable sample, while subjected to a minimum load of 2660 N (600 lbf), shall be able to withstand a twist of 360 degrees in a length of less than 3 meters. The magnitude of the attenuation change shall be within the repeatability of the measurement system of 90% of the test fibers. The remaining 10% of the fibers shall not experience an

attenuation change greater than 0.1 dB at 1550 nm. The repeatability of the measurement system is typically  $\pm 0.05$  dB or less. The average increase in attenuation for fibers shall be  $\leq 0.40$  dB at 1300 nm (multimode). The cable shall not experience a measurable increase in attenuation when subjected to the rated residual tensile load, 890 N (200lbf).

When tested in accordance with FOTP-85, "Fiber Optic Cable Twist Test", a length of cable no greater than 2 meters will withstand 10 cycles of mechanical twisting. The magnitude of the attenuation change will be within the repeatability of the measurement system for 90% of the test fibers. The remaining 10% of the fibers will not experience an attenuation change greater than 0.1 dB at 1550 nm. The repeatability of the measurement system is typically  $\pm 0.05$  dB or less. The average increase in attenuation for fibers shall be  $\leq 0.40$  dB at 1300 nm (multimode). The cable jacket will exhibit no cracking or splitting when observed under 5X magnification after completion of the test.

When tested in accordance with the proposed FOP-181, "Lighting Damage Susceptibility Test for Fiber Optic Cables with Metallic Components", the cable shall withstand a simulated lighting strike with a peak value of the current pulse  $\geq 105$  kA. The test current used shall be damped oscillatory with a maximum time-to-peak value of 15 $\mu$ s (which corresponds to a minimum frequency of 16.7 kHz) and a maximum frequency of 30 kHz. The time of half-value of the waveform envelope ( $t_2$ ) shall be from 40 - 70 $\mu$ s. In addition to the analysis criterion set forth in FOTP-181, the integrity of the buffer tubes (or analogous loose tube, i.e., core tube) and strength members must be intact after removal of the cable specimens from the test box.

- E. *Quality Assurance Provisions.* All optical fibers shall be proof tested by the fiber manufacturer at a minimum load of 100 ksi.

All optical fibers shall be 100% attenuation tested. The attenuation of each fiber shall be provided with each cable reel.

- F. *Packaging.* The complete cable shall be packaged for shipment on non-returnable wooden reels.

Top and bottom ends of the cable shall be available for testing.

Both ends of the cable shall be sealed to prevent the ingress of moisture.

Each reel shall have a weatherproof reel tag attached identifying the reel and cable.

Each cable shall be accompanied by a cable data sheet that contains significant information on the cable.

- G. *Miscellaneous.* The cable manufacturer shall provide installation procedures and technical support concerning the items contained in this specification.

- H. *Testing.* When fiber optic cable is installed, the fiber optic cable test shall consist of the testing of both multimode and single mode fiber optic cable. The testing procedures involve an OTDR test and an Optical Power Meter Test.

The guidelines for fiber optic cable testing include:

- i. Test jumpers and patch cords must be of the same fiber core size and connector type as the cable system:
  - (1) Multimode fiber 62.5/125  $\mu$ m
  - (2) Singlemode fiber 8.3/125  $\mu$ m
- ii. The light source and OTDR must operate within the range of 850 $\pm$ 30 nm or 1300 $\pm$ 20 nm for multimode testing in accordance with ANSI/EIA/TIA-526-14.
- iii. The light source and OTDR must operate with the range of 1310 $\pm$ 10 nm or 1550 $\pm$ 20 nm for singlemode testing in accordance with ANSI/EIA/TIA-526-7.
- iv. The power meter and the light source must be set to the same wavelength during testing.
- v. The power meter must be calibrated and traceable to the National Institute of Standards and Technology (NIST).

- vi. All system connectors, adapters and jumpers must be cleaned as per manufacturer's instructions before measurements are taken.
- I. *Service Cable.* 2 #THHN-8, 7 strands tinned soft drawn copper wire, 1/16 inch neoprene insulation, black and white in color. Conductors shall be twisted.
- J. *Loop Wire.* Single conductor #14, stranded THHN as supplied by Detect-A-Duct.
- K. *Pedestrian Push-button Cable.* One 3 conductor #14 seven strands tinned soft drawn copper wire, 1/16 inch neoprene insulation, conductors to be twisted. Color coded, 1 white, 1 red, and 1 black.
- L. *Loop Lead-In Cable.* 2 conductor, Canoga CC3003.
- M. *Ground.* Single conductor, AWG #6, soft drawn bare solid copper wire.

Add subsections 614.08 (m) – (s) as follows:

(m) *Video Detection.* Where specified on the plans, video detection shall be installed. The following describes the minimum requirements for providing a complete Video Detection System. Initially, the system shall be capable of providing presence vehicle detection at selected intersections. The video system shall be expandable without removing or replacing existing units.

Acceptable systems include that of any manufacturer, provided such equipment meets all qualifying specifications identified herein. Using standard image sensor optics and in the absence of occlusion, the system shall be able to detect vehicle presence with 98% accuracy under normal conditions (days and nights), and 96% accuracy under adverse conditions (fog, rain, snow).

All items and materials furnished shall be new, unused, current production models installed and operational in a user environment and shall be items currently in distribution. The products algorithms shall have a proven record of field use at other installations for at least two (2) years of service i.e., not including prototype field trials prior to installation.

1. *General.* These technical specifications describe the minimum physical and functional properties of a video detection system. The system shall be capable of monitoring all licensed vehicles on the roadway, providing video detection for areas outlined in the construction drawings. The entire video detection system shall consist of the following:
  - A. Video Image processing unit(s)
  - B. Video Camera(s) with IR filter, enclosure, and sunshield
  - C. Camera Lens
  - D. Surge suppresser
  - E. All other necessary equipment for operation
2. *Video Image Processing Unit.* The Video Image Processing Unit shall be Traficon Model VIP3.1 or VIP3.2, the second releases of the VIP3 board. The new boards shall fit directly into the 170 and NEMA racks without an interface box. The VIP3.1 shall monitor one camera and the W3.2 shall monitor two (2) separate cameras. Video inputs to either unit shall enter through the input file or detector rack edge connector. The Video Image Processing Unit shall be located on one module, daughter PC cards connected through ribbon cables shall not be allowed.

On each camera the presence is detected on 24 zones. Counting data can be stored for up to 6 different lanes. The up to 4000 records stored on board can be retrieved via a RS232 port on the front. All probes (24 for two cameras) can be combined in different relationships (AND, OR, NOT) to 24 outputs. 20 digital inputs to allow to expand the conditional output with external equipment. Also conditional count is possible. All probes and parameters can be changed without stopping the detection. For example: when one probe is modified all probes continue to work, including the one that is being modified. When the new position is confirmed, the new probe will enter a learning phase. Once the new probe is in function, it will take over the job of the old one. In this way, the detector is always fully operational with no interrupt on any probe, even during modification.

Four detector configurations can be stored on board. Software download from PC via serial port is possible.

Specifications:

- A. 1 or 2 camera inputs
- B. 24 digital outputs
- C. 20 digital inputs
- D. Fits direct into the 170 and NEMA rack without additional adapter
- E. 24 direction sensible detector probes per camera, including up to 6 counting probes per camera
- F. Stores counts for 4000 intervals
- G. Detection results of all detection probes can be combined with the inputs to the related outputs. AND, OR, NOT
- H. 4 configurations stored on board
- I. Modifications with no interruption on all probes
- J. Setup via keypad and monitor (no pointing device needed)
- K. Software update via RS232

The video detection board will have only 4 outputs and will use expansion boards for additional input and output. The video detection (Main) board will have the following on the front:

- A. One Male DB9 for connection with the first expansion board
- B. One Female DB9 for setup with keypad (Service port)
- C. LEDs for outputs on board (2 for cam 1 and 2 for camera 2), power, Video Cam 1 and Video Cam2, Communication with expansions
- D. One video output for setup via keypad
- E. A switch to select which image to be on the service output

The input/output expansion board will have the following on the front:

- A. LED's for power, Expansion communication, In/output activity
- B. 2 DB9 ports for communication with Master or other expansion boards
- C. An 8-dipswitch device to select the following:
  - i. Input or Output Range: 1-12 or 13-24
  - ii. Input or Output number (see example for more info)

- (n) *On Street Master Controller.* The traffic signal master controller shall be an Econolite ASC 2 or ASC 2M master controller with most recent software version. No equal or equivalent will be considered.

The master controller shall be wired into a cabinet assembly which also includes a local intersection equipment configuration. The cabinet shall be wired complete with master connecting cables in accordance with applicable portions of the local controller cabinet specifications. The incoming power service and interconnect terminals shall be adequately equipped with surge arrestors to protect against high energy transients.

- (o) *Miscellaneous Hardware.*

- 1. Aluminum pedestal mounts (Type ITT) shall be either of two types as called for in the plans specifications:
  - A. Center mount with two side ports plain
  - B. Offset mount separated with one side port
- 2. Covers for valve pull boxes shall have the word "Traffic" cast into them to avoid confusion with water valve boxes.

- (p) *Instructions and Wiring Diagrams.* All equipment shall be provided with complete installation instructions, including a complete chart of field connections, as well as manuals for the controller containing service instructions including wiring diagrams, troubleshooting procedures, etc. Each and every component used shall be clearly referenced in the service manual and its value, ratings and manufacturer's part number shall be given.

- (q) *Emergency Vehicle Detectors.* Optical Communication Detectors for emergency vehicle pre-emption shall be the 3M Model 711, 712 or 722 Optical Detector or approved equivalent as specified in the construction plan notes. Placement of the Detectors shall be determined by the Engineer. Optical phase selector modules for emergency vehicle pre-emption shall be 3M Model M752 or approved equal.

- (r) *Uninterruptible Power Supply (UPS)*. A UPS shall be incorporated in all new traffic signals and where otherwise specified in the plans. UPS shall be "SH1200UR TRAFFIC UPS" as manufactured by Signal Sense or approved equal and shall be installed per manufacturer's specifications.

All UPS equipment shall be housed either entirely in the traffic signal cabinet or entirely in a separate cabinet, which matches the requirements of the traffic signal cabinet, as specified in the plans.

The UPS equipment shall include the following hardware:

1. Manual bypass switch to by which the UPS unit is bypassed and runs off utility power.
2. Generator receptacle accessible from the exterior of the cabinet with the UPS equipment.
3. Automatic sensor to detect generator power.
4. The UPS equipment shall include a display with the following indications, alarms, and faults:
  - A. Battery charge level.
  - B. UPS load level.
  - C. Presence or absence of a critical UPS fault.
  - D. Presence or absence of utility power.

The UPS equipment shall meet the following operational specifications:

1. Source input: 120 Vac, 60 Hz, single phase with input surge suppression.
2. Output: 120 Vac  $\pm$  3%, 60 Hz, single phase pure sine wave
3. Operating voltage range: 85 Vac – 135 Vac
4. Include the following user definable settings:
  - A. Full run time prior to the UPS transitioning to flash operation.
  - B. Battery level flash.
  - C. Trigger options to notify owner of critical events and/or failures.

The UPS equipment shall meet the following operational characteristics:

1. Installed in series with the utility power such that the UPS powers the entire traffic signal cabinet and all associated equipment.
2. Provide an automatic bypass by which the UPS unit is bypassed and runs off utility power if a critical internal UPS fault occurs.
3. Provide full signal operation for a minimum of one hour, with additional flash time for a minimum of two hours.
4. Operate in an always on condition continuously monitoring the input and shall provide continuous frequency and voltage regulation at the output. Upon loss of power, the UPS shall transfer to full UPS operation in < 5 ms.
5. Remain in or automatically transfer to flash operation when utility power AND the UPS battery levels are below, or fall below, the battery level flash setting.
6. Restore the signal to full operation when utility power is restored.
7. Operate under generator power under the following conditions:
  - A. Full signal operation regardless of the UPS battery charge levels.
  - B. Recharge the UPS batteries.
  - C. Bypass utility power.
  - D. If generator power fails, operates outside acceptable signal tolerances, or is disconnected, the UPS unit shall automatically revert back to either utility power or UPS battery power based on availability.
8. Recharge the UPS batteries within 10 hours.
9. Low battery cutout to prevent critical discharge of, and damage to, the UPS batteries.

- (s) *Thermal Detection*. Where specified on the plans, thermal detection shall be installed. The following describes the minimum requirements for providing a complete Thermal Detection System. Initially, the system shall be capable of providing presence vehicle detection at selected intersections. The thermal system shall be expandable without removing or replacing existing units.

Acceptable systems include that of any manufacturer, provided such equipment meets all qualifying specifications identified herein. Using standard thermal sensors and in the absence of occlusion, the system shall be able to detect vehicle and cyclist presence with 98% accuracy under normal conditions (days and nights), and 96% accuracy under adverse conditions (fog, rain, snow).

All items and materials furnished shall be new, unused, current production models installed and operational in a user environment and shall be items currently in distribution. The products algorithms shall have a proven record of field use at other installations for at least two (2) years of service i.e., not including prototype field trials prior to installation.

3. *General.* These technical specifications describe the minimum physical and functional properties of a thermal detection system. The system shall be capable of monitoring all licensed vehicles on the roadway, providing thermal detection for areas outlined in the construction drawings. The entire thermal detection system shall consist of the following:
  - A. Thermal Image processing unit(s)
  - B. Thermal Camera(s) with enclosure and sunshield
  - C. Camera Lens
  - D. Surge suppresser
  - E. All other necessary equipment for operation
4. *Thermal Image Processing Unit.* The Thermal Image Processing Unit shall be compatible with the Video Detection equipment specified in Sub-section 614.08 (m). The new boards shall fit directly into the 170 and NEMA racks without an interface box. Inputs shall enter through the input file or detector rack edge connector. The Thermal Image Processing Unit shall be located on one module, daughter PC cards connected through ribbon cables shall not be allowed.

On each camera the presence is detected on 24 zones. Counting data can be stored for up to 6 different lanes. The up to 4000 records stored on board can be retrieved via a RS232 port on the front. All probes (24 for two cameras) can be combined in different relationships (AND, OR, NOT) to 24 outputs. 20 digital inputs to allow to expand the conditional output with external equipment. Also conditional count is possible. All probes and parameters can be changed without stopping the detection. For example: when one probe is modified all probes continue to work, including the one that is being modified. When the new position is confirmed, the new probe will enter a learning phase. Once the new probe is in function it will take over the job of the old one. In this way, the detector is always full operational with no interrupt on any probe, even during modification.

Four detector configurations can be stored on board. Software download from PC via serial port is possible.

Specifications:

- L. 1 or 2 camera inputs
- M. 24 digital outputs
- N. 20 digital inputs
- O. Fits direct into the 170 and NEMA rack without additional adapter
- P. 24 direction sensible detector probes per camera, including up to 6 counting probes per camera
- Q. Stores counts for 4000 intervals.
- R. Detection results of all detection probes can be combined with the inputs to the related outputs. AND, OR, NOT
- S. 4 configurations stored on board
- T. Modifications with no interruption on all probes
- U. Setup via keypad and monitor (no pointing device needed)
- V. Software update via RS232

The thermal detection board will have only 4 outputs and will use expansion boards for additional input and output. The thermal detection (Main) board will have the following on the front:

- F. One Male DB9 for connection with the first expansion board
- G. One Female DB9 for setup with keypad (Service port)
- H. LEDs for outputs on board (2 for cam 1 and 2 for camera 2), power, Thermal Cam 1 and Thermal Cam2, Communication with expansions
- I. One video output for setup via keypad
- J. A switch to select which image to be on the service output

The input/output expansion board will have the following on the front:

- D. LED's for power, Expansion communication, In/output activity
- E. 2 DB9 ports for communication with Master or other expansion boards
- F. An 8-dipswitch device to select the following:
  - i. Input or Output Range: 1-12 or 13-24
  - ii. Input or Output number (see example for more info)

Subsection 614.10 (a) shall include the following:

1. *Intersection Power.* The contractor shall notify the Project Engineer 2 weeks prior to the signal turn-on so that orders may be issued to Xcel Energy for power connection to the intersection on the specified turn-on date.
2. All traffic signal equipment which is removed shall remain the property of the City. Such property shall be removed from the work site and returned by the Contractor to the City of Wheat Ridge Maintenance Facility, 11220 West 45th Place. Work relating to the salvage and delivery of salvage material to the City of Wheat Ridge Maintenance Facility will be incidental to the Project.
3. When existing traffic signal installations are modified or completely rebuilt, the Contractor shall work around existing traffic signal equipment until the new or modified traffic signal system has been installed and put into operation. If the existing traffic signal equipment must be removed to accommodate the new construction, the contractor shall, if directed by the Engineer, install temporary overhead traffic signal equipment. The contractor shall at all times maintain a minimum of 2 12 inch, three-section (red, yellow, green) traffic signal heads for each roadway approach. If, during construction, a traffic signal must be turned off so that there are no indications in one or more directions, the contractor shall, if so directed by the Project Engineer, provide a uniformed traffic officer to direct traffic. Provision of temporary signal equipment or uniformed traffic control will be paid for at contract unit prices or paid for as extra work
4. During construction, if traffic signal heads have been installed, but are not ready for actual electrical connection, such heads will be totally covered. If the covering material should come loose, the contractor must replace or repair covering within 6 hours of notification.
5. *Equipment List and Drawings.* The contractor shall submit with his Bid a list of equipment and material which he proposes to furnish, including all equipment and material as identified on the plans or in the specifications by the manufacturer's name which is necessary or customary in the trade to identify such equipment and material. The list shall be complete as to name of manufacturer, size and catalog number of unit, and shall be supplemented by such other data as may be required.

Inspection or sampling of any material other than those already approved according to the material specifications will be made by the Engineer or his designee prior to installation.

If the Contractor proposes a substitution of equipment called for in the plans or specifications, he shall provide additional information to prove the substitution item is of equal or superior quality. Any material and/or equipment installed by the Contractor that is not in conformance with these specifications will be removed or changed at the contractor's expense.

Upon completion of the work, the contractor shall submit "record drawings" or corrected plan showing in detail all construction changes, including, but not limited to, wiring, cable, and location and depth of conduit. This information is in addition to wiring diagrams and other required information.

Subsection 614.10 (b) shall include the following:

A common neutral conductor, separate from the signal light circuit neutral, shall be used for all low voltage circuits, including the detectors and pedestrian push-button circuit.

A small permanent tag with permanent markings on which the direction and phase is printed, in the order named, using the codes given in "Cable Schedule", shall be securely attached near the end of each conductor at each controller, standard, or pull box where conductors are separated. Where direction and phase are not clearly indicated by conductor insulation, additional tags shall be used.

<b>Cable Schedule</b>		
PHASE	COLOR OF TAPE	WIRE TAG
1- Northbound Left Turn	Red/White	NBLT
2- Northbound	Red	NB
3- Northbound Left Turn	Green/White	SBLT
4- Southbound	Green	SB
5- Eastbound Left Turn	Orange/White	EBLT
6- Eastbound	Orange	EB
7- Westbound Left Turn	Blue/White	WBLT
8- Westbound	Blue	WB
9- Pedestrian	Yellow	PED

NOTE: This is a typical cable schedule and shall be used for the wiring of all signal installations. A new cable schedule will be noted on the plans at each intersection where different phasing and/or special equipment is required. It should be noted that a band of white is used to indicate a left turn and yellow for a pedestrian movement. This is in addition to directional tape for the phase. For cable size and number of conductors, see Traffic Signal Material Specifications and/or Standard Drawings.

In subsection 614.10 (b) delete the seventh paragraph and replace with the following:

In no case shall any shellac compounds be used. All connections shall be wire nut connectors. Connections shall be DIAPERED and sealed with non-conducting silicone at all splices. Splices in underground systems shall be waterproofed. A minimum of 12 inches of slack shall be left at each splice except within handholes where 24 inches shall be left.

Subsection 614.10 (c) shall include the following:

Interconnect cable shall be grounded only at one end. Bonding and grounding jumpers shall be solid copper wire, #6 AWG for all systems.

The ground electrode shall be driven into the ground so as the top is 2 inches above the bottom of the pull box. The ground rod connector will be placed so that the bare solid copper wire (#6) can be pulled into a pole, pedestal, or attached to the control cabinet ground buss.

Subsection 614.10 (d) shall include the following:

Excavations, other than for conduit, shall be backfilled with Structure Backfill (Class 1). The surface of the backfill material will be placed to the bottom of the pavement repair or to 6 inches below surface in unpaved areas. The final layer of material will be identical to the material surrounding the backfilled section.

When excavations must remain open overnight, they shall be properly marked to warn motorists and/or pedestrians according to the most recent revision of Part VI in the "Manual on Uniform Traffic Control Devices for Streets and Highways".

Subsection 614.10 (e) shall include the following:

All foundations shall be Portland cement concrete, class BZ.

The exposed portions shall be formed with "Sonotube" to present a neat appearance. Sonotube forms shall not extend below finished grade more than 1 foot.

Precast traffic signal pole footings shall be installed in drilled holes, with tamped sand backfill material. Precast signal footings are not to be used with poles with mast arms.

Anchor bolts shall conform to the specifications of the manufacturer of the poles and mast arms and each individual bolt shall have 2 flat washers, 1 lock washer and 2 nuts. Shims or other similar devices for plumbing or raking will not be permitted. Threaded portions of the anchor bolts shall be protected from contamination with concrete or other damage.

Forms shall not be removed until the concrete has thoroughly set.

Any abandoned foundation shall be removed to 18 inches below finish sub-grade and disposed of by the contractor. Any conduit runs associated with an abandoned foundation shall be extended or abandoned as called for on the plans. When a foundation is removed, the hole shall be backfilled in accordance with subsection 614.10 (d).

Subsection 614.10 (f) shall include the following:

Each individual detector loop is to be terminated within a pull box or water valve housing as specified on the construction drawings and each loop shall consist of one continuous wire, without splicing, to this termination point. Any required series or parallel connections are to be at the termination point.

Detector loops are to be constructed using DETECTADUCT 14 gauge one conductor IMSA Spec #51-5. The loop run shall go through the water valve pull box unspliced to the Quazite pull box located off the roadway. Canoga lead in wire between the Quazite box and the controller cabinet shall be continuous through intermediate pull boxes without splices. All field wires shall be tagged and color coded with permanent markings in the cabinet.

All loops shall have a tag attached to the leading clockwise lead of the loop. This tag shall be marked to indicate the relative location of the loop. This marking shall correspond directly to the loop designations on the intersection drawing provided in the contract.

Detector loop roadway slots shall be sealed to the surface level of the original roadway with 3M Loop Sealant or approved equal. This sealant is to be used whether or not the roadway is to be overlaid.

All presence detector loops shall be quadrapole type, dimensioned as shown on the plans or located in the field, and shall be installed with 2-4-2 turns.

Subsection 614.10 (j) shall include the following:

The contractor shall have full maintenance responsibility of the traffic signal installation from the date of the written Notice to Proceed to the Final Inspection and written approval of the work performed under the contract.

Prior to the functional test, the system shall be operated on flash for 7 calendar days.

The functional test for each traffic signal system shall consist of not less than 14 calendar days of continuous, satisfactory operation.

During the seven day signal flash time and the fourteen day functional test period, the contractor will maintain the system or systems. The cost of any maintenance necessary, except electrical energy, shall be borne by the contractor and will be considered as included in the price paid for the contract items involved and no additional compensation will be allowed therefore.

In subsection 614.10 (j) 4. change all time period references from 5 days to 14 days.

Add subsections 614.10 (k) – (n) as follows:

(k) *Conduits.* All metal conduit referred to in the specifications and shown on the plans shall be rigid and adequately galvanized, or approved equal. All PVC conduit will be of schedule 80 or heavier. Galvanized rigid conduit shall be used only for installations above grade.

All signal cable conduit shall be not less than 3 inches inside diameter. Conduit for low voltage conductor (pedestrian and vehicle detector) shall not be less than 2 inches inside diameter. Conduit between power pole and controller cabinet used for Xcel Energy feed and interconnect cable (where not supplied by Xcel Energy) shall be 2 inches inside diameter.

The contractor, at his sole expense, may use larger conduit if desired. Where larger conduit is used, it shall be for the entire length of the run from outlet. No reducing couplings will be permitted underground.

The ends of all metal conduit, existing or new, shall be well reamed to remove burrs and rough edges. Ends shall be capped or otherwise closed off until cable is pulled. Field cuts of existing or new conduit shall be made square and true, and the ends shall butt together for the full circumference thereof. Slip joints of running thread will not be permitted for coupling metal conduit. When a standard coupling cannot be used, an approved threaded union coupling shall be used. All couplings shall be screwed up until the ends of the metal conduits are brought together. Joints for PVC pipe shall be cut square and true and the ends shall butt together for the full circumference. All Joints shall be solvent welded unless otherwise approved. Slip joints may be used to joint two separate runs of conduit.

Where a "stub-out" is called for on the plans, a sweeping "ell" shall be installed in the direction indicated and properly capped. The ends of all conduits in structures or terminating at curbs shall be marked by a "Y" at least 3 inches high, cut into the face of the curb, gutter or wall directly above the conduit.

Conduit bends, except factory bends, shall have a radius of not less than 6 times the inside diameter of the conduit. Where factory bends are not used, conduit shall be bent without crimping or flattening, using the longest radius practical.

Conduit shall be laid at a depth of not less than 24 inches below the curb gutter grade in the sidewalk areas and to a depth of not less than 24 inches below the finished sub-grade in all other areas. Conduit under railroad tracks shall be not less than 48 inches below the bottom of the tie or as directed by the owning railroad company.

Trench excavations for conduit shall be 2 inches wider than the outside diameter of the conduit. Backfilling of conduit trenches shall be accomplished by placing Structure Backfill (flowfill) up to the bottom surface of the roadway pavement material. The remaining portion of the excavation shall be backfilled with the same type of

material used to construct the existing roadway surface. Care shall be taken during placement of multiple conduit runs in one trench to ensure Structure Backfill (flowfill) completely surrounds the conduit.

Conduit shall always enter a pedestal base, pull box, or any other type structure from the direction of the run only.

Conduit terminating in a standard or pedestal shall extend approximately 2 inches above foundation vertically. The conduit shall be installed in such a way that it will slope toward the handhole opening.

All conduit runs that exceed 10 feet in length shall have a continuous 1/4 inch diameter nylon line pulled into the conduit along with the specified electrical cables. The line shall be firmly secured at each end of the conduit run with a minimum slack of 3 feet. The purpose of this line is to be able to pull future electrical cable through the existing conduit runs.

Existing underground conduit to be incorporated into a new system shall be cleaned with a mandrel or blown out with compressed air.

New conduit runs shown on the plans are for bidding purposes only and may be changed with approval of or as directed by the Project Engineer.

All conduit connections at pull boxes shall be tightly secured and waterproofed. Conduit entering controller cabinets shall be sealed by the use of paraffin or other approved sealing compound or as directed by the engineer.

- (l) *Pull Boxes.* A pull box shall always be installed in combination with a steel strain pole and at all other locations shown on the plans and at such additional points as ordered by the engineer. The contractor may install, at his own expense, any additional pull box he may desire in order to facilitate the work and as approved by the engineer.

Special pull boxes and extensions which are required shall be fabricated and installed in general conformance with the size and details shown on standard drawings.

Pull boxes installed in finished areas shall be designed for such installations and shall be stackable and manufactured of a pre-cast polymer concrete material such as Quazite or an approved equal. Pull boxes shall be installed so that the covers are level with curb or sidewalk grade or level with the surrounding ground when no grade is established. The bottoms of all pull boxes shall be bedded in six (6) inches of crushed rock.

When a new conduit run enters an existing pull box, the Contractor shall remove the pull box or tunnel under the side at no less than 18 inches and enter from the direction of the run. No new conduit will be allowed to enter a new or existing pull box in any other manner than that shown on the standard drawings.

Traffic valve pull boxes installed in the street shall be placed according to the plans or as directed by the engineer. The lids shall have the word "Traffic" cast into them.

New pull boxes will not be paid for separately, but shall be included in the cost of conduit.

- (m) *Controller and Cabinet.* A controller shall consist of a complete electrical mechanism for controlling the operation of traffic control signals, including the timing mechanism and all necessary auxiliary equipment.

Each control cabinet shall be mounted on a concrete base as shown on the drawings. All electrical conduits running to the control cabinet shall enter from the bottom. No holes shall be drilled in any part of the cabinet other than the bottom unless otherwise called for on the drawings.

All controller cabinets and control equipment shall be factory wired, ready for operation; field work will be limited to placing cabinets and equipment and the connecting of field wiring to field to field terminal strips. All cabinet wiring shall be neat and firm and all harness and cabinet wiring shall be brought out to a backboard and terminated.

The model and/or serial number shall appear on the controller and cabinet. All auxiliary equipment shall be of the most current design.

At the Contractor's request, the Project Engineer will provide, during the construction period, an additional external lock for the controller cabinet to maintain security of the controller cabinet.

Flashing operation shall be set for flashing yellow on main street approaches and flashing red on all other approaches in accordance with the "Manual on Uniform Traffic Control Devices". The flashing mechanism shall remain operational during removal of the controller.

(n) *Traffic Signals and Mast Arms.* Traffic signal heads requiring backboards shall be drilled for rivets or self tapping screws. If the manufacturer fails to supply as described, it will be the contractor's responsibility to do so.

Mast arm brackets shall be Astro Brackets or the equivalent and shall be installed 90 degrees to the roadway.

Subsection 614.13 shall include the following:

Traffic signs will be measured by unit including all materials included in the steel sign post and sign panel and other work necessary to complete the item.

Traffic loops will be measured by unit including all materials and other work to complete the item.

Pedestrian flashing sign assemblies will be measured by the unit including the two sign assemblies, conduit and cables, pedestrian push buttons, solar panels, batteries and chargers, and all other materials and work to complete this item.

Radar speed display signs will be measured by the unit including the cabinets, displays, radar unit, solar panels, battery and charger, and all other materials and work to complete the item.

Subsection 614.14 shall include the following:

<b>Pay Item</b>	<b>Pay Unit</b>
Traffic Sign	Each
Traffic Loop	Each
Pedestrian Flashing Sign Assembly	Each
Radar Speed Display Sign	Each

Add subsections 614.15 – 614.16 as follows:

**614.15 Sign Illumination or Illuminated Signs.** (Added subsection)

The pedestrian flashing sign consists of two school crosswalk warning assemblies located at each end of the crosswalk. Each assembly consists of a S1-1 with 5 LED lights located at the corners of the sign and a supplemental panel W16-7p below the main sign panel.

The flashing LED lights will be the latest generation high intensity yellow colored LEDs. The lights will be pedestrian actuated with a pedestrian push button that conforms to the requirements of subsection 614.08 (f). Both assemblies will be actuated from either push button on each end of the crosswalk. The lights will flash for 45 seconds after actuation.

The sign shall be solar powered with an 80 watt solar panel, backup battery, and charger mounted on the pole with the sign. The pole will be a 14 foot long aluminum pole with a minimum outside diameter of 4 ½ inches, base, collar, and all other mounting hardware included.

**614.16 Radar Speed Display Signs.** (Added subsection)

The radar speed display sign consists of a pole mounted radar sign with a 0.125 inch thick welded aluminum cabinet, white powder coat paint inside and out, a shielded display with a smoked, non-glare finish that is readable in direct sunlight, a K-band single directional radar unit, and a “Your Speed” sign above the display.

The characters will be 18” high full matrix (rounded) LED lights will be the latest generation high intensity yellow colored LEDs. The lights will have automatic intensity adjustment for ambient light conditions. In addition to the “Your Speed” characters, the sign shall also include “Slow Down” and red/blue flashing bars violator alerts.

The sign shall be solar powered with an 80 watt solar panel, backup battery, and charger mounted on the pole with the sign. The pole will be a 14 foot long aluminum pole with a minimum outside diameter of 4 ½ inches, base, collar, and all other mounting hardware included.

**REVISION OF SECTION 627  
PAVEMENT MARKING**

Section 627 of the CDOT Standard Specifications is hereby revised for this project as follows:

Subsection 627.02 shall include the following:

Pavement marking material shall be paint and pre-formed plastic conforming to the requirements of Section 708 and 713 respectively. Contractor shall submit product data for approval by the Engineer.

Subsection 627.08 shall include the following:

Application of pre-formed plastic pavement marking materials shall be in accordance with the manufacturer's written specifications. Contractor shall submit manufacturer's pavement surface preparation and application specifications, for each type of marking material, for approval by the Engineer.

Pre-formed plastic pavement marking materials shall be inlaid into fresh pavement when the pavement temperature is between 135 degrees and 150 degrees.

Delete subsection 627.12 (e) and replace with the following:

(e) Pavement word and symbol markings, transverse and longitudinal crosswalk lines, and stop lines will not be measured, but shall be the number of symbols placed or the linear feet of tape, color and width as specified, placed.

Subsection 627.13 shall include the following:

<b>Pay Item</b>	<b>Pay Unit</b>
Epoxy Pavement Marking	Linear Foot
Preformed Pavement Marking (Handicap)	Each
Preformed Pavement Marking (Type – ____ SF)	Each

**REVISION OF SECTION 630  
CONSTRUCTION ZONE TRAFFIC CONTROL**

Section 630 of the CDOT Standard Specifications is hereby revised for this project as follows:

Subsection 630.10 shall include the following:

If the Contract Documents do not include a Traffic Control Plan (TCP), the Contractor shall submit a method for handling traffic (MHT). The MHT must utilize the Manual on Uniform Traffic Control Devices (MUTCD) or Standard Plans S-630-1 and S-630-2 for devices that are proposed. Approval of the MHT does not relieve the Contractor of traffic control liability specifically assigned to him under this Contract. A copy of the approved MHT shall be available at the project site at all times in order that City of Wheat Ridge personnel may verify compliance with the specified traffic control requirements.

The Contractor's MHT shall also include the following:

- (1) The number of flag persons to be used.
- (2) The number of authorized 24-hour days a traffic control supervisor will be required.

The Contractor shall erect and maintain warning lights, signs, barricades and sufficient safeguards around all excavations, embankments and obstructions.

Subsection 630.13 shall include the following:

The Contractor shall provide an inventory of all existing pavement marking to be disturbed to the Engineer prior to beginning work.

All warning and construction zone traffic control devices shall bear the name, address and phone number of the barricade company that owns them. The phone number shall be a 24 hour a day dispatched hot line in the event an emergency situation occurs where additional devices are needed or existing devices must be removed.

The Contractor shall install construction zone traffic control devices in locations where they do not block or impede sidewalks for pedestrians, disabled persons, bicyclists or other existing traffic control devices. A minimum four foot wide, unobstructed sidewalk area is to be maintained where possible. In the event that a minimum four foot wide sidewalk area with a minimum overhead clearance of 7 feet 6 inches cannot be maintained, a pedestrian/bicycle detour plan shall be submitted in conjunction with the traffic control plan.

All existing traffic control devices including traffic signals, signs, and pavement markings that are compatible with the construction zone traffic control shall remain visible and fully operational. If these devices are incompatible with the temporary construction, they shall be covered, relocated or removed.

Whenever the Contractor removes, obliterates or covers in any way, any pavement markings including lane lines and crosswalks, he shall replace them on a daily basis. Prior to opening affected areas to traffic, all pavement marking shall be placed in accordance with the Plans and Specifications or as directed by the Engineer.

The Contractor shall equip all vehicles operating within the moving lanes with flashing amber lights visible from all directions.

Subsection 630.15 shall include the following:

Signs, barricades, traffic channelizing devices, flashing beacons (portable), method of handling traffic, traffic control supervisor, flagging, and all other requirements of Subsection 630 are included in the pay item for Traffic Control Management unless they are identified in the Bid Schedule as separate pay items.

Subsection 630.16 shall include the following:

No payment will be made under Section 630 until the method of handling traffic (MHT) has been submitted and accepted.

<b>Pay Item</b>	<b>Pay Unit</b>
Traffic Control Management	Lump Sum

**REVISION OF SECTION 703  
AGGREGATES**

Section 703 of the CDOT Standard Specifications is hereby revised for this project as follows:

Subsection 703.04 shall include the following:

The weight of lime shall be included in the total weight of the material passing the No. 200 sieve.

**REVISION OF SECTION 713  
TRAFFIC CONTROL MATERIALS**

Section 713 of the CDOT Standard Specifications is hereby revised for this project as follows:

Delete subsection 713.08 and replace with the following:

**713.08. Preformed Plastic Material.** Pre-formed plastic pavement marking material shall be the following or equal:

<u>Surface</u>	<u>Brand</u>	<u>Series</u>	<u>Product</u>
Concrete	3M Stamark	A	420
Asphalt	3M Stamark	A	5730

**SECTION 720  
MATERIALS SAMPLING AND TESTING**

Section 720 is hereby added for this project as follows:

**DESCRIPTION**

**720.01** Materials sampling and testing shall be performed under the Contract by an independent materials testing company. This work shall include all necessary labor, equipment and material required for sampling and testing materials or finished products in accordance with the specifications of this section. Unless otherwise designated, all referenced specifications, standards or policies shall be the latest edition as revised or updated by approved supplements published and issued prior to the date of the advertisement for bids

**CONSTRUCTION REQUIREMENTS**

**720.02** All materials sampling and testing shall be performed by certified, experienced and qualified materials testing technicians who work under the supervision of a registered professional engineer in the State of Colorado, practicing in this field. At the request of the Engineer, the Contractor shall require the materials testing company to replace any technician who cannot satisfactorily perform the testing duties.

**720.03** All materials sampling and testing equipment shall be serviceable and have been currently calibrated. At the request of the Engineer, the Contractor shall require the materials testing company to replace any testing equipment that is not satisfactory.

**720.04** Retesting the density of subgrade and base course materials shall be required at the Contractor's expense, if they are reworked or weather causes the materials to become wet, dry or frozen.

**720.05** Materials testing technicians shall furnish copies of failed test results to the Engineer within two working days of completion of testing and prior to the next construction phase. On a weekly basis, the Contractor shall furnish the Engineer with copies of all test results taken during that week and a cover letter, signed by the supervising registered professional engineer, which summarizes the results and discusses any failed tests or inconsistencies.

**720.06** The City of Wheat Ridge materials testing requirements are provided in Table 720-1. All testing procedures, point of verification and central lab requirements shall be as specified in the Frequency Guide Schedule of the Colorado Department of Transportation Field Materials Manual. Without increasing the total number of tests or samples required, the Project Engineer or Inspector may change the test locations from the frequency spacing shown in Table 720-1. One test is required for any fraction of the specified frequency.

**Table 720-1  
City of Wheat Ridge Materials Testing Requirements**

<b>Type of Test</b>	<b>Frequency</b>	<b>Remarks</b>
Soil Survey (Classification), AASHTO M 145	1 per 500 feet of roadway or pipe trench	Surveys for roadway and trench may be combined
Moisture-Density Curve, AASHTO T 99	1 per on-site soil type 1 per import material source	AASHTO method determined by soil or materials type
Embankment in-place density, Colorado Procedures	1 per 250 feet per lane per 6 inch loose lift	Minimum density per soil classification, Section 203.07
Roadway subgrade in-place density, Colorado Procedures	1 per 250 feet per lane	Minimum density per soil classification, Section 203.07
Sidewalk subgrade in-place density, Colorado Procedures	1 per 250 feet of sidewalk	Minimum density per soil classification, Section 203.07
Pipe trench in-place density, Colorado Procedures	1 per 200 feet of trench per 18 inch vertical interval	Minimum density per soil classification, Section 203.07
Aggregate base course in-place density, Colorado Procedures	1 per 250 feet per lane	Minimum 95% of maximum density, T 180
Lime treated subgrade in-place density, Colorado Procedures	1 per 250 feet per lane	No less than 95% of standard dry density and optimum moisture, T99
Cement treated base in place density, Colorado Procedures	1 per 250 feet per lane	Density in accordance with contract documents, T 134
Hot Bituminous Pavement asphalt content and gradation	1 per 1000 tons	Within specifications of approved mix design: Binder PG 64-22
Hot Bituminous Pavement in-place density, Colorado Procedures	1 per 100 tons	92 - 96% of maximum density, T 209
Concrete compressive strength, AASHTO Procedures	1 set per 50 cubic yards	PCC pavement, structural concrete, sidewalks, and curbing
Concrete air content and slump, AASHTO Procedures	1 per 25 cubic yards	PCC pavement, structural concrete, sidewalks, and curbing

**BASIS OF PAYMENT**

**720.07** Payments for materials sampling and testing will be lump sum.